

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

**RESOURCES MANAGEMENT PLAN
AND FINAL ENVIRONMENTAL IMPACT STATEMENT
FOR
IMPROVEMENT OF WATER QUALITY
AND CONSERVATION OF RARE SPECIES AND THEIR HABITATS
ON SANTA ROSA ISLAND**

CHANNEL ISLANDS NATIONAL PARK
Santa Barbara County, California

This plan proposes actions to 1) improve water quality in surface streams and protect riparian habitat areas on Santa Rosa Island, and 2) promote the conservation and recovery of rare species¹ of plants and animals on Santa Rosa, as well as the habitats upon which they depend.

Description of the Action: The proposed action would improve water quality, protect riparian habitat areas, and conserve rare species and their habitats on Santa Rosa Island by phased reduction of cattle grazing and commercial hunting over the next 14 years. Proposed actions include the immediate closure of Old Ranch and Carrington pastures to cattle and horses, and rapid phased reduction of grazing in other pastures with resources at risk (Pocket Field and North pastures). Cattle exclosures would be built to protect riparian areas in Jolla Vieja Canyon (South Pasture) and Box Springs (Wire Field Pasture). Deer would be removed from the island by the year 2000, and elk would be reduced gradually over the next 14 years. The Park would implement road management actions to reduce impacts to island streams, and will develop a comprehensive weed management plan to address problems due to alien plant species. The Park would develop monitoring programs for rare species, water quality and riparian recovery. Visitor access to Santa Rosa Island would be increased beyond current levels.

Summary of Environmental Impacts: The proposed actions would improve water quality and riparian areas in three of the island's pastures. Water quality and riparian areas in other pastures would improve as grazing in those pastures is scaled back. Water quality would be improved rapidly in 12 of the island's 18 second order streams, and would improve gradually in the other six. Five proposed plant species would be protected from grazing by the pasture closures, and removal of deer would reduce browsing pressure on five proposed plant species and on chaparral, coastal sage scrub, and woodland habitats. The phased reduction of cattle grazing would allow the Park to implement control strategies for alien plants. Mitigation measures would be implemented to prevent possible impacts to archeological sites from construction of exclosures.

Alternatives Considered: A) No Action; B) Minimal Action; C) Targeted Management Action; D) Revised Conservation Strategy (the Proposed Action); and E) Immediate Removal of Ungulates.

¹ "Rare species" includes species which have been **proposed** for listing as threatened or endangered under the Endangered Species Act, those species which are **candidates** for such listing, and those which have been identified as **species of concern** by the National Park Service.

A period of no action on the part of the Department of Interior, National Park Service will end 30 days following the publication in the Federal Register of a Notice of Availability of the final environmental impact statement. Following this no action period, The National Park Service will publish a Record of Decision to implement the proposed action.

Inquiries on the Final RMP/EIS and requests for copies should be directed to Channel Islands National Park, 1901 Spinnaker Drive, Ventura, CA 93001, or by telephone at (805) 658-5776.

Figure 1. Channel Islands National Park, in southern California.

SUMMARY

This *Final Resources Management Plan and Environmental Impact Statement* proposes measures to mitigate the adverse effects of ungulates on water quality, riparian areas, rare plants and habitats on Santa Rosa Island, Channel Islands National Park, Santa Barbara County, California. These actions will be implemented to improve island surface waters, and to promote the conservation and recovery of rare species and the habitats upon which they depend.

Santa Rosa Island was purchased in 1986 from members of the Vail family and the Vickers Company. The Vail family and the Vickers Company operated a ranch on the island since the turn of the century. As a condition of sale, Vail & Vickers reserved a right of residential, noncommercial use and occupancy for the developed ranch complex (approximately 8 acres) for 25 years from the date of sale. The ranch operation is authorized under a Special Use Permit. The NPS Organic Act states that the NPS may allow grazing within units of the National Park System provided that the use is not detrimental to the primary purpose for which the park was established by Congress. In parks where NPS authorizes ranching pursuant to this law, the NPS issues a Special Use Permit for the activity. The issuance of permits is based on criteria found in various NPS regulations and policies. Pursuant to these laws and regulations, the NPS issued a five-year, revocable Special Use Permit to Vail & Vickers in 1993. The current permit will be replaced with a revised Special Use Permit that incorporates the management actions contained in the RMP alternative that is ultimately selected by NPS in the Record of Decision on this plan. The NPS has notified Vail & Vickers that their existing permit will be superseded by the issuance of this new permit. NPS anticipates that the new permit will go into effect soon after the Record of Decision is issued.

A Development Concept Plan for Santa Rosa Island was written in 1995 to guide development of support facilities and visitor use facilities on the island in the interim.

In 1995, several actions occurred which required development of management actions to address water quality and rare plant conservation on Santa Rosa Island. First, the U.S. Fish and Wildlife Service (FWS) proposed that 10 plant taxa which currently or historically occur on Santa Rosa be listed as Endangered under the provisions of the Endangered Species Act, as part of a listing package for the northern Channel Islands. In 1995, the Park and FWS also established an interagency conservation team to assess the status of and make recommendations for conservation of species which were candidates for the Federal list of threatened and endangered species. Second, the Central Coast Regional Water Quality Control Board issued a Cleanup or Abatement Order to the Park, directing NPS to abate range and road management practices which degrade water quality on Santa Rosa Island.

Alternatives Considered in this Draft RMP/EIS include: A. No Action; B. Minimal Action; C. Targeted Management Action; D. Revised Conservation Strategy (The Proposed Action); and E. Immediate Removal of Ungulates.

Alternative A, No Action, is the continuance of the status quo. Under this alternative, NPS would take no action to improve water quality or riparian values, or to promote the conservation of rare species, beyond those actions which have been taken already. Livestock and game species would be managed as they currently are. Cattle would continue to graze under a continuous use

system, and use of riparian areas would continue to be heavy at times. The weed management program would be increased as funding allows, in order to address weed management problems on Santa Rosa Island. All grazing and hunt operations would cease by 2011. Effects of ungulates on water quality, riparian areas, rare plants and habitats would continue at current levels until cattle grazing ceases in 2011.

Alternative B, Minimal Action, is the implementation of management actions least likely to affect operations of the grazing and hunting permittee, but that would achieve moderate improvement in water quality in three pastures, and in six of the island's 16 streams. This would be accomplished by the immediate closure of Old Ranch Pasture to cattle use, and the construction of small riparian exclosures (20 to 80 acres in size) in drainages in three other pastures. The exclosures would protect about 0.75 miles, or 20% of Arlington Canyon riparian corridor, and 0.75 miles, or 30% of the Canada Tecolote riparian corridor. Grazing and browsing pressure on some rare plants and habitats would be reduced by the closure of Old Ranch Pasture and the removal of the island's deer herd over a five year period. The weed management program would be increased as funding allows, in order to address ongoing and future weed problems on Santa Rosa Island. Although water quality, riparian areas, and vegetation would improve in Old Ranch Pasture and in the small riparian exclosures, the cattle would continue to have access to the majority of the island's streams. Mitigation would be required to prevent damage to archeological sites from fencing construction. The NPS operation would be slightly affected by this alternative. The permittee's operation would be slightly affected by this alternative.

Alternative C, Targeted Management Action, is the implementation of a combination of management actions intended to achieve significant improvement in water quality in two pastures, and in eight of the island's 16 streams. This would be accomplished by the closure of Old Ranch Pasture to cattle and horses, and the implementation of rotational grazing in North Pasture. The latter would be split by construction of a fence along the Smith Highway, and the riparian areas in the lowland areas (Brockway Pasture) would not be grazed during the hot season. To facilitate summer grazing in the upland portion of North (Black Mountain Pasture), three water developments would be constructed. Water quality improvement would be significant in Old Ranch Pasture, and would be significant in Brockway if higher seasonal stocking rates do not hinder recovery of riparian vegetation. Cattle would continue to have access to the island's other riparian areas. Grazing and browsing pressure on some rare plants and habitats would be reduced by the closure of Old Ranch Pasture and the removal of the island's deer herd over a three year period, as well as the reduction in the island's elk herd from 1100 to 450 animals. Small riparian exclosures would be used as restoration tools and to protect key riparian resources. Residual Dry Matter (RDM) standards would be raised to protect upland areas. The weed management program would be increased as funding allows, in order to address ongoing and future weed problems on Santa Rosa Island. Mitigation would be required to prevent damage to archeological sites from fencing and water development construction. The NPS operation would be moderately affected by this alternative. The permittee's operation would be moderately affected by this alternative.

Alternative D, Revised Conservation Strategy, will improve water quality, protect riparian habitat areas, and conserve rare species and their habitats on Santa Rosa Island by phased reduction of cattle grazing and commercial hunting over the next 14 years. This alternative was formed by modifying the management recommendations proposed by the interagency Conservation Strategies Team, as a result of their work on a conservation strategy for candidate

and proposed species on the northern Channel Islands (Coonan et al. 1996). Their recommendations were revised to reflect comments received on the Draft RMP/EIS.

Proposed actions include the immediate closure of Old Ranch and Carrington pastures to cattle and horses, and rapid phased reduction of grazing in other pastures with resources at risk (Pocket Field and North pastures). Cattle exclosures would be built to protect riparian areas in Jolla Vieja Canyon (South Pasture) and Box Springs (Wire Field Pasture). Deer would be removed from the island within four years, and elk would be reduced gradually over the next 14 years. The Park would implement road management actions to reduce impacts to island streams, and would develop a comprehensive weed management plan to address exotic species' problems. The Park would develop monitoring programs for rare species, water quality and riparian recovery. Visitor access to Santa Rosa Island would be increased beyond current levels.

Implementation of these actions would gradually remove the influence of non-native ungulates from the island's natural systems, thus allowing these systems to begin recovery from the perturbations caused by historic and current grazing and browsing. This would allow the re-establishment of natural ecosystem processes such as nutrient cycling and fire, and would allow NPS to cope with any problems arising from removal (such as changes in the distribution of weedy species). The relatively quick reduction of deer is prescribed due to the disproportionate influence that deer exert on sensitive biological communities and rare species. Reduction of livestock stocking level in certain areas is rapid in order to confer immediate protection on rare species and native plant communities and to initiate recovery of systems, and to achieve rapid recovery of riparian function and improvement of water quality. The NPS operation would be moderately affected by this alternative. Effects on the permittee would likely be more severe than the impacts of Alternative C.

Alternative E, Immediate Removal of Ungulates, would require the permittee to remove all livestock, including cattle, horses, deer, and elk, from Santa Rosa Island within three years. This would allow for rapid recovery of riparian areas and improvement in water quality in all drainages, and would remove all grazing and browsing pressure from rare plant species and their habitats. Several species of weeds which are currently being controlled by grazing would probably spread in extent. The weed management program would be increased as funding allows. The NPS operation would be moderately affected by this alternative. Effects on the permittee would be heavy.

Table 1. Summary of alternatives for Resources Management Plan, Santa Rosa Island.

ELEMENT	ALTERNATIVE A NO ACTION	ALTERNATIVE B MINIMAL ACTION	ALTERNATIVE C TARGETED MANAGEMENT ACTION	ALTERNATIVE D REVISED CONSERV. STRATEGY	ALTERNATIVE E IMMEDIATE REMOVAL
Pastures Targeted for Management Actions	none	Old Ranch North Pocket Field	Old Ranch North	Old Ranch North South Pocket Field Carrington Wire Field	All
Pasture Closures	none	Old Ranch closed to cattle	Old Ranch closed to cattle and horses	Old Ranch (1997) Carrington (1998) Pocket Field (2000) North (2008)	All
Small Riparian Exclosures	none	Are primary tool to improve water quality and riparian areas. 3 each in 5 drainages in North, South and Pocket Field	Are restoration tools, for protection of key resources and establishment of nursery areas. 1 each in 9 drainages in Pocket Field, North, South, and Wire Field	Jolla Vieja (South Pasture) Box Canyon (Wire Field)	none
Removal of Deer	no	within 5 years	within 3 years	by 2000	within 3 years
Reduction of Elk Herd	no	no	Reduced to 450 within 3 years	Phased out over 14 years	Removal within 3 years
Rotational Grazing	no	no	Seasonal grazing rotation implemented between two pastures created by dividing North into Brockway (cool season) and Black Mountain (warm season). Riparian areas in Brockway protected from summer grazing.	no	No

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Changes in Grazing Management	none	none	Minimum Residual Dry Matter (RDM) raised from 400 to 1000 lb./ac	Pasture stocking set by phaseout schedule and monitored by monthly reporting of head-days	Not applicable
Weed Management	Expanded Program	Expanded Program	Expanded Program	Minimum RDM raised from 400 to 1000 lb./ac, but used only to adjust stocking rates in drought years Expanded Program focused on pastures with reduced stocking levels	Expanded Program
Management Action in 2011	Rapid removal of all ungulates islandwide	Rapid removal of all ungulates islandwide	Rapid removal of all ungulates from 95% of the island	Remove last 60 elk and last cattle	Continue island restoration programs
Monitoring	Current program: Residual Dry Matter (RDM) monitoring for range management, monthly water quality monitoring in 3 drainages.	Same as under No Action	Range monitoring is the same as under previous alternatives. Annual monitoring of water quality and riparian areas in targeted pastures	Water quality monitoring changed to track recovery of water quality values and riparian function. Add rare plant monitoring.	No range monitoring after three years. Quarterly water quality monitoring in targeted and untargeted pastures. Annual monitoring of riparian areas.

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Mitigation Required	Not applicable	Mitigation required for possible adverse effects to archeological sites from fence construction for small riparian exclosures. Oversight required for deer removal. Other mitigation measures may be identified during consultation with USFWS regarding impacts to proposed and listed species.	In addition to mitigation required under Minimal Action, also required for possible adverse effects of fence construction and water development construction on archeological sites. Other mitigation measures may be identified during consultation with USFWS regarding impacts to proposed and listed species.	Mitigation required for possible adverse effects of riparian exclosure construction on archeological sites. Oversight required for deer and elk removal program. Park will comply with terms and conditions of recommended by RWQCB for water quality certification for road stream crossing maintenance. Other mitigation measures may be identified during consultation with USFWS regarding impacts to proposed and listed species.	Oversight required for removal program. Other mitigation measures may be identified during consultation with USFWS regarding impacts to proposed and listed species.

Table 2. Summary of impacts associated with alternatives for Resources Management Plan, Santa Rosa Island.

IMPACT TOPIC	ALTERNATIVE A NO ACTION	ALTERNATIVE B MINIMAL ACTION	ALTERNATIVE C TARGETED MANAGEMENT ACTION	ALTERNATIVE D REVISED CONSERV. STRATEGY	ALTERNATIVE E IMMEDIATE REMOVAL
Soils	Where cattle trail and concentrate, there will be continued heavy effects of trampling on soil, causing decreased soil stability, increased erosion and soil loss, and decreased water availability for plants. Impacts will be eliminated when grazing ends in 2011.	Same as under No Action, except that removal of cattle from Old Ranch will result in decreased trampling of soils, increased soil stability, and increased water availability for vascular plants in that pasture.	Same as under Minimal action, except that increase of Residual Dry Matter (RDM) standards from 400 to 1000 lb./ac will confer some protection to upland soils. Local erosion could increase near water sources in Black Mountain and Brockway Pastures, due to increased seasonal stocking density.	Impacts to soils will be gradually eliminated, and stabilization and recovery of those soils should commence on significantly greater areas of the island as pastures are phased out of grazing	Impacts to soils will be reduced and then eliminated, and stabilization and recovery of those soils should subsequently occur. There will thus be decreased trampling of soils islandwide, resulting in increased soil stability.
Water Quality and Riparian Areas	Continued heavy effects on most streams. With no streams except a portion of Lobo protected, riparian vegetation will be nonexistent, stream banks will remain unstable, and erosion will continue. Most streams will remain non-functional in ability to trap sediment. Sediment levels will remain high during storm events. Water quality will remain low, with high coliform levels from cattle fecal inputs.	Up to 20% of the riparian corridor in Arlington Canyon and 30% in Canada Tecolote would be protected by exclosures from year-long grazing. In areas where cattle are excluded (Old Ranch Pasture and the small riparian exclosures), riparian vegetation will recover, stream banks will stabilize, and water quality will improve. Water quality may also improve for a short distance downstream of riparian exclosures. Still, the majority of streams will remain unprotected from grazing, and effects will be as described under No Action.	Effects from closure of Old Ranch Pasture and construction of small riparian exclosures would be the same as described under Minimal Action. Riparian areas and water quality in Brockway Pasture may improve, due to protection from grazing during the hot season. Summer seasonal grazing in Black Mountain Pasture may impact riparian areas and cause a decline of water quality in that pasture. Most streams in South and Pocket Field Pastures will remain unprotected from the effects of grazing.	Effects from closure of Old Ranch Pasture would be the same as described under previous alternatives. Riparian areas and water quality in closed pastures will improve significantly, and progressively, as grazing is phased out on a greater proportion of the island. Water quality and riparian areas in Pocket Field will improve significantly when the pasture is closed to grazing in 2000. Reduction of stocking levels in North Pasture to 25% of current level will improve water quality and riparian function. Jolla Vieja and Box Springs will be protected by exclosures.	Complete removal of ungulates would remove all grazing impacts to riparian areas. Some restoration may still be required to restore some elements of native riparian vegetation. Increase in vegetative cover would facilitate stabilization of streambanks, sediment would be trapped, and streams would become functional riparian areas. Cattle fecal input to riparian areas would cease, and water quality would improve in all drainages.

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Vegetation Communities	<p>Maintaining the current ranch and Park operations would continue present heavy effects on vegetation communities. Shrub communities will continue to be impacted by grazing, and chaparral and coastal sage scrub communities will be limited in range by grazing. Chaparral will continue to be heavily browsed by deer. Annual grassland will continue to dominate the island. Impacts will diminish after grazing is removed in 2011.</p>	<p>Removal of cattle from Old Ranch Pasture will allow recovery of shrub communities in that pasture. Construction of small riparian exclosures will have positive but limited effects on vegetation. Removal of deer will facilitate recovery of chaparral, woodland and shrub communities.</p> <p>Otherwise, effects on vegetation will be as described under No Action.</p>	<p>Increased stocking density in Black Mountain Pasture may impact chaparral and woodland communities in that pasture, though this may be mitigated by the 1000 lb./ac RDM standard. Concentration of livestock around water development in Cherry Canyon may impact chaparral and woodland communities.</p> <p>Increase in RDM standards and reduction of elk will have generally beneficial effects on vegetation. Otherwise, effects on vegetation will be as described under Minimal action.</p>	<p>Rapid reduction of deer and the gradual phaseout of elk and cattle will remove grazing and browsing pressure on vegetation. In response to the removal of grazing pressure, native vegetation would increase in plant size, density, and areal extent, with significant reproduction and recruitment. Riparian, shrub, chaparral and woodland communities would begin recovering from the effects of grazing and browsing, with increases in understory, litter, and age/size class diversity. Recovery of native perennial grasslands will be slow and may require active restoration efforts. Microphytic crust will recover, enhancing moisture and nutrient availability to plants.</p>	<p>Effects will be the same as described under Revised Conservation Strategy, but recovery of native plants and vegetation communities would be more rapid.</p>

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Weeds	Current weed trends are likely to continue. Cattle are likely to increase the spread of most weed species. Thistle populations are likely to continue to increase, fennel is likely to continue to be controlled through grazing. Incremental increases in the weed management program will provide opportunities to prevent the spread of weeds to new locations as well as to eradicate current populations. Weeds may increase after grazing is removed in 2011.	NPS will be able to address weed problems that may arise from the removal of cattle from Old Ranch Pasture. Though there are currently heavy thistle infestations in that pasture, removal of cattle may not affect them, because cattle do not feed on these prickly species, and are thus not currently controlling them. Otherwise, effects on weeds will be as described under No Action.	Effects on weeds will be as described under Minimal action, except that thistle populations will establish near water developments. Additionally, the increase in RDM may reduce establishment of weeds due to lack of bare ground for seedling establishment.	Gradual reduction of cattle will remove a source of disturbance and weed dispersal. Weed populations may initially increase in closed pastures. Fennel plants may be released from control by grazing, leading to expansion of fennel on the island. Black mustard and wild radish may also increase at first.	Same as described under Revised Conservation Strategy.
Wildlife	Moderate effects would continue. Wildlife populations would continue at or near current levels, though species currently at low population levels be at risk of extirpation. Impacts will diminish once grazing is removed in 2011.	Wildlife will benefit from removal of cattle from Old Ranch Pasture, due to habitat recovery. Construction of small riparian exclosures will have positive but limited effects on wildlife. Otherwise, effects on wildlife will be as described under No Action.	Increase in RDM will be generally beneficial to wildlife. The split of North Pasture and implementation of seasonal grazing will have undetermined effects on wildlife, depending on direction of vegetation change. Water developments may be used by wildlife. Otherwise, effects on wildlife will be as described under Minimal action.	Wildlife will generally benefit from increased vegetation cover and forage resources as vegetation recovers as pastures are closed and grazing is phased out	The removal of all ungulates will significantly improve habitat values for wildlife. Recovery of vegetation following removal will increase cover and forage resources for wildlife.

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Rare Species (Listed, Proposed, and Candidate Species)	Heavy effects on rare species would continue. Rare plant populations and their habitats would continue to be subject to the direct effects of grazing, browsing, and trampling by cattle, deer, and elk, as well as to the indirect effects of soil erosion, weed and other alien plant competition, and pollinator loss. Cumulative effects include the loss of habitat, reduction in population size, and lack of reproductive vigor which will prevent re-establishment and long-term viability for sensitive plant populations	Removal of cattle from Old Ranch Pasture will remove grazing threats to 4 plant species proposed for listing as Endangered. Removal of deer will remove browsing pressure from 5 proposed species, and will allow recovery of habitats for those species.	Effects on rare species and their habitats are the same as under Minimal action, except for the following. Rare plant species islandwide may benefit from the increase in RDM and the reduction of elk. Increased stocking density in Black Mountain Pasture may impact rare plant species in chaparral and woodland habitats.	Grazing pressure on rare plant populations will be significantly reduced and eventually eliminated in closed pastures, and in pastures where stocking levels have been reduced. These effects will occur over a progressively greater proportion of the island over time, as pastures are closed and grazing is phased out. The removal of deer and gradual reduction of elk will greatly reduce browsing and grazing pressure on rare plant species. Closure of pastures to grazing will allow NPS to use prescribed fire to restore habitat for rare species.	All grazing and browsing pressure on rare plants, and their habitats, will cease. This will facilitate recovery of all rare plant populations.

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Archeological Resources	<p>Moderate effects would continue. Cattle will continue to graze on most archeological sites with attendant damage. Erosion will continue to disrupt cultural materials at current levels of impact.</p> <p>Burials would continue to erode at their present rate. Elements introduced after European contact will be present on the island.</p>	<p>Closure of Old Ranch would eliminate cattle impact to the archeological sites in this area, which could include the remains of the first island ranch structures.</p> <p>Construction of fenced riparian exclosures could damage archeological sites. However, impacts could be reduced by careful siting of the fence line and construction and storage areas, with appropriate monitoring of the construction process.</p> <p>Removal of cattle from the Old Ranch pasture would return a more traditional appearance to a portion of the island. Reduction of erosion should reduce the rate at which burials are exposed. Historic Chumash villages in the Old Ranch pasture would be less impacted by erosion.</p>	<p>Same as under Minimal action, except that a decrease in the elk population would decrease the minimal impact of elk on archeological sites. Vehicular traffic associated with the elk hunt would continue to offer the potential to impact archeological sites.</p>	<p>Phased removal of non-native ungulates would decrease direct trampling of archeological sites and add further protection from erosion in closed pastures.</p> <p>The removal of non-native ungulates will reduce erosion and the rate at which burials are exposed. Preservation of European contact villages would be enhanced.</p>	<p>Removal of all ungulates will have significant, positive effects on cultural resources. All direct trampling of archeological sites will cease, and vegetation recovery will decrease the adverse effects of erosion on sites.</p> <p>Measures which will reduce erosion will slow the rate at which prehistoric burials are exposed and will present a setting more closely resembling the traditional appearance of the islands before European contact.</p>
Historical Resources	<p>There would be no effect on historic structures or the surrounding historic landscape preservation area.</p>	<p>There would be no effect on historic structures or the surrounding historic landscape preservation area.</p>	<p>There would be no effect on historic structures or the surrounding historic landscape preservation area.</p>	<p>There would be no effect on historic structures or the surrounding historic landscape preservation area.</p>	<p>There would be no effect on historic structures or the surrounding historic landscape preservation area.</p>

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Cultural Landscape	There would be no effect on the existing cultural landscape.	Within Old Ranch Pasture, the removal of cattle would replace the current cultural landscape with a landscape more nearly resembling the prehistoric cultural landscape. The remainder of the cultural landscape would be substantially unaffected, except that construction of exclosures would clutter the existing cultural landscape with modern fencing.	Same as described under Minimal Action.	Removal of non-native ungulates would alter the present cultural landscape from one displaying the characteristics of a rural ranch to one more nearly displaying the appearance of the prehistoric landscape.	The landscape which will evolve from this action will more closely resemble the prehistoric cultural landscape in all areas of the island except the historic landscape preservation area centered upon the Beecher's Bay Ranch.

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Visitor Use	No direct effects on visitor use. Current restrictions on visitor use will continue: reduced access during the elk hunt, required NPS escort in backcountry, etc. Under No Action, aesthetics of the island may decline over time (erosion on slopes, etc.), further impacting the visitor's experience.	Visitor access to Old Ranch Pasture may increase. Deer removal operations may reduce visitor access on island. Removal of deer may cause recovery of shrub communities, thus improving the island aesthetics. However, some visitors may miss viewing the deer. Construction of small riparian exclosures will have negligible effects on visitor use.	<p>The split of North Pasture and implementation of seasonal grazing may have both positive (recovery of Brockway riparian areas) and negative (increased stocking density, additional fence, impacts to Black Mountain riparian areas) effects on the visitor experience.</p> <p>Raising the RDM level may enhance the visitor experience, since no pasture would appear overgrazed.</p> <p>Otherwise, effects are as described under Minimal action.</p> <p>During the elk and deer reduction, some areas may be temporarily closed to visitor access for reasons of public safety.</p>	Progressive recovery of riparian areas and upland habitats in closed pastures and as grazing is phased out may enhance the visitor experience. There will be expanded visitor access to the island. The requirement for Ranger escort will be eliminated for most visitor travel.	There may be increased opportunities for recreation on the island following the removal of all ungulates in three years. Visitor access to parts of the island may increase. Recovery of riparian areas and vegetation communities may enhance the visitor experience.

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Permittee	No effects on ranch operations.	Closure of Old Ranch would reduce island grazing capacity by 7%, and may decrease ranch profits. Ranch would lose revenue from deer portion of annual hunt, and would incur the costs of deer removal prior to 2011. The permittee would bear the costs of construction of small riparian exclosures.	In addition to effects described under Minimal action, the permittee would bear the costs of elk reduction, and would have to adjust ranch operations to implement seasonal grazing in the split North Pasture. The permittee would bear the costs of construction of small riparian exclosures. Raising the minimum RDM level could impact ranch operations during drought years, when forage production is lower.	Ranch would lose revenue from deer portion of annual hunt, and would incur the costs of deer removal prior to 2011. The permittee would bear the costs of elk reduction, and would lose profits due to a reduced elk hunt later in the phaseout period. Each pasture closure and subsequent reduction in islandwide grazing capacity would have commensurate effects on ranch profits. Grazing capacity would be reduced 50% four years after implementation of this plan. The permittee would bear the costs of construction of small riparian exclosures.	Complete removal of ungulates would have substantial effects on the permittee. Future revenue from grazing and hunting operations would be lost, and the permittee would bear the cost of removing all stock from the island prior to 2011.
NPS	No effects on Park operations, beyond costs of an expanded weed management program.	The Park would bear cost of construction of riparian exclosures, removal of exclosure fencing in 2011, and expanded weed management program. The Park would lose revenue from grazing fees from cattle in Old Ranch Canyon.	Same as described under Minimal action, except that the Park would also bear the costs of construction of the fence dividing North Pasture and costs for construction of water developments in Black Mountain Pasture, as well as the cost of removing those structures once grazing ceases in 2011.	Park loses revenue from grazing fees, as pastures are closed. Costs of weed management may be less overall, due to phased removal of grazing. NPS will bear costs of restoration and weed management prior to 2011.	The Park would lose revenue from grazing fees, once livestock is removed. Park may incur significant costs of weed management program required to control weeds released by removal of grazing.

IMPACT TOPIC	ALTERNATIVE A NO ACTION	ALTERNATIVE B MINIMAL ACTION	ALTERNATIVE C TARGETED MANAGEMENT ACTION	ALTERNATIVE D REVISED CONSERV. STRATEGY	ALTERNATIVE E IMMEDIATE REMOVAL
Wilderness	Santa Rosa Island will remain unsuitable for wilderness designation until sometime after 2011, when grazing has been removed and restoration completed.	Same as described under No Action.	Same as described under No Action.	Wilderness values may be improved somewhat in that wilderness suitability will be improved in closed pastures, as recovery occurs. Restoration efforts will be completed 3-15 years earlier than in previous alternatives. wilderness designation.	Wilderness values may be improved. Wilderness suitability of island will improve after all grazing is removed, and all restoration is completed. Under this alternative, restoration efforts may be completed 10-15 years earlier than in all other alternatives.

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PURPOSE AND NEED

The purpose of this resources management plan for Santa Rosa Island is 1) to conserve and restore rare plant and animal species, as well as their habitats upon which they depend; 2) to ensure that non-native plant species will not threaten restoration of rare species and their habitats; and 3) to ensure that management of non-native ungulates (e.g., cattle, deer, elk, horses) and island infrastructure (e.g., roads and culverts) will protect or recover riparian habitat and water quality sufficiently to ensure compliance with the Clean Water Act.

INTRODUCTION

National Park Service Management of the Channel Islands began in 1938 with the establishment of Channel Islands National Monument, which included Anacapa and Santa Barbara Islands. Public Law 96-199 (March 5, 1980) redesignated the Monument as a National Park and added San Miguel, Santa Rosa, and Santa Cruz Islands to the unit. The latter two islands were privately owned, and the park's enabling legislation contained provisions for acquisition of lands within the newly designated Park boundaries.

In 1986 the National Park Service (NPS) purchased Santa Rosa Island from the Vail & Vickers Company, which had operated a cattle ranch on the island since the turn of the century. As part of the purchase agreement, Vail & Vickers retained a right of noncommercial use and occupancy for the Beecher's Bay ranch house site (approximately 8 acres) for 25 years from the date of purchase. Additionally, the Park's enabling legislation allows NPS the discretion to lease or permit the former owners to continue existing uses of the island that are compatible with the administration of the Park and the protection of its resources. Under this provision, NPS permits Vail & Vickers to continue operation of a cattle ranch and commercial hunt operation on Santa Rosa Island, through a revocable Special Use Permit (SUP) renewable every five years. Under a range management plan developed for Santa Rosa Island (Bartolome and Clawson 1992), stocking rates are adjusted via residual dry matter (RDM) monitoring in upland sites.

NEED FOR THE ACTION

The need for this plan results from recently discovered water quality problems and threats to rare species on Santa Rosa Island.

Water Quality

On August 18, 1995 the Central Coast Regional Water Quality Control Board issued a Cleanup or Abatement Order (CAO 95-064) to Channel Islands National Park directing the Park to take measures which would improve water quality on Santa Rosa Island. Although the Park has filed an appeal with the California State Water Resources Control Board, asking that the CAO be rescinded and replaced with a memorandum of agreement, the Park has agreed to implement various interim actions to improve water quality.

PURPOSE AND NEED

The Park had previously documented high fecal coliform and pH levels in Santa Rosa streams, as part of the Park's inventory of water resources on that island (Sellgren 1995). The Cleanup or Abatement Order stated that the Park was in violation of the Water Quality Control Plan for the Central Coast Basin, due to current range and road management practices which allow the discharge of bacteria and sediment into the surface waters of Santa Rosa Island. Specifically, the Order directed the Park to:

- 1) abate rangeland and road management practices which degrade riparian habitat, degrade water quality, and induce sediment transport into surface waters of Santa Rosa Island;
- 2) submit to the Board by January 1, 1996, a report containing temporary plans and measures to clean up and restore areas impacted by current rangeland and road management practices, and to implement said plan by February 1, 1996; and
- 3) submit to the Board by June 1, 1996, a report containing final implementation plans and a time schedule for implementation actions.

A letter from the Board to the Park on December 22, 1995, amended the CAO by dropping the requirement to submit a report containing temporary plans and mitigation measures to the Board by January 1, 1996. Instead, the Park was required to submit a draft plan for mitigation and restoration by March 15, 1996. However, the recent shutdown of the federal government has delayed the development of mitigating plans by NPS. Consequently, the Board approved an extension of the deadline for submitting a plan. The Park will present a draft plan to the Board by April 30 and a final plan, following public review of the draft, by August 1, 1996.

Rare Species and Their Habitats

As in other island ecosystems, the northern Channel Islands flora and fauna include many endemic species, which occur only on one or more of the Channel Islands. Due to low population sizes and various threats, many of these endemic species have either been designated as endangered or threatened under the Endangered Species Act, or are candidates for such listing. Management agencies have recently begun to recognize the threats to such species, and have begun to address the long-term conservation requirements for listed and candidate plants and animals, implementing measures intended to manage rare species in an ecosystem context. For the purposes of this plan, the term *rare species* refers to species which have been proposed for listing as endangered under the Endangered Species Act, or species which the U.S. Fish and Wildlife Service (FWS) has identified as candidates for such listing.

National Park Service managers have clear responsibilities under the Endangered Species Act for species listed as threatened or endangered. Additionally, NPS management policies (NPS 1988) direct park managers to promote the conservation and recovery of species which are candidates for the federal list of threatened and endangered species. In September, 1994, NPS began working jointly with FWS on development of a conservation agreement for management of candidate species on the northern Channel Islands. A team of biologists from both agencies has

PURPOSE AND NEED

recently assessed the status of candidate species as well as the habitats on which they depend, and has developed ecological standards for recovery of species and habitats, as well as conservation measures to achieve recovery (Coonan et al. 1996).

On July 25, 1995, FWS proposed endangered status for 16 plant taxa from the northern Channel Islands. Included in this proposal were 10 plant species which currently occur or historically occurred on Santa Rosa Island. In their listing proposal, FWS identified such threats to these taxa as soil loss, habitat alteration and predation caused by cattle grazing and elk and deer browsing, competition with alien plant taxa, and vulnerability to random extinction by storm, drought, or fire. Although these taxa have not yet been listed as endangered, NPS is required to confer with USFWS regarding potential actions which may affect these taxa.

Conclusion

This comprehensive Resources Management Plan attempts to integrate protection of water quality, riparian communities, and rare species and their habitats on Santa Rosa Island. This plan is accompanied by an Environmental Impact Statement. The EIS will address all long term impacts of proposed and alternative management actions.

GUIDELINES FOR MANAGEMENT

Guidance for development of this plan is found in various laws, NPS management policies and guidelines, and previous park planning efforts. The following is a discussion of the influence of such factors on various subjects relevant to the development of this plan.

Acquisition of Santa Rosa Island

The enabling legislation for the Park (PL 96-199, March 5, 1980) addresses the acquisition and management of Santa Rosa Island, directing the Secretary of the Interior to acquire the island as soon as possible following establishment of the Park. Santa Rosa Island was subsequently acquired from the Vail & Vickers Company on December 29, 1986, for \$29.5 million. All of the 54,000 acre island was acquired in fee simple title with the exception of the 8 acre ranch complex at Beecher's Bay. Vail & Vickers reserved a 25-year right of noncommercial use and occupancy for the 8 acre ranch complex. This right of use and occupancy ends on December 29, 2011.

The Park's enabling legislation authorized, as part of the acquisition of private property, that the owner could reserve a right of use and occupancy. This was not reserved by the former owner. Further, the act allowed the Secretary to enter into a lease agreement with the former owner under which the former owner could continue any existing use of such property, provided the use was compatible with the administration of the park and with the preservation of the resources therein. No lease has been entered into. The National Park Service did permit Vail & Vickers to continue cattle and game ranching via a revocable Special Use Permit (SUP). The two successive permits issued to date each have had a 5 year duration, the maximum allowed under NPS policy.

Guidance for Natural and Cultural Resources Management

Because the issues of natural and cultural resources management on Santa Rosa Island were raised during the scoping sessions for this EIS process, the following is a summary of the laws and NPS policies which guide resources management at Channel Islands National Park, as in other NPS units.

The 1916 NPS Organic Act, (16 USC 1 et seq.) directed that NPS lands be managed to conserve the resources contained within “in such manner and by such means as will leave them unimpaired for the enjoyment of future generations.” The Redwoods Act of 1978 (16 USC 1a-1) reaffirmed this principle. In general, these two statutes confer upon the Secretary of the Interior the discretion to determine how best to protect and preserve park resources.

Since the establishment of Yellowstone National Park in 1872 and the subsequent founding of the National Park Service in 1916, the philosophy of natural resources management has gradually evolved from such simple concepts as protection from poaching to the complexities of comprehensive ecosystem management in a regional and global context (NPCA 1989).

In 1961, the Secretary of the Interior convened a blue-ribbon panel to evaluate how NPS should manage large mammals and other animals. The resultant report (Leopold et al. 1963) clearly directed NPS toward *ecosystem management*, which is the management of all components of an ecosystem as a whole, rather than single-species management. The Leopold Commission promoted the notion that national parks should be managed as “vignettes of primitive America” in order to preserve, to the extent possible, the biota that existed or would have evolved had European humans not colonized North America. Although this has been interpreted by some as a call for “hands-off” management of a static primitive condition or scene, the Leopold Commission actually promoted an aggressive stewardship of parklands with “hands-on” management techniques, and perpetuation of dynamic, evolving ecosystems. For example, the report called for restoration of natural fire regimes in parks.

More recent work has built upon the findings of the Leopold Commission regarding resources management in NPS units. Parsons et al. (1986) state that the principal aim of National Park Service resource management in natural areas is the unimpeded interaction of native ecosystem processes and structural elements. Parks should protect not only structural elements such as plants, animals, soil, water and air, but also dynamic ecosystem processes such as natural fire and nutrient cycling.

In 1989, NPS convened a blue ribbon panel to assess the role of resource management and research in the future of the national parks. The resulting report (NPCA 1989) validated the findings of the Leopold Commission, affirming that the focus of park management should be to maintain or restore native biota and ecosystems and to resist establishment of alien organisms. Where possible, ecosystem management should attempt to preserve natural processes operating at a scale consistent with the evolution of the ecosystem being managed. The report recommended that NPS move well beyond static scene management to provide stewardship for the elements and processes contained in parks.

PURPOSE AND NEED

National Park Service management policies (NPS 1988) reflect the development of ecosystem management concepts. In part, the policies state that natural resources should be managed with a concern for fundamental ecological processes as well as for individual species and features:

Managers and resource specialists will not attempt solely to preserve individual species (except threatened or endangered species) or individual natural processes; rather, they will try to maintain all the components and processes of naturally evolving park ecosystems, including the natural abundance, diversity and ecological integrity of the plants and animals.
(Ch. 4:1)

National Park Service management of cultural resources seeks to preserve and foster appreciation of the cultural resources in NPS' custody through appropriate programs of research, treatment, protection, and interpretation (NPS 1988). Guidance for cultural resources management in NPS units is found in National Park Service Management Policies (1988) and Cultural Resource Management Guidelines (NPS-28). Management of cultural resources in NPS units is subject to the provisions of the National Historic Preservation Act (16 USC 470 et seq.), the National Environmental Policy Act (42 USC 4371 et seq.), the American Indian Religious Freedom Act (42 USC 1996), the Advisory Council on Historic Preservation's regulation regarding "Protection of Historic Properties" (36 CFR 800), the Secretary of the Interior's "Standards and Guidelines for Archeology and Historic Preservation (FR 48:44716-40) and "Federal Agency Responsibilities under Section 110 of the National Historic Preservation Act" (FR 53:4727-46).

Significant Santa Rosa Island cultural resources identified by the Park's general management plan (NPS 1985) include sites related to 19th century marine mammal hunting, structures associated with ranching operations, archeological sites related to prehistoric and historic occupation of the islands, abandoned military sites, and submerged cultural resources, such as shipwrecks. The GMP states that, upon acquisition of Santa Rosa Island, NPS would conduct adequate research programs and would provide for the preservation, restoration, protection, interpretation, use, study, and management of significant cultural resources. These actions would include:

- inventory of cultural sites;
- nomination of appropriate cultural resources to the National Register of Historic Places;
- evaluation of and appropriate listing of aboveground historic or archeological structures to the List of Classified Structures, an internal NPS list that assists park managers in planning and programming.
- preservation, where possible, of existing exterior features of historic structure;
- preparation of a historic structure report and preservation guide for each property or complex of related historic properties.

Management of Water Quality Values and Riparian Resources

The federal Clean Water Act includes a limited waiver of sovereign immunity which requires federal agencies to comply with certain federal, state and local laws and regulations relating to water quality. In California, water quality is managed by the California State Water Resources

PURPOSE AND NEED

Control Board. The Regional Water Quality Control Board for Santa Rosa Island is the Central Coast Region. In 1989, the Board published water quality standards and criteria for surface waters in Santa Barbara County, in the Water Quality Control Plan for the Central Coast Region (commonly referred to as the “Basin Plan”) (Regional Water Quality Control Board, Central Coast Region 1989). The Basin Plan for the Central Coast Region assigned beneficial uses and water quality objectives for coastal waters off Santa Rosa Island (as well as San Miguel and Santa Rosa Islands), but did not address surface waters on any of the islands. In a 1994 amendment to the Basin Plan, the Board identified nine specific surface waters on Santa Rosa Island (Canada Lobos, Old Ranch Canyon, Arlington Canyon, Water Canyon, Cow Canyon, Clapp Springs, Old Ranch Canyon Estuary, Old Ranch House Canyon, and Cherry Canyon) and assigned to them beneficial uses, to be protected (Table 3, Table 4). The Park, however, was never specifically informed of the ability to comment on the designation of beneficial uses for Park waters.

According to the Basin Plan, streams which have not specifically been assigned beneficial uses have “implied beneficial use designations for protection of both recreation and aquatic life”, though the Basin Plan does not state that specific beneficial uses are implied for these unnamed waters.

PURPOSE AND NEED

Table 3. Beneficial uses¹ assigned to water bodies on Santa Rosa Island (from 1994 amendment to 1989 Water Quality Control Plan, Central Coast Region).

Water body	MUN	AGR	RE1	RE2	WIL	WAR	BIOL	RAR	EST	FRE	COM
Canada Lobos Creek	X	X	X	X	X	X	X	X			X
Old Ranch Canyon Creek	X	X	X	X	X	X	X	X			X
Arlington Canyon Creek	X	X	X	X	X	X	X	X			X
Water Canyon Creek	X	X	X	X	X	X	X	X			X
Cow Canyon Creek	X	X	X	X	X	X	X	X			X
Clapp Springs	X	X	X	X	X	X	X	X			X
Old Ranch Canyon Creek Estuaries		X	X	X	X	X	X	X	X		X
Old Ranch House Canyon Creek	X	X	X	X	X	X	X	X		X	X
Cherry Canyon Creek	X	X	X	X	X	X	X	X			X

- ¹MUN Municipal and Domestic Supply
 AGR Agricultural Supply
 RE1 Water Contact Recreation (REC-1)
 RE2 Non-Contact Water Recreation (REC-2)
 WIL Wildlife Habitat
 WAR Warm Freshwater Habitat
 BIOL Preservation of Biological Habitats of Special Significance
 RAR Rare, Threatened, or Endangered Species
 EST Estuarine Habitat
 FRE Freshwater Replenishment
 COM Commercial and Sportfishing

PURPOSE AND NEED

Table 4. Definitions of beneficial uses assigned to Santa Rosa water bodies (from 1989 Water Quality Control Plan, Central Coast Region).

Beneficial Use	Description
Municipal and Domestic Supply	Uses of water for community, military or individual water supply systems including, but not limited to, drinking water supply.
Agricultural Supply	Uses of water for farming, horticulture or ranching including, but not limited to, irrigation, stock watering, or support of vegetation for range grazing.
Water Contact Recreation (REC1)	Uses of water for recreational activities involving body contact with water, where ingestion of water is reasonably possible. These include, but are not limited to, swimming, wading, water skiing, skin and scuba diving, surfing, white water activities, fishing, or use of natural hot springs.
Non Contact Water Recreation (REC2)	Uses of water for recreational activities involving proximity to water, but not normally involving body contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to picnicking, sunbathing, hiking, beachcombing, camping, boating, tidepool and marine life study, hunting, sightseeing, or aesthetic enjoyment in conjunction with the above activities
Wildlife Habitat	Uses of water that support terrestrial ecosystems including, but not limited to, preservation and enhancement of terrestrial habitats, vegetation, wildlife (e.g., mammals, birds, reptiles, amphibians, invertebrates), or wildlife water and food sources.
Warm Freshwater Habitat	Uses of water that support warm water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife, including invertebrates.
Preservation of Biological Habitats of Special Significance	Uses of water that support designated areas or habitats, such as established refuges, parks, sanctuaries, ecological reserves, or Areas of Special Biological Significance (ASBS), where the preservation or enhancement of natural resources requires special protection.
Rare, Threatened or Endangered Species	Uses of water that support habitats necessary, at least in part, for the survival and successful maintenance of plant or animal species established under state or federal law as rare, threatened, or endangered.
Estuarine Habitat	Uses of water that support estuarine ecosystems including, but not limited to, preservation or enhancement of estuarine habitats, vegetation, fish, shellfish, or wildlife (e.g., estuarine mammals, waterfowl, shorebirds).

PURPOSE AND NEED

Beneficial Use	Description
Freshwater Replenishment	Uses of water for natural or artificial maintenance of surface water quantity or quality (e.g, salinity) which includes a water body that supplies water to a different type of water body, such as, streams that supply reservoirs and lakes, or estuaries.
Commercial and Sportfishing	Uses of water for commercial or recreational collection of fish, shellfish, or other organisms including, but not limited to, uses involving organisms intended for human consumption or bait purposes.

Management of Rare Species and Their Habitats

Guidelines for management of species federally listed as threatened , endangered or candidates for listing are found in NPS management policies and natural resources management guidelines. National Park Service management policies (NPS 1988) and guidelines for natural resources management (1991) establish the affirmative responsibility of NPS, and the individual park, for managing both listed and candidate species. They also stress that management actions should emphasize removal of threats, but also include active recovery efforts, and that management should be done in an ecosystem context.

In addition, the Endangered Species Act requires that actions authorized, funded, or carried out by Federal agencies not jeopardize the continued existence of listed species. It also requires that Federal agencies use their authorities to further the purposes of the Endangered Species Act, including the conservation of listed species.

Under section 7(a)(2) of the ESA (16 U.S.C. Section 1536), Federal agencies are required to consult with the U.S. Fish and Wildlife Service (USFWS) on actions which may affect listed species or critical habitat. If a Federal agency determines that its actions may adversely affect a listed species or critical habitat, the Federal agency requests formal consultation with the Service, and submits a description of the proposed action, identification of any listed species which may be affected, and a description of the likely effects on those species. The USFWS then prepares a biological opinion, which states the opinion of the USFWS as to whether the proposed Federal action is likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of critical habitat.

There are currently no listed plant species on Santa Rosa Island. Wildlife species listed as threatened or endangered include the peregrine falcon, brown pelican, and western snowy plover. In 1994, NPS prepared a biological assessment which evaluated the effects of park activities on the western snowy plover and brown pelican, and submitted a request to USFWS to initiate formal consultation. The USFWS subsequently issued a biological opinion in 1995 that required NPS to take actions to protect plovers and pelicans from effects of Park authorized activities. In accordance with the Biological Opinion, NPS has implemented actions to protect plovers and pelicans (see section on Rare Species in Affected Environment).

PURPOSE AND NEED

In regard to species proposed for listing, section 7(a)(4) of the Endangered Species Act requires Federal agencies to confer with USFWS on any action that is likely to jeopardize the continued existence of those species. A conference is a procedure intended to assist the agency in identifying and resolving potential conflicts early in the planning process. During the conference, the USFWS will make advisory recommendations on ways to minimize or avoid adverse impacts. If the proposed species is subsequently listed, the Federal agency must review the action to determine if formal consultation under Section 7(a)(2) is required.

Because the proposed actions in this Resources Management Plan concern 10 plant taxa which USFWS has proposed for listing as endangered, NPS will confer with USFWS on likely effects of these actions on those species.

Park Planning Documents

In addition to the guidance provided by Servicewide guidelines, management of National Park Service units is guided by planning documents developed specifically for each unit. *General management plans* are broad, long-range strategies for development and management of parks. Other, more specific plans tier off of general management plans. These include *resources management plans*, which address natural and/or cultural resources management issues in parks, and *development concept plans*, which address facilities development for specific sites or areas.

Planning efforts for Santa Rosa Island were begun prior to its acquisition by NPS in 1986, and have gradually evolved since NPS began management of the island. Early planning efforts treated future development of Santa Rosa Island very generally. The Park's general management plan (NPS 1980, 1985) contained a very broad conceptual plan for Santa Rosa Island, leaving specifics to future plans to be developed following acquisition. The only specific treatment thus far is the recently completed Development Concept Plan for Santa Rosa Island (NPS 1995), which addresses facility development to serve management and visitor needs in the near future. A future amendment to the Park's general management plan will address long-term development plans for the island. Although resources management plans are generally developed subsequent to general management plans, recent concerns regarding the management of water quality and rare species and their habitats precipitated development of this plan prior to amendment of the current GMP.

The Park's general management plan (NPS 1980, 1985) generally addressed management of Santa Rosa Island following anticipated acquisition by NPS. The plan assumed full ownership by NPS without continued ranching by Vail & Vickers, though the plan stated that most of the proposals could be implemented with minor variations, even if the owners wished to continue ranching. The plan stated that, at the main ranch complex at Becher's Bay, the buildings, cultivated fields and pastures would be preserved as a historic ranching scene. The plan envisioned continuation of cattle and horse grazing in this area, as part of the interpretive program. In contrast to the cultural emphasis at Becher's Bay, the general management plan stated that the island's backcountry, over 95% of the land area, would be managed primarily as a natural area (the entire island was designated as both a natural and a cultural zone). Alien animal species were to be removed, and vegetation would be allowed to return to presumably natural conditions (those existing prior to the influence of European humans).

PURPOSE AND NEED

Long term planning for NPS management of Santa Rosa Island will be addressed in a future addendum to the Park’s GMP, which will speak to the broader issues of NPS management following termination of grazing in 2011. A recently completed development concept plan for Santa Rosa (NPS 1995) addressed development of support facilities and visitor use on Santa Rosa in the near future. The DCP outlines an expanded NPS operation on that island and addresses various aspects of such an operation. Regarding natural and cultural resources management, the DCP calls for a resources management plan to be developed (this document), which would expand on existing resources management goals of inventorying island ecosystems, studying the effects of grazing on such, implementation of limited restoration in some areas, and expansion of the Park’s ecosystem management program to the island. The DCP also calls for studies of cultural resources, including cultural landscapes, and development of appropriate National Register nominations. The DCP also addresses access for visitors, appropriate visitor activities, the construction of housing and administrative facilities, and attendant staffing and cost estimates.

PLAN GOALS AND OBJECTIVES

The goals of this resources management plan for Santa Rosa Island are:

1. to conserve and restore rare plant and animal species, as well as they habitats upon which they depend;
2. to ensure that non-native plant species will not threaten restoration of rare species and their habitats;
3. to ensure that management of non-native ungulates (e.g., cattle, deer, elk, horses) and island infrastructure (e.g., roads and culverts) will protect or recover riparian habitat and water quality.

To achieve the above goals, the following objectives must be met.

Rare Species

For each of the proposed species, the following will be achieved:

- Evidence of successful reproductive effort.
- Recruitment occurring within a majority of population units.
- Increase in total numbers of individuals and in proportion of appropriate habitat occupied.

Habitat Types

For each habitat type which has been impacted by historic and recent grazing and on which rare species depend (chaparral, coastal sage scrub, lupine scrub, mixed woodlands, island oak woodlands, Bishop pine, Torrey pine, riparian, coastal wetlands):

PURPOSE AND NEED

- Achieve a natural increase in the extent of the habitat type.
- Increase cover and diversity of native species.
- Decrease frequency and diversity of alien plant species.
- Increase recruitment and reproduction of sensitive plant species.
- Recover vegetation structure sufficiently to allow fire to play its natural role.
- Achieve vegetative cover across the community sufficient to reduce sedimentation to streams and hold precipitation in soils.

Water Quality

The Cleanup or Abatement Order identified problems with sediment transport and bacteria in island waters, in regard to water quality objectives for contact recreation and warm water habitat. Since management measures on Santa Rosa Island are best implemented on a pasture by pasture basis, the various alternatives being considered approach water quality management in this fashion. Therefore, in pastures and selected streams targeted for mitigation, management actions will attempt to meet the following objective:

- Significant improvement in bacteria and pH levels, as compared to current baseline levels.

Riparian Areas

- Riparian areas in targeted pastures will be able to function as riparian areas (will be in properly functioning condition), or will exhibit recovery toward functional status.
- Riparian areas in targeted pastures will have increased canopy cover and increased cover and diversity of desirable species, both woody and herbaceous.

ALTERNATIVES

The following elements are common to all five alternatives being considered.

Expanded weed management program

The existing weed management program is comprised of volunteer removal efforts coordinated by Park personnel. Under all alternatives, the weed management program would be increased as funding allows, in order to address weed management problems on Santa Rosa Island (see Appendix A).

Road management

Best management practices for road management would continue to be implemented. The Park is currently applying to U.S. Army Corps of Engineers for a permit to cover such practices.

Termination of Commercial Grazing and Hunting and Subsequent Management of Santa Rosa Island

The current general management plan (GMP) for the Park will be amended to identify more specific actions to be taken following termination of grazing. According to the current GMP, the island's backcountry, or about 95% of the island, will be managed as a natural area, whereas the main ranch complex, buildings, and associated cultivated pastures in the Beecher's Bay area will be preserved as a historic scene. And although commercial grazing of Santa Rosa will cease in 2011, the general management plan directs that a small number of cattle and horses be allowed to stay in small pastures in the Beecher's Bay area as part of a demonstration ranch, in order to interpret to the public the history of ranching on Santa Rosa Island. The number of livestock and the size of these demonstration pastures will be determined by a historic resources management plan for the Beecher's Bay area, which will more comprehensively address its preservation as a cultural scene.

Prior to 2011, the Park will conduct a historic structures study and a cultural landscape study for Santa Rosa Island, and will develop appropriate plans. The Park is currently developing a nomination of Santa Rosa Island to the National Registry of Historic Places.

ALTERNATIVE A. NO ACTION

Pastures Targeted For Management Actions: None

Under this alternative, NPS would take no action to improve water quality or riparian values, or to promote the conservation of rare species, beyond those actions which have been taken already.

Livestock and game species would be managed as they currently are. Cattle would continue to graze under a continuous use system, with no management actions taken to improve distribution of cattle; use of riparian areas would continue to be heavy at times, during the hot season. Stocking rate would be adjusted via monitoring of residual dry matter (RDM) in pastures, with cattle being removed when RDM falls below critical values.

Elk and deer would also be managed as they currently are. The current maximum number of deer allowed is 1000, whereas there is no maximum for elk.

Existing cattle exclosures would be maintained. These include fenced populations of Hoffmann's gilia and munchkin dudleya in Old Ranch Pasture (approximately 10 acres), the Soledad island oak grove (approximately 2 acres), the Lobo Canyon exclosure (approximately 100 acres), and the plover exclosure on Skunk Point. The exclosures are built to exclude cattle, but do not exclude deer or elk.

Under this alternative, the weed management program would be increased as funding allows, in order to address weed management problems on Santa Rosa Island. A comprehensive weed management program would need to be in place by 2011, when cattle, deer and elk would be abruptly removed from the island.

Best management practices for road management would continue to be implemented under permit from U.S. Army Corps of Engineers.

Resource monitoring would be maintained at existing levels: spring and fall RDM monitoring for range management, and monthly water quality monitoring in three streams.

Under this alternative, all grazing and hunt operations would cease by 2011. There are currently no plans for a phaseout of grazing or hunt operations, though the logistics of removing all stock by 2011 may dictate that the permittee begin phasing out operations prior to that time.

- Arlington
- Verde
- Soledad
- Water

Exact size, shape and location of each enclosure would be determined on site by an interdisciplinary team. The 15 enclosures would protect from 300 to 1200 acres of riparian corridor. Since each enclosure requires 0.75 to 1.5 miles of fence, 15 SISTLE's would require 12 to 23 miles of fence. Enclosure fencing would be removed upon termination of commercial grazing in 2011.

Active restoration efforts may need to be implemented in SISTLE's, if native seed sources are not present. These efforts may include revegetation along streambanks with wouldow, baccharis and cottonwood, from cuttings or seed collection/propagation, as required. Restoration efforts would be implemented in at least one SISTLE in each drainage.

Table 5. Location of SISTLE's on Santa Rosa Island, under Alternative B.

Drainage	Pasture	Number of SISTLEs	Location	Purpose
Arlington Canyon	South	1	in South Pasture	Restoration nursery
	Pocket Field	2	in Pocket Field	Restoration
Canada Verde	North	3	To be determined	Restoration
Water Canyon	North	2	Near lower corral	Protection
	South	1	Near drift fence	Restoration nursery
Soledad Canyon	North	3	To be determined	Restoration
Tecolote Canyon	Pocket Field	3	To be determined	Restoration

Removal of Deer

The permittee would have 5 years to remove all deer from the island. The deer (and the elk) are property of the permittee. Although choice of removal method would be left to the discretion of the permittee, NPS would oversee the removal efforts to insure no impact to other resources, and to insure safety of visitors and staff. The permittee would be required to submit a detailed removal plan, with timetable, subject to NPS approval.

There would be no reduction in elk, which would be managed as they are currently, at the discretion of the permittee.

Figure 2. Location of small riparian exclosures under Alternative B, Minimal Action.

Weed Management Program

Under this alternative, the weed management program would be increased as funding allows, in order to address weed management problems on Santa Rosa Island. A comprehensive weed management program would need to be in place by 2011, when cattle and elk would be abruptly removed from the island.

Grazing Management

Current range management practices would continue. Cattle would continue to graze under a continuous use system, with no management actions taken to improve distribution of cattle; use of riparian areas would continue to be heavy at times during the hot season. Stocking rate would be adjusted via monitoring of residual dry matter (RDM) in pastures, with cattle being removed from pastures when RDM falls below critical values.

Monitoring

The Park would conduct limited monitoring of range conditions, water quality and riparian areas.

Table 6. Implementation schedule for Alternative B, Minimal Action.

Year	Action
1997	Close Old Ranch Pasture to cattle Construct three SISTLE's in Arlington Permittee begins removal of deer
1998	Construct three SISTLE's in Canada Verde
1999	Construct three SISTLE's in Water Canyon
2000	Construct three SISTLE's in Canada Soledad
2001	Construct three SISTLE's in Canada Tecolote Permittee completes removal of deer
2011	All livestock have been removed from the island Begin removal of SISTLE fencing
2012	Complete removal of SISTLE fencing

ALTERNATIVE C. TARGETED MANAGEMENT ACTION

Closure of Old Ranch Pasture with Removal of Horses, Split of North Pasture and Implementation of Rotational Grazing, Construction of Water Developments, Construction of Small Riparian Enclosures, Removal of Deer, Reduction of Elk Herd, Changes in Grazing Management

Pastures Targeted for Management: Old Ranch
North (Brockway)

This alternative differs from the previous in the tool of choice for addressing water quality improvement in pastures other than Old Ranch. Whereas the previous alternative (Minimal Action) relies upon small riparian enclosures to protect water quality and riparian values, this alternative adds rotational grazing on a portion of the island, and some water developments to improve distribution of cattle. This alternative also adds management measures for elk, a shorter time frame for removal of deer, removal of horses from Old Ranch Pasture, and changes to current grazing management practices in order to afford greater protection to upland resources. In 2011 there would be rapid removal of ungulates from 95% of the island.

Closure of Old Ranch Pasture

Old Ranch pasture would be immediately closed to cattle and horses. Due to this pasture closure, islandwide available AUM's would decrease from current 41,102 to 38,383, a decrease of 7%. The horse herd in Old Ranch would be moved to another pasture.

Split North Pasture and Implementation of Rotational Grazing, Construction of Water Developments

Under this alternative, North Pasture would be split in two by construction of a fence along the Smith Highway (Figure 3). Such a fence would be approximately 6 miles in length. The northern portion of North Pasture would be renamed Brockway Pasture. It contains significant riparian reaches of the drainages in North Pasture. The new southern pasture, which contains upland areas, would be named Black Mountain Pasture.

The existing grazing capacity of North Pasture as calculated in the Range Management Plan (Bartolome and Clawson 1992) was split to estimate grazing capacity for Brockway and Black Mountain pastures. This allows implementation of the following six-month rotation.

During the hot season (May 1 to October 30), Brockway Pasture would be rested, and cattle formerly grazing in that area would graze in Black Mountain Pasture. To facilitate this, three water developments would need to be constructed (at Round Top, Army Camp and at another site to be determined; Figure 3). During the cool season, Black Mountain would be rested and cattle would graze in Brockway. Thus, the significant riparian areas in Brockway would be rested during the hot season.

Figure 3. Location of small riparian exclosures and water developments under Alternative C, Targeted Management Action.

Given the current grazing capacity for North Pasture, 826 cattle could graze in Black Mountain Pasture during the summer season; 1652 would graze Brockway in winter. There would be no permanent loss of AUM's, or grazing capacity, from current levels (beyond the 7% loss due to the closure of Old Ranch Pasture).

Construction of Small Riparian Exclosures

A total of nine riparian exclosures (SISTLE's) would be placed in certain drainages to serve as nursery stock areas, to protect existing resources, and to improve water quality on stream reaches (Table 7, Figure 3).

Removal of Deer and Reduction of Elk Herd

The permittee would have three years to remove all deer from the island, with targeted removal goals of 50% by year 2 and 100% by the end of year 3. Additionally, the permittee would be required to reduce the elk population from its current level of 1100 animals to 450 animals within three years. The elk population dropped to approximately 450 animals during the drought years of the early 1990's, and has since increased (Fig. 5). Accordingly, a maximum of 450 has been chosen as a minimum viable population number. Choice of reduction method would be left to the permittee, since the elk and deer are property of the permittee. Nonetheless, NPS would oversee the removal efforts to insure no impact to other resources, and to insure safety of visitors and staff. The permittee would be required to submit a detailed removal plan, with timetable, subject to NPS approval.

Changes in Grazing Management

The following changes in grazing management would be implemented. The minimum RDM would be raised from 400 to 1000 lb./ac (pounds per acre). Cattle would need to be removed from a pasture when the average RDM for that pasture fell below 1000 lb./ac. Leaving a minimum of 1000 lb./ac of RDM on pastures in the fall would ensure enough forage to sustain cattle through the early portion of green up.

Weed Management Program

Under this alternative, the weed management program would be increased as funding allows, in order to address weed management problems on Santa Rosa Island. A comprehensive weed management program would need to be in place by 2011, when cattle, deer and the remainder of the elk would be abruptly removed from the island.

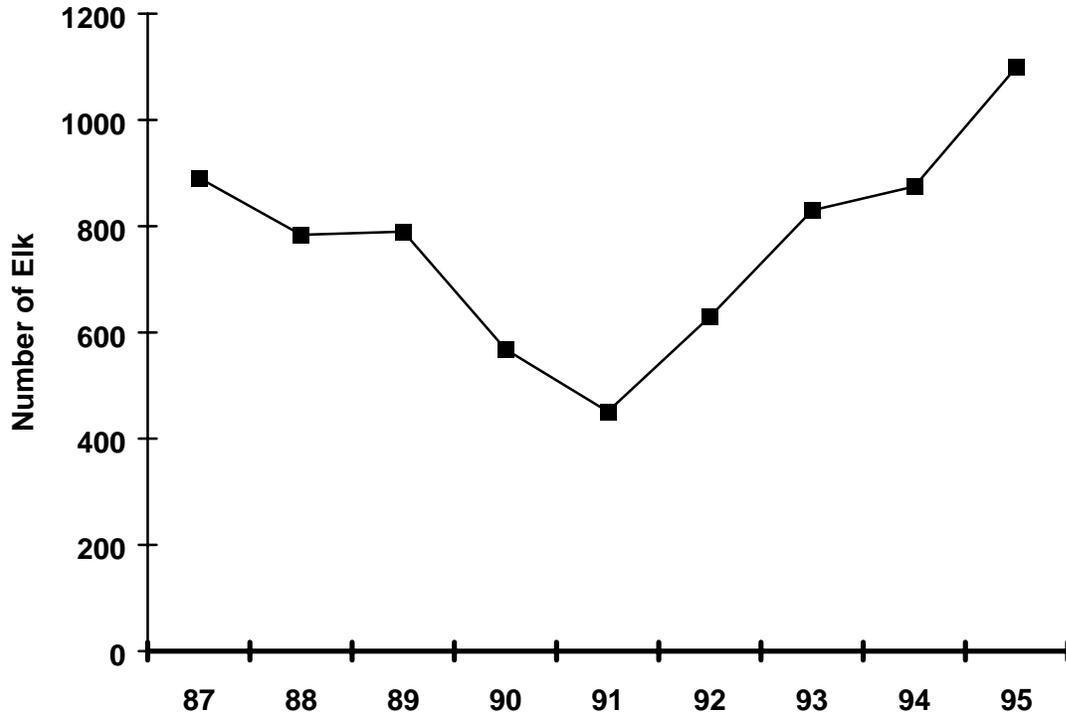


Figure 4. Estimated elk numbers on Santa Rosa Island (data from annual helicopter surveys by Vail & Vickers).

Monitoring

The schedule for water quality monitoring would be changed from monthly to annually, and would focus on drainages in targeted pastures, and some in untargeted pastures. Annual monitoring of riparian areas would be added.

Table 7. Location of SISTLE's on Santa Rosa Island, under Alternative C.

Drainage	Pasture	Number of SISTLEs	Location	Purpose
Arlington	Pocket Field	1	in Pocket Field	Restoration
Water Canyon	North	1	Near lower corral	Protection
Acapulco	South	1	Above China Camp	Restoration
Jolla Vieja	South	1	At cattail pond	Protection
Box Canyon	Wire Field	1	At Box Spring	Protection
Unnamed drainage above Johnson's Lee	South	1	At remnant willows	Protection
Soledad Canyon	North	1	To be determined	Restoration
Windmill	North	1	at confluence of Windmill and Cherry	Protection
Tecolote	Pocket Field	1	To be determined	Restoration

Table 8. Implementation schedule for Alternative C, Targeted Management Action.

Year	Action
1997	Close Old Ranch Pasture to cattle Construct fence along Smith Highway Construct water developments in Black Mountain Pasture Permittee begins removal of deer and elk reduction Implement increase in minimum RDM
1998	Begin rotational grazing between Brockway and Black Mountain Pastures Construct SISTLE's in Arlington, Water and Jolla Vieja Permittee continues removal of deer
1999	Construct SISTLE's in Windmill, Box and Johnson's Lee Permittee completes removal of deer
2000	Construct SISTLE's in Acapulco, Soledad and Tecolote
2002	Permittee completes reduction of elk herd
2011	All livestock have been removed from the island Begin removal of SISTLE fencing and Smith Highway fencing
2012	Complete removal of fencing

ALTERNATIVE D. REVISED CONSERVATION STRATEGY (THE PROPOSED ACTION)

Phased Reduction of Cattle and Horses, Phased Reduction of Deer, Phased Reduction of Elk, Changes in Grazing Management, Construction of Exclosures, Expanded Weed Management Program, Road Management Actions, Increased Visitor Access

Targeted Pastures: Old Ranch
North
South
Pocket Field
Carrington
Wire Field

Summary

The proposed action would improve water quality, protect riparian habitat areas, and conserve rare species and their habitats on Santa Rosa Island through phased reduction of cattle grazing and commercial hunting over the next 14 years. This alternative was formed by modifying the recommendations proposed by the interagency Conservation Strategies Team, which developed a conservation strategy for candidate and proposed species on the northern Channel Islands (Coonan et al. 1996). The Team's recommendations were revised to reflect comments received on the Draft RMP/EIS (see Volume II of this Final RMP/EIS) and to address certain operational management concerns on Santa Rosa Island.

Proposed actions include the immediate closure of Old Ranch and Carrington pastures to cattle and horses, and rapid phased reduction of grazing in two pastures containing sensitive, at-risk resources (Pocket Field and North pastures). Cattle exclosures would be built to protect riparian areas in Jolla Vieja Canyon (South Pasture) and Box Springs (Wire Field Pasture). Deer would be removed from the island by the year 2000, and elk would be reduced over the next 14 years. The Park would implement road management actions to reduce impacts to island streams, and would develop a comprehensive weed management plan to address problems caused by exotic species. The Park would develop monitoring programs for rare species, water quality and riparian recovery. Visitor access to Santa Rosa Island would be increased beyond current levels.

Implementation of these actions would gradually remove the influence of non-native ungulates from the island's natural systems, thus allowing these systems to begin recovery from the perturbations caused by many years of grazing and browsing. This would allow the re-establishment of natural ecosystem processes such as nutrient cycling and fire, and would allow NPS to cope with any problems arising from ungulate removal (such as changes in the distribution of weedy species). The relatively quick reduction of deer is prescribed due to the disproportionate influence that deer exert on sensitive biological communities and rare species. Reduction of livestock stocking levels in certain areas is accelerated in order to confer immediate protection on rare species and native plant communities, to initiate recovery of systems, and to achieve rapid recovery of riparian function and improvement of water quality in the targeted areas.

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The management actions described here would be incorporated into a new Special Use Permit for Vail & Vickers which would replace the existing Special Use Permit. Similar to previous SUP's for the Vail & Vickers operation, the new SUP would be valid for a period of five years. Completion of this RMP, however, does not represent a commitment by NPS to issue subsequent SUP's to Vail & Vickers.

The Residual Dry Matter monitoring currently used by the park to guide stocking rates would continue to be used, but only to adjust stocking rates during drought years. Residual Dry Matter monitoring is not adequate by itself to determine allowable stocking rates because it does not assess the status of the most impacted resources (riparian, water quality, native plant species).

The actions contained in this alternative pertain only to the commercial ranching and hunting operation currently operating on Santa Rosa Island, and to the Park's road maintenance program. These proposed actions do not affect the Park's long range plan to develop and maintain a demonstration ranch on approximately 800 acres at Beecher's Bay (General Management Plan, 1985). The purpose of the demonstration ranch would be to interpret the ranching history of the island.

In compliance with Section 7 of the Endangered Species Act, the Park has submitted to U.S. Fish and Wildlife Service a biological assessment analyzing the effects of these proposed actions on species listed as endangered or threatened, and on species proposed to be listed as such under the Endangered Species Act. The Park will comply with any requirements set forth by USFWS in a subsequent biological opinion.

Summary of Changes in Alternative D

This alternative D, Revised Conservation Strategy, has been modified from the original alternative D, Conservation Team Recommendation. The following changes have been incorporated and the reasons for these changes are given below:

Alternative D no longer includes a proposal to split North Pasture and implement rotational grazing because of probable impacts to rare species and habitats in North Pasture that would result from such a rotational grazing program. These impacts were identified in the Draft RMP/EIS, and included local erosion from increased stocking density in riparian areas, impacts to soil from cattle concentration around water developments, and impacts to chaparral and woodland vegetation communities from increased stocking density in the Black Mountain area

The revised Alternative D calls instead for phased reductions in stocking level in North Pasture, with closure of the pasture to grazing in 2008. This change in Alternative D is not significant relative to the range of alternatives presented in the Draft RMP/EIS, which analyzed alternatives which contained the proposed pasture split and rotational grazing program (alternatives C and D) and alternatives which did not contain such a proposal (A, B, and E).

Alternative D does not include the proposed construction of water developments in North Pasture. The water developments were intended to increase cattle distribution in North Pasture, in order to facilitate the proposed pasture rotation. The revisions to Alternative D make water developments unnecessary. This change in Alternative D is not significant relative to the range of

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alternatives presented in the Draft RMP/EIS, which analyzed alternatives which contained the proposed water developments (alternatives C and D) and alternatives which did not contain such a proposal (A, B, and E).

The schedule for phased removal of grazing has been modified slightly. The schedule in the original Alternative D in the Draft RMP/EIS depended upon a three-pasture rotation among Pocket Field Pasture and the split North Pasture. Because the proposed split of North Pasture was found to be inappropriate, the use of the former schedule for phased reduction of grazing needed revision. The new schedule for phased reduction of stocking levels is presented in the sections below, and is based upon a pasture-by-pasture analysis of impacts to sensitive resources. This change in Alternative D is not significant relative to the range of alternatives presented in the Draft RMP/EIS, which analyzed alternatives which contained no phased reduction of stocking levels (alternatives A, B, and C), one alternative with a phased reduction of stocking levels (Alternative D), and one alternative with a rapid reduction of stocking levels (Alternative E).

The schedule for removal of deer has been changed slightly. The schedule for reduction is still three years (by 2000), but the annual maximum allowable deer numbers have changed slightly. The original schedule was Year 1 - 300, Year 2 - 100, and Year 3 - 0. The new schedule is 1997 - 700 (current population estimate), 1998 - 500, 1999 - 250, 2000 - 0. The Park has chosen this new schedule to reflect the annual reduction possible, given this plan would become effective mid-summer 1997. This change in Alternative D is not significant relative to the range of alternatives presented in the Draft RMP/EIS, which analyzed alternatives which contained no reduction of deer (Alternative A), one alternative with a five-year phased reduction of deer (Alternative B), and three alternatives with a three-year reduction of deer (alternatives C, D and E).

The schedule for reduction of elk has been adjusted somewhat. The schedule for reduction is still 14 years (by 2011), but the annual maximum allowable elk numbers have changed slightly (see section below on elk reduction). The Park has chosen this new schedule because removal of deer and reduction of elk numbers should reduce impacts on native habitats and species to acceptable levels. Furthermore, monitoring elk impacts to *Castilleja mollis* would allow NPS to adjust the elk reduction schedule as needed to minimize impacts. This change in Alternative D is not significant relative to the range of alternatives presented in the Draft RMP/EIS, which analyzed alternatives which contained no reduction of elk (alternatives A and B), two alternatives with a 14-year phased reduction of deer (alternatives C and D), and one alternative with a three-year reduction of elk (Alternative E).

Road management actions have been added to Alternative D in order to minimize impacts to island streams from road maintenance activities. Road management actions were added to the plan in response to comments the Park received on the Draft RMP/EIS. This change in Alternative D is not significant relative to the range of alternatives presented in the Draft RMP/EIS. The Draft identified best management practices for road management as a common element to all five alternatives considered.

Visitor access to the island has been slightly augmented under revised Alternative D in order to increase recreational opportunities for visitors on Santa Rosa Island. This change in Alternative D is not significant relative to the range of alternatives presented in the Draft RMP/EIS, which

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analyzed three alternatives which contained no increase in visitor access (alternatives A, B, and C), one in which a moderate increase in visitor access was anticipated, due to reductions in grazing (Alternative D), and one alternative in which a substantial increase in visitor access was anticipated, due to rapid removal of grazing and commercial hunting (Alternative E).

The following are the proposed elements of this alternative.

Phased Reduction of Cattle and Horses

All cattle and horses would be removed from Santa Rosa Island (with the exception of animals permitted for the demonstration ranch, per the 1985 General Management Plan) by 2011, according to the following pasture by pasture schedule. Over the next 14 years, stocking levels, as indicated by allowable Animal Unit Months (AUM's), would be reduced to approximately 50% of current levels by the year 2001. Stocking levels would remain at this reduced level until final phaseout of cattle occurs from 2008 to 2011 (Table 9, Fig. 6).

Old Ranch and Carrington pastures would be closed to grazing in 1997 and 1998, respectively. Stocking level in Pocket Field Pasture would be reduced to 50% in 1998, 25% in 1999, and the pasture would be closed to grazing in 2000. Stocking level in North Pasture would be reduced to 25% of the current level by 2001, and the pasture would be closed to grazing in 2008. Stocking level in South Pasture would remain at current level until 2008, when it would be reduced annually by 25% until the pasture is closed in 2011. Stocking levels in Wire Field, Lobo, Horse, Wreck Trap and Arlington Beef Trap would remain at current recommended levels (Bartolome and Clawson 1992) until the pastures are closed to grazing in 2011.

Initial allowable AUM's are based upon those recommended by Bartolome and Clawson (1992) in the original Range Management Plan for Santa Rosa Island, and those levels are the initial points of departure, or baseline levels, for the scheduled stocking reductions. Pasture reductions go into effect on January 1 of each given year. No pasture would be permitted to have more than the AUM's set forth by this schedule, and NPS may reduce the number of AUM's permitted in years when range monitoring shows declines in forage or ground cover sufficient to cause loss of pasture soils.

Table 9. Scheduled phased reduction of stocking level (in AUM's), by pasture.

	Pastures										Total AUM's
	South	North	Pocket Field	Old Ranch	Wire Field	Lobo	Carring.	Arl. Beef Trap	Horse	Wreck Trap	
1996	13682	11150	8973	2719	1094	1419	1234	363	270	197	41101
1997	13682	11150	8973	0	1094	1419	1234	363	270	197	38382
1998	13682	8362	4487	0	1094	1419	0	363	270	197	29874
1999	13682	5575	2243	0	1094	1419	0	363	270	197	24843
2000	13682	5575	0	0	1094	1419	0	363	270	197	22600
2001	13682	2787	0	0	1094	1419	0	363	270	197	19812
2002	13682	2787	0	0	1094	1419	0	363	270	197	19812
2003	13682	2787	0	0	1094	1419	0	363	270	197	19812
2004	13682	2787	0	0	1094	1419	0	363	270	197	19812
2005	13682	2787	0	0	1094	1419	0	363	270	197	19812
2006	13682	2787	0	0	1094	1419	0	363	270	197	19812
2007	13682	2787	0	0	1094	1419	0	363	270	197	19812
2008	10261	0	0	0	1094	1419	0	363	270	197	13604
2009	6841	0	0	0	1094	1419	0	363	270	197	10184
2010	3421	0	0	0	1094	1419	0	363	270	197	6764
2011	0	0	0	0	0	0	0	0	0	0	0

The relationship of Bartolome and Clawson's recommended stocking levels to current and recent actual island stocking levels is given in Appendix A. Bartolome and Clawson's recommended stocking levels may have been appropriate at the time the original Range Management Plan for Santa Rosa was developed (1992), but recently identified threats and impacts to water quality, rare species and other sensitive resources warrant the scheduled reduction of stocking levels given in Table 9.

In order to insure compliance with prescribed phaseout stocking levels, Vail & Vickers would be required to record and report monthly cattle use of each pasture via head-days.

A pasture by pasture discussion of the phased reduction of livestock (cattle and horses) follows.

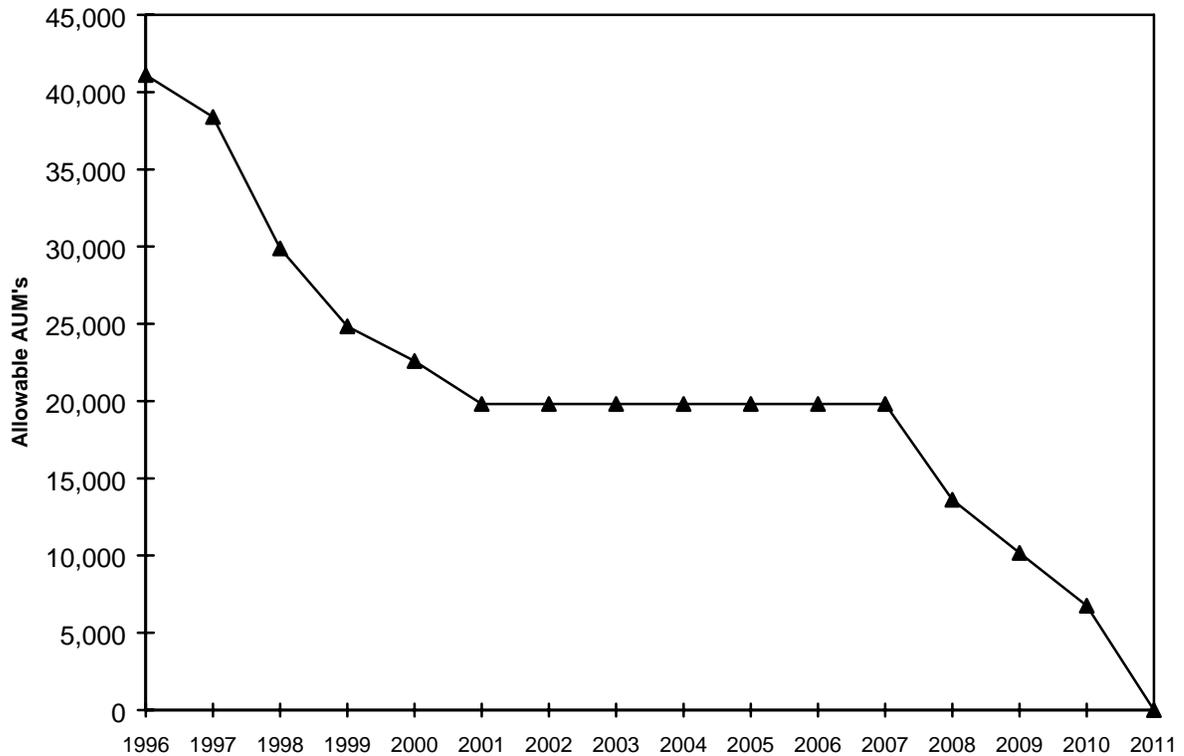


Figure 5. Annual allowable Animal Unit Months (AUM's) on Santa Rosa Island.

Old Ranch Pasture

In 1997, Old Ranch Pasture would be permanently closed to cattle and horse grazing (Table 10). The recommended stocking level in Old Ranch Pasture (for a “good year”) from the original Range Management Plan (Bartolome and Clawson 1992) is 2,719 AUM's. Upon closure of Old Ranch Pasture, these AUM's would be subtracted from the island-wide allotment; that is, stocking levels would not be increased in other pastures to offset the closure of Old Ranch Pasture to grazing. Bartolome and Clawson's recommended stocking level for Old Ranch Pasture may have been appropriate at the time the original Range Management Plan for Santa Rosa was developed (1992), but they did not consider threats and impacts to water quality, rare species and other sensitive resources.

Table 10. Closure of Old Ranch Pasture to livestock (cattle and horse) grazing.

Year	Action	Allowable AUM's	% Reduced
1996		2,719	0%
1997	Close Old Ranch Pasture to cattle and horses. Cattle AUM's are subtracted from island allotment. Horses would be moved to other open pastures.	0	100%

Under this alternative, Old Ranch Pasture would be closed to livestock (cattle and horse) grazing in order to protect and restore sensitive species, water quality and riparian values.

The beaches of Old Ranch Pasture are the most important breeding and nesting habitat for the Western Snowy Plover, a threatened shorebird, on Santa Rosa Island. Cattle are known to utilize the nesting habitat of the plovers. In a biological opinion in 1995, USFWS identified cattle as a threat to plovers during the breeding season and required the Park to reduce or eliminate take of western snowy plovers as a result of ranching activities.

Moreover, Old Ranch Pasture contains habitat for *Dudleya blochmaniae* ssp. *insularis*, *Dudleya greenei* forma *nova*, *Phacelia insularis* var. *insularis*, and *Gilia tenuiflora* ssp. *hoffmannii*; all species that are proposed for listing as endangered under the Endangered Species Act. Cattle and horses utilize the habitat of these species, and grazing and trailing by livestock contribute to habitat degradation. In their northern Channel Islands listing proposal, USFWS identified cattle grazing and/or trampling as threats to these species (USFWS 1995).

Old Ranch Pasture also contains habitat for *Lasthenia glabrata* ssp. *coulteri*, a rare plant which is known from nowhere else on the Channel Islands. This wetland species occurs in a small swale near the mouth of Old Ranch Canyon which is used very heavily by cattle. The only other populations of this plant occur in vernal pools in the southern San Joaquin Valley. The vernal pool habitat type is considered to be highly endangered (Schoenherr 1989, Ecological Society of America Ad Hoc Committee on Ecosystem Management 1996). The observations of McEachern et al. (1997) indicate that cattle trampling negatively impacts the *Lasthenia* population in Old Ranch Pasture.

Dudleya candelabrum, which occurs only in small numbers and in widely-separated locations on the island, and then only in habitats completely protected from both grazing and browsing, occurs in two or three spots in the pasture. Presence of grazing animals currently prevents implementation of active restoration measures for these extremely small populations.

The water quality in Old Ranch Creek has often not met the fecal coliform standards established by the State of California for both contact and non-contact recreation. Old Ranch Creek was also determined to be non-functional by the Rapid Riparian Assessment Team (RRAT). However, it was also identified as a watercourse which had a high likelihood of recovery if actions were taken to improve cattle management. Improvement of water quality in these streams is desirable because island visitors frequently travel unescorted through Old Ranch Pasture and cross, or hike along, Old Ranch Creek. Closure of the pasture to grazing would immediately eliminate cattle trampling and livestock fecal inputs to streams, except upstream in other pastures.

The coastal marsh at the mouth of Old Ranch Canyon Pasture is currently heavily utilized by cattle. The coastal marsh habitat type is an endangered habitat in Southern California (Schoenherr 1989, Ecological Society of America Ad Hoc Committee on Ecosystem Management 1996). Siltation throughout the historic period of grazing has raised the ground level in the marsh, resulting in a drying of the soil and invasion of non-native upland plants.

Closure of Old Ranch Pasture to cattle and horse grazing would confer protection on the vernal pools in the pasture. Old Ranch Pasture is one of only two pastures on the island with a

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significant number of vernal pools, a rare and threatened biological community (Ecological Society of America Ad Hoc Committee on Ecosystem Management 1996) featuring a high degree of endemism of both plants and animals. The pools in this pasture still retain, more-or-less intact, many of the identifying features, and can act as a “biotic reservoir” for restoration of other, more heavily impacted pools on the island. Removal of ongoing disturbance by cattle and horses would allow protection of these resources.

Carrington Pasture

In 1998, Carrington Pasture would be permanently closed to cattle and horse grazing. The recommended stocking level in Carrington Pasture (for a “good year”) from the original Range Management Plan (Bartolome and Clawson 1992) is 1234 AUM’s. Upon closure of Carrington Pasture, these AUM’s would be subtracted from the island-wide allotment; that is, stocking levels would not be increased in other pastures to offset the closure of Carrington Pasture to grazing. Bartolome and Clawson recommended a stocking level for Carrington Pasture that was appropriate at the time the original Range Management Plan for Santa Rosa was developed (1992), but they were not aware of recently identified threats and impacts to water quality, rare species and other sensitive resources. The Park is now closing the pasture to cattle and livestock grazing in order to protect and restore rare species and habitats.

Table 11. Closure of Carrington Pasture to livestock (cattle and horse) grazing..

Year	Action	Allowable AUM’s	% Reduced
1997		1,234	0%
1998	Close Carrington Pasture to cattle and horses. Cattle AUM’s are subtracted from island allotment.	0	100%

Carrington Pasture provides habitat for three plant species proposed for listing as endangered under the Endangered Species Act, *Phacelia insularis* var. *insularis*, *Castilleja mollis*, and *Gilia tenuiflora* ssp. *hoffmannii*, and contained historic habitat for *Arabis hoffmannii*. Cattle are known to negatively impact the habitats of these species. In their northern Channel Islands listing proposal, USFWS identified cattle grazing and/or trampling as threats to these species (USFWS 1995).

Carrington Pasture also provides habitat for two rare species that have been considered for federal listing: *Orobanche parishii* ssp. *brachyloba* (another hemi-parasite which, like *Castilleja mollis*, also depends on the health and vigor of its host, Goldenbush [*Isocoma menziesii*] for its survival) and *Erysimum insulare* ssp. *insulare*. Fifteen other plants considered rare on the Channel Islands or in California (Coonan et al. 1996) also occur in this pasture. Approximately 97% of the native lupine scrub community found on Santa Rosa Island occurs in Carrington Pasture.

Closure of Carrington Pasture to grazing in 1998 would protect proposed and other rare plant species in the pasture.

Pocket Field Pasture

Cattle grazing would be phased out in Pocket Field Pasture by 2000 (Table 12, Figure 7). Stocking level would be reduced to 50% of the current allowable level by 1998, to 25% in 1999, and the pasture would be closed in 2000. The recommended stocking level in Pocket Field Pasture (for a “good year”) from the original Range Management Plan (Bartolome and Clawson 1992) is 8,973 AUM’s. Upon initial reduction of AUM’s and ultimate closure of Pocket Field Pasture, these AUM’s would be subtracted from the island-wide allotment; that is, stocking level would not be increased in other pastures to offset the closure of Pocket Field Pasture to grazing. Bartolome and Clawson recommended a stocking level for Pocket Field Pasture that was appropriate at the time the original Range Management Plan for Santa Rosa was developed (1992), but they were not aware of recently identified threats and impacts to water quality, rare species and other sensitive resources.

Table 12. Scheduled phased reduction of stocking level in Pocket Field Pasture.

Year	Action	Allowable AUM’s	% Reduced
1997		8,973	0%
1998	Reduce allowable AUM’s in Pocket Field to 50% of current allowable use	4,487	50%
1999	Reduce allowable AUM’s to 50%	2,243	25%
2000	Close Pocket Field Pasture to cattle and horse grazing.	0	25%

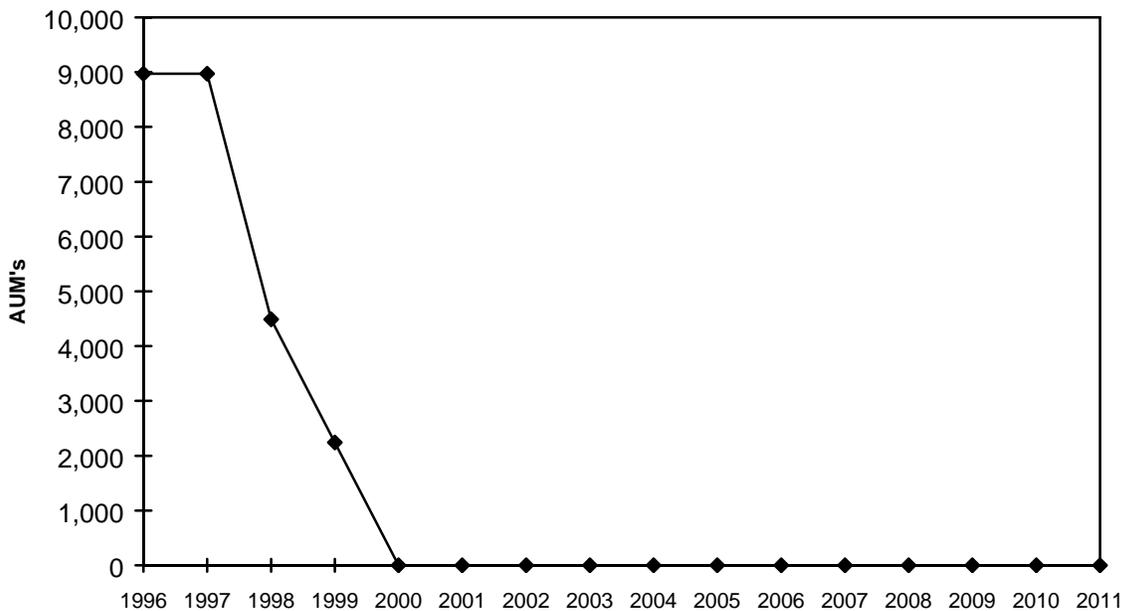


Figure 6. Scheduled phased reduction of stocking level in Pocket Field Pasture.

Under this alternative, stocking level in Pocket Field Pasture would be rapidly reduced in order to protect populations of proposed and other rare plant species, and to improve water quality and riparian function.

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Pocket Field provides habitat for *Castilleja mollis*, a plant species proposed for listing as endangered under the Endangered Species Act. Cattle are known to trample and break these plants (McEachern et al. 1997), and cattle grazing was identified by USFWS as a threat to *Castilleja mollis* (USFWS 1995) in their northern Channel Islands listing proposal. Additionally, goldenbush (*Isocoma menziesii*), the host plant of *C. mollis*, is impacted by cattle. Pocket Field also provides habitat for eleven other rare plant species (Coonan et al. 1996).

Rapid reduction of stocking level in Pocket Field would rapidly improve water quality and restore riparian function in the pasture's streams, which have been highly impacted by cattle grazing, but are good candidates for restoration. The Rapid Riparian Assessment Team surveyed three reaches of Arlington Canyon creek and determined them to be nonfunctional, noting that all three sites were missing almost all the attributes required for a proper functioning riparian area, but that the stream had high potential for restoration (Rosenlieb et al. 1995). The RRAT team also visited the other drainages in Pocket Field Pasture: Tecolote, Tecolotito, and Garanon. Although they did not assess riparian function in those drainages, they did note that Tecolote showed the same signs of potential and promise that Arlington did.

Rapid reduction of stocking level in Pocket Field Pasture would eliminate cattle impacts to the vernal pools located west of Garanon Canyon. Vernal pools are a rare and threatened habitat type in California (Schoenherr 1989, Ecological Society of America Ad Hoc Committee on Ecosystem Management 1996). In a survey of vernal pool invertebrates, Furlong (1996) observed that the vernal pools in Pocket Field were heavily impacted by cattle grazing, with cattle observed utilizing the pools during the survey. Furlong noted that cattle may negatively impact vernal pools by trampling bank vegetation, walking through pools, standing/urinating/defecating in pools, and introducing weedy species.

The major non-native broad-leaved weeds in Pocket Field are Napa thistle (*Centurea melitensis*), bur-clover (*Medicago polymorpha*), and sweet-clover (*Melilotus albus*). All these weeds would be reduced both in frequency and impact on native plant communities by general reduction of grazing and browsing level, which would allow development and maintenance of taller and more complete vegetation canopies and litter layers, and reduction of direct soil disturbance from hooves.

North Pasture

Stocking level in North Pasture would be reduced to 25% of the current pasture allotment by 2001, and would be closed to grazing in 2008 (Table 13, Figure 8). The recommended stocking level in North Pasture (for a "good year") from the original Range Management Plan (Bartolome and Clawson 1992) is 11,150 AUM's. Upon initial reduction of AUM's and ultimate closure of North Pasture, these AUM's would be subtracted from the island-wide allotment; that is, stocking levels would not be increased in other pastures to offset the reduction of stocking level in North Pasture. Bartolome and Clawson recommended a stocking level for North Pasture that was appropriate at the time the original Range Management Plan for Santa Rosa was developed (1992), but they were not aware of recently identified threats and impacts to water quality, rare species and other sensitive resources.

Table 13. Scheduled phased reduction of stocking level in North Pasture.

Year	Action	Allowable AUM's	% Reduced
1997		11,150	0%
1998	Reduce allowable AUM's in North Pasture to 75% of current allowable use	8,362	25%
1999	Reduce allowable AUM's to 50%	5,575	25%
2000		5,575	0%
2001	Reduce allowable AUM's to 25%	2,787	25%
2002		2,787	0%
2003		2,787	0%
2004		2,787	0%
2005		2,787	0%
2006		2,787	0%
2007		2,787	0%
2008	Close North Pasture to cattle and horse grazing.	0	25%

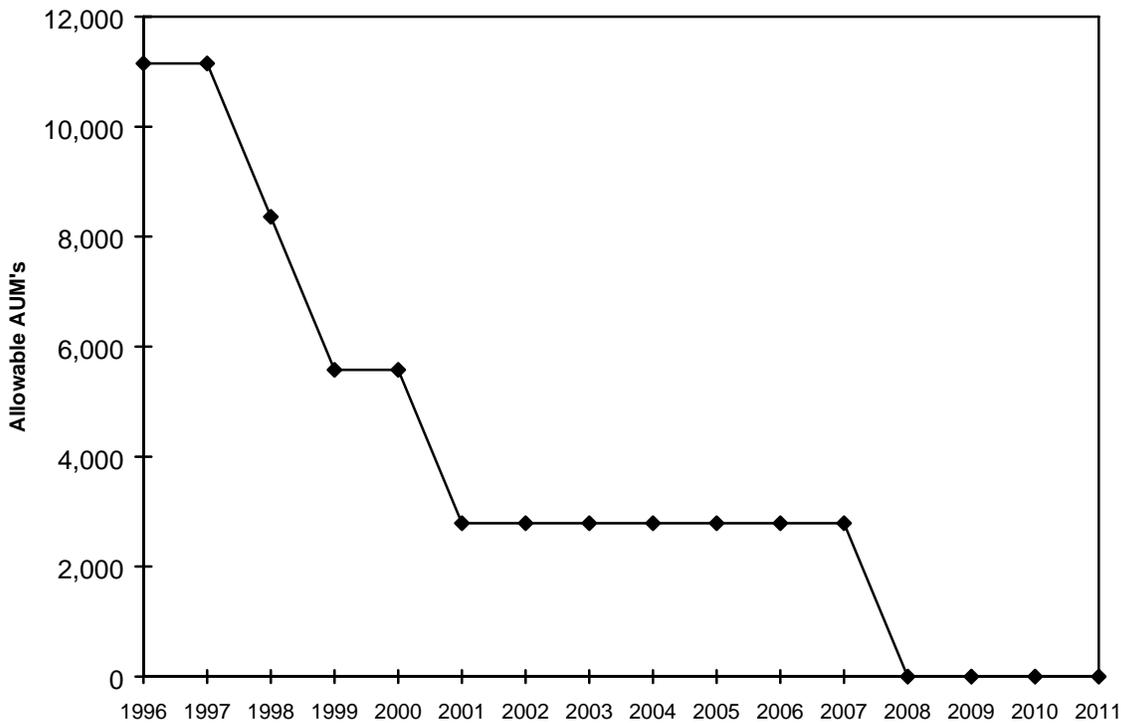


Figure 7. Scheduled phased reduction of stocking level in North Pasture.

This alternative proposes a significant initial reduction in stocking level in North Pasture in order to reduce ongoing impacts and potential threats to rare species and native plant communities, and to improve water quality and restore riparian function to the pasture's streams.

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Reduction in stocking level in North Pasture would eliminate current impacts and potential threats to rare species and native plant communities in North Pasture. The following plant species occur in North Pasture and are proposed for listing as endangered: *Arabis hoffmannii*, *Arctostaphylos confertiflora*, *Heuchera maxima*, and *Malacothrix indecora*. Cattle are known to impact each of these species, primarily through trampling (McEachern 1996; McEachern et al. 1997). In their northern Channel Islands listing proposal, USFWS identified cattle grazing and/or trampling as threats to *Arctostaphylos* and *Heuchera* (USFWS 1995). Forty-four plant species and subspecies commonly considered by botanists to be rare on the Channel Islands or in California also occur in North Pasture. Cattle are known to impact many of these species, primarily through trampling.

Significant native plant communities occur in North Pasture: Island Chaparral, Island Oak, Closed-cone Pine, Southern Riparian woodland, Island Mixed Woodland, and Coastal Sage Scrub. For each of these communities, over 50% of their range on Santa Rosa Island is in North Pasture. Several of these plant communities are recognized as endangered by botanical authorities (Ecological Society of America Ad Hoc Committee on Ecosystem Management 1996).

Reduction of stocking level in North Pasture would minimize the chance of visitors contacting surface waters with high bacteria counts. The only designated campground on the island is in North Pasture. The chance for visitor contact with streams in North Pasture, especially those in Water, Lobo, and Cherry Canyons, is very high. The fecal coliform levels in Water Canyon and Lobo Canyon, as measured between 1993 and 1996, regularly exceeded the standards set by the State of California for body contact recreation.

North Pasture has significant occurrences of the following alien plant species: milk thistle (*Silybum marianum*), bull thistle (*Cirsium vulgare*), spiny clotbur (*Xanthium spinosum*), and cheeseweed (*Malva parviflora*), all species which depend on 1) reduction of the vegetation canopy resulting from grazing and subsequent reduction of surface litter accumulations, 2) direct soil disturbance from trampling, bedding, and pawing, and 3) increase of soil fertility from animal droppings. These occur almost exclusively in the areas most heavily used and commonly frequented by cattle: canyon bottoms, both on the streamside terraces and along the stream beds, and certain upland areas of concentration: favored resting and bedding sites and areas where feed supplements are provided. Reduction of the primary continuing source of disturbance, cattle, would allow the Park to move forward with control of these weeds.

North Pasture also contains most of the perennial mustard on the island; it has been significantly present in this location since the mid 1970's, when collections were made by both Dr. Ralph Philbrick and by Marla Daily. This invasive non-native plant, which unlike many other agricultural weeds, has the ability to invade and persist in shrub and woodland communities, is being spread on the island primarily by seed grazed off standing plants by cattle and elk and then deposited elsewhere. Reduction of cattle numbers in this pasture (and of elk island-wide) would materially reduce seed dispersal and spread of this weed, and greatly facilitate control/eradication efforts.

South Pasture

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Stocking level in South Pasture would remain at current level until 2008, when they would be reduced annually by 25% until the pasture is closed in 2011 (Table 14, Fig. 7). The recommended stocking level in South Pasture (for a “good year”) from the original Range Management Plan (Bartolome and Clawson 1992) is 13,682 AUM’s. Upon annual reduction of AUM’s in South Pasture, these AUM’s would be subtracted from the island-wide allotment; that is, stocking levels would not be increased in other pastures to offset the reduction of stocking level in South Pasture. Bartolome and Clawson recommended a stocking level for South Pasture that was appropriate at the time the original Range Management Plan for Santa Rosa was developed (1992), but they were not aware of recently identified threats and impacts to water quality, rare species and other sensitive resources. The Park is now reducing stocking level in South Pasture in order to protect and restore water quality and riparian values and rare species and habitats.

South Pasture is considered to be a lower priority for restoration compared with other Santa Rosa Island pastures, primarily due to the prevalence of sensitive resources in other pastures and the relative absence of such resources in South. Also it is difficult to apply cattle management actions in a large pasture such as South. For example, herding cattle would be difficult given the large area and steep terrain, and the steep slopes in drainages preclude the use of riparian exclosures for most streams in South Pasture. Thus, stocking level is kept at current for 10 years, at which time a rapid phaseout begins. Because of the relative lack of sensitive resources in South Pasture, a reduction in stocking level is not needed as quickly as in other pastures.

As stocking levels in other pastures are reduced, it is anticipated that the permittee would continue to use South Pasture as the main production pasture. Under the term of the permittee’s new Special Use Permit, the permittee would still have to abide by the prescribed stocking levels.

Table 14. Scheduled phased reduction of stocking level in South Pasture.

Year	Action	Allowable AUM’s	% Reduced
1997		13,682	0%
1998		13,682	0%
1999		13,682	0%
2000		13,682	0%
2001		13,682	0%
2002		13,682	0%
2003		13,682	0%
2004		13,682	0%
2005		13,682	0%
2006		13,682	0%
2007		13,682	0%
2008	Reduce stocking level in South Pasture to 75% of current.	10,261	25%
2009	Reduce stocking level in South Pasture to 50% of current.	6,841	25%
2010	Reduce stocking level in South Pasture to 25% of current.	3,421	25%
2011	Close South Pasture to cattle and horse grazing.	0	25%

Wire Field, Lobo Pasture, Wreck Trap, Arlington Beef Trap

Due to the relative lack of sensitive resources of Wire Field, Lobo Pasture, Wreck Trap and Arlington Beef Trap, stocking rates are set at current levels (Table 9) until those pastures are closed to grazing in 2011.

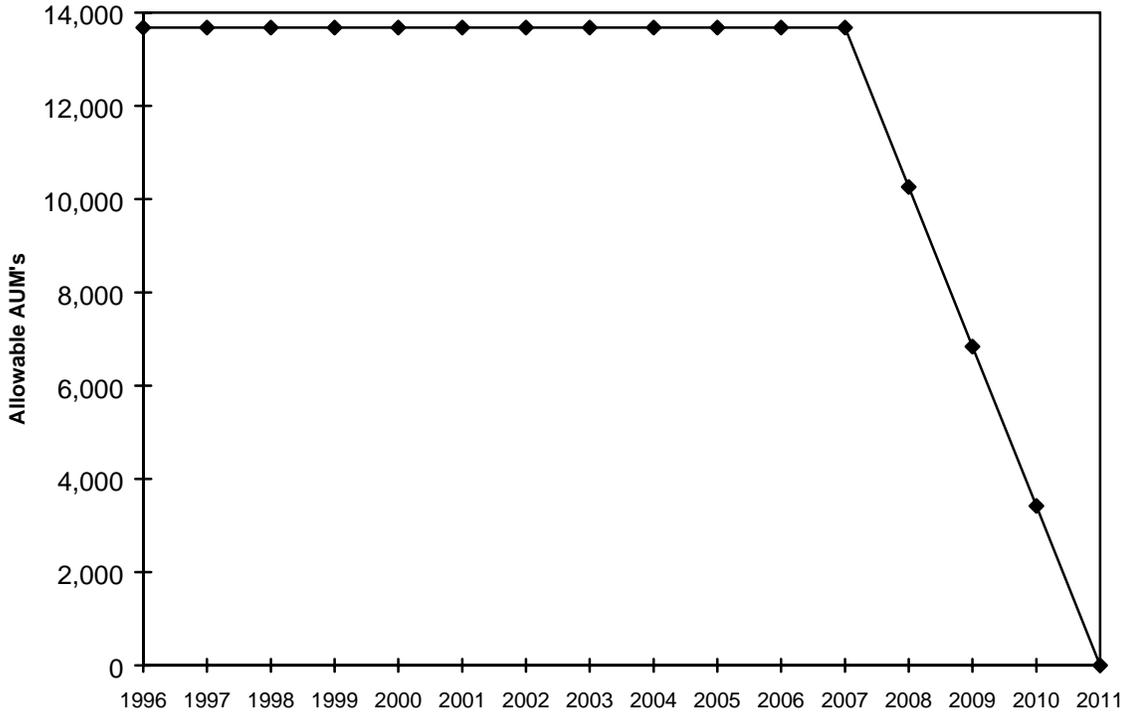


Figure 8. Scheduled phased reduction of stocking level in South Pasture.

Management of Ranch Horses

There is no specific phaseout schedule for ranch horses. Horses are included in pasture stocking reductions and phaseouts, and horse use of pastures must be included in the monthly pasture utilization reports submitted by the permittee. For reporting purposes, each horse would be equal to 1.2 Animal Units. Horses would be removed from the island on a schedule, determined by the permittee, that otherwise complies with the allowable stocking levels set forth in this alternative.

Phased Reduction of Deer

Deer would be removed from the island by 2000, according to a phased reduction program (Table 15). The Park has chosen this new schedule to reflect the annual reduction possible, given this plan would become effective mid-summer 1997. By the end of each calendar year, the deer population level must be at or below the given number of maximum deer allowed. Choice of reduction method would be left to the permittee, since the elk and deer are property of the permittee. Nonetheless, NPS would oversee the removal efforts to minimize impacts to other

resources, and to ensure safety of visitors and staff. The permittee would be required to submit a detailed removal plan, with timetable, subject to NPS approval. Operational concerns would be addressed in the new Special Use Permit. During the removal efforts, the Park may temporarily restrict visitor access to parts of the island, in order to ensure visitor safety.

Table 15. Deer reduction schedule.

Year	Maximum Deer Allowed
1997	700
1998	500
1999	250
2000	0

Deer are scheduled for rapid reduction because they are a primary impactor of vegetation in general, particularly island shrubs, and rare species in particular. Unlike cattle and elk, deer use woody vegetation as their primary food source. Therefore, they are having disproportionately large effects on the tree and scrub communities of Santa Rosa Island. The community analysis presented in the Conservation Strategies (Coonan et al. 1996) indicates that shrub communities support the highest biodiversity of all island communities, and they are essential habitat for a host of the rare, endemic and sensitive plants of the island. There are no areas of the island where deer have not browsed woody species. Almost every individual shrub that is accessible to browsers has been browsed.

Rapid reduction of deer would also eliminate a primary impactor of rare species. Deer browsing, bedding and/or trampling were identified by USFWS (1995) as major threats to the following species proposed for listing as endangered under the Endangered Species Act: *Arctostaphylos confertiflora*, *Castilleja mollis*, *Dudleya blochmaniae* ssp. *insularis*, *Dudleya greenii* forma *nova*, *Gilia teniflora* ssp. *hoffmannii*, *Heuchera maxima*, and *Phacelia insularis* ssp. *insularis*.

Recent surveys were conducted on Santa Rosa to map the distribution of rare plants and their habitats, and to assess the conditions of populations and habitats (McEachern 1996, McEachern et al. 1997). Most of the rare plants were found in shrub communities, either in the chaparral at Black Mountain and on South Point, or on nearly vertical canyon walls, inaccessible to ungulates, where coastal sage scrub, coastal bluff scrub and woodland vegetation remains relatively intact. Shrubs, including woody rare plants, in reach of deer were browsed nearly everywhere they were seen on the island. The effect of the browsing is to prune shrubs back from their growing tips, removing buds and flowers, and reducing seed set. Such pruning, along with development of deer trails, opens up the shrub canopy, changing the sunlight and heat regimes underneath the shrubs. Fire, which is a necessary process in some woody communities, cannot play its natural role in communities with insufficient vegetation to carry fire and with the presence of deer to browse seedlings that sprout following the fire. Recovery of island woody communities and the rare plants that inhabit them is not possible while deer are present.

Phased Reduction of Elk

Elk would be gradually reduced over the next 14 years, according to a phased reduction program (Table 16, Fig. 10). Choice of reduction method would be left to the permittee, since the elk and deer are property of the permittee. Nonetheless, NPS would oversee the removal efforts to minimize impacts to other resources, and to ensure safety of visitors and staff. The permittee

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would be required to submit a detailed removal plan, with timetable, subject to NPS approval. Operational concerns would be addressed in the new Special Use Permit. During the removal efforts, the Park may temporarily restrict visitor access to parts of the island, in order to ensure visitor safety.

Elk, like cattle, graze herbaceous vegetation; but they graze slightly different species at different seasons than cattle. Consequently, the cattle and elk have a greater combined ability to reduce vegetation cover on the Santa Rosa Island range than either ungulate alone. Additionally, elk are able to get to areas of the islands that cattle normally do not access because of the steep terrain. Plants and plant communities that normally would have topographic protection from grazers in a cattle-only operation remain unprotected as long as the elk are present. However, the phased removal of elk, in combination with the other components of this alternative, would reduce pressure on native communities.

Table 16. Elk reduction schedule.

Year	Maximum Elk Allowed
1997	900
1998	800
1999	700
2000	600
2001	500
2002	400
2003	350
2004	300
2005	250
2006	200
2007	170
2008	140
2009	110
2010	60
2011	0

This scheduled reduction of elk is less rapid than the recommendation of the Conservation Strategy Team. This is because the combined effects of the removal of deer and reduction of elk numbers should reduce impacts on native habitats and species to an acceptable level, such that the elk reduction schedule can be maintained. However, if monitoring shows that elk impacts continue to be significant on rare species and habitats, their removal will need to be accelerated.

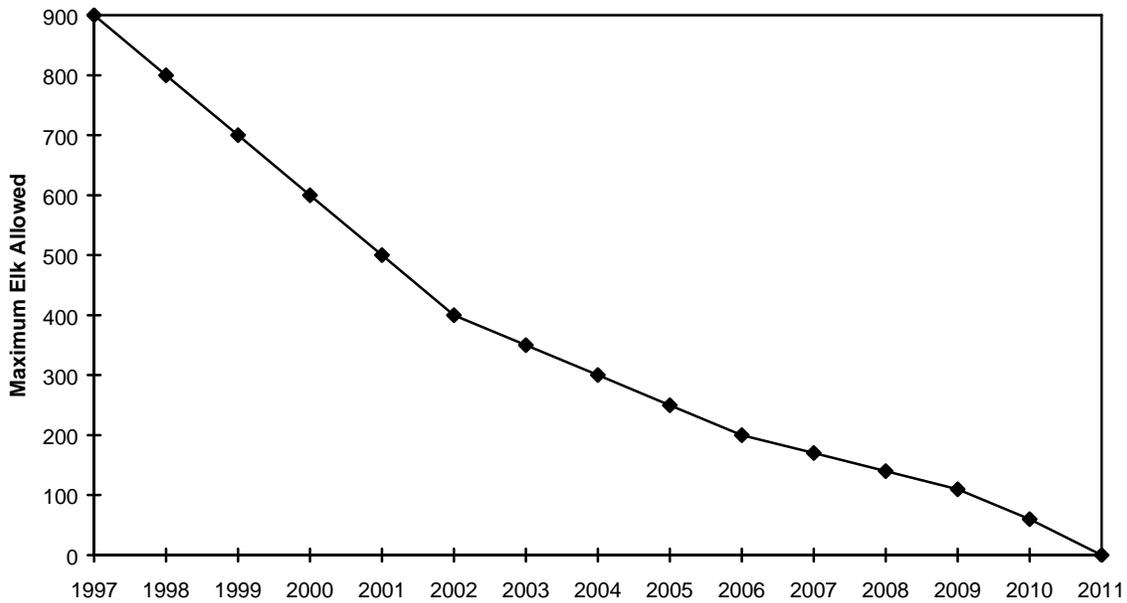


Figure 9. Elk reduction schedule.

The Park will specifically implement such a monitoring program for *Castilleja mollis*. Demographic studies of *Castilleja mollis* show that elk pawing and scraping and clearing of patches of ground during the rut is a major source of damage and mortality to plants (McEachern et al. 1997). The phased reduction and eventual removal of elk should reduce this threat to *Castilleja mollis*. As elk are removed, the Park would monitor *Castilleja mollis* for stem breakage and mortality. If monitoring shows that sufficient decreases in mortality and stem breakage of *C. mollis* aren't occurring, then permitted elk numbers would continue to be reduced at a rate of 100 animals per year until those levels are achieved, and 50 per year following that. In other words, if elk-caused impacts to *Castilleja mollis* continue beyond that expected, then the elk reduction schedule would continue at 100/year.

Changes in Grazing Management

Residual Dry Matter (RDM)

Under this alternative, Residual Dry Matter (RDM) would not be a primary factor in setting stocking levels for pastures. Currently, the Park measures RDM twice a year, in the spring and fall. RDM monitoring is commonly used in cattle production operations because it is easy to do and focuses on sustainable yield of upland forage. However, RDM does not provide sufficient information on livestock impacts to the important natural resources (riparian areas, water quality, rare species, native vegetation) which are the focus of this management plan. The Park will continue or initiate monitoring programs for those important natural resources (see Monitoring section of this chapter).

The riparian zones and nearby areas are preferred grazing areas for cattle. Most cattle do not move out of the riparian and adjacent areas until the vegetation in that area has been largely removed. The RDM monitoring occurs outside of the preferred zone for cattle (RDM monitoring

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occurs more than ¼ mile from water sources). Additionally, RDM monitoring assesses the amount of non-native annual grasses remaining in the pasture uplands; it does not assess the impacts to native and/or rare species and habitats. RDM can be used most effectively during a drought year, but is of little value during "normal" years. Maintaining cattle numbers within the prescribed stocking levels for normal years (Table 9) should ensure that RDM meets the minimum standards outside of the ¼ mile boundary from water sources in most of the pastures.

Although the use of RDM would be de-emphasized under this alternative, RDM would be used to set stocking rates in pastures during drought years. The minimum RDM would be raised from 400 pounds per acre to 1000. Fall-winter precipitation determines the growth of annual grasses the following winter-spring. If, by April, rainfall data indicate a drought year, then RDM monitoring would be conducted to help determine summer stocking levels. RDM monitoring would then be conducted again in the fall to help determine winter stocking levels. Cattle would be removed from a pasture when the average RDM for that pasture falls below 1000 pounds per acre.

Monitoring Monthly AUM's by Pasture

The original "scorecard" stocking rates set by Bartolome and Clawson (1992) in the Range Management Plan would instead form the basis for the stocking reductions prescribed in this plan (Table 9). The yearly maximum stocking levels for each pasture would be incorporated as conditions in the new Special Use Permit. In order to monitor compliance with these maximum stocking levels, the permittee would be required to report monthly livestock (cattle and horse) head-days to the Park.

Construction of Enclosures

Two enclosures would be built in 1998: one in Box Canyon, and one in Jolla Vieja Canyon. The permittee would bear responsibility for building and maintaining the enclosure fences. For each enclosure, the Park would conduct any necessary environmental reviews of the impacts of fence construction and maintenance, including possible effects on cultural resources such as archeological sites. The Park would assure compliance with Section 106 of the National Historic Preservation Act and other applicable laws.

In Wire Field Pasture, a small enclosure would be built in upper Box Canyon to protect the following species: *Lilium humboldtii* (only known Santa Rosa Island location), *Typha domingensis* (cattails), *Quercus agrifolia*, *Pinus torreyana*, *Rosa californica* (only known Santa Rosa Island location). Currently, cattle loiter in the stream both above and below the waterfall. This causes trampling and predation of streambank and in-stream vegetation, including the *Typha*, destabilization of stream morphology, and decreased water quality. Additionally, cattle loiter under the oak trees, causing large bare areas which are sensitive to erosion during flood events. Regeneration of the oaks and other species is prevented by the trampling, grazing/browsing, and soil disturbance. This is the only spot on the island where *Lilium* is known to occur, despite widespread suitable habitat. The riparian/oak woodland is also extremely restricted in its island habitat; Lobo Canyon is currently the only other site.

In South Pasture, a small riparian enclosure would be built in Jolla Vieja Canyon to protect the remnant riparian woodland habitat from impacts of grazing, and to allow active restoration. The

exclosure would protect one half-mile stretch of stream, or about 40 acres. Approximately 1.5 miles of fencing would be required.

Restoration

The NPS would undertake a number of actions to restore native plant communities and rare species on Santa Rosa Island. Actions to be undertaken are:

- Seed banking of proposed plant species
- Control of invasive alien plants in sensitive habitats
- Testing of fire as a tool for restoration of native plant communities
- Restoration plantings of *A. hoffmannii*, *A. confertiflora*, *Dudleya greeneii* forma nova, *Dudleya candelabrum*, *Quercus tomentella*, *Pinus torreyana* ssp. *insularis*, *Populus trichocarpa* ssp. *balsamifera*, *Sambucus mexicana*, *Salix lasiolepis*, *Heteromeles arbutifolia*, *Quercus agrifolia* var. *agrifolia*
- Erosion control in sensitive habitats

It is likely, assuming continuation of existing funding levels, that NPS would have adequate funds to undertake the above actions. Implementation of additional desirable actions, such as large-scale erosion control, growing and transplanting of rare species, and more extensive control of alien plants, would be contingent on receiving additional funds or other assistance.

As per the recommendations included in the biological opinion from USFWS regarding these proposed actions, NPS will undertake the following mitigation actions for species proposed for listing as endangered under the Endangered Species Act:

- Alien plant control in *Castilleja*, *Phacelia* and *Arabis* habitat
- Erosion control in *Arabis*, *Arctostaphylos* and *Malacothrix* habitat
- Monitoring of *Malacothrix* populations; construction of cattle exclosures if cattle impacts are detected
- Monitoring of *Arctostaphylos* populations for browse damage, to quantify the effects of deer removal
- Submission of an annual report to USFWS on the above, along with a report on cattle utilization by pasture

Monitoring

Rare Plant Monitoring

Rare plant monitoring protocols are currently being developed by Kathryn McEachern, Research Ecologist, U.S.G.S Biological Resources Division, Channel Islands Field Station (McEachern 1996, McEachern et al. 1997). Current methods focus on surveys for populations of rare species, and demographic monitoring (population density, size-class sampling) for selected species. The terrestrial monitoring program at Channel Islands National Park would assume responsibility for monitoring rare plant species on Santa Rosa Island. Appropriate monitoring would be conducted for all listed species, depending on such factors as known distribution, immediacy of threats, etc.

Water Quality and Riparian Areas

The Park is currently working with the NPS Water Resources Division to shift its Santa Rosa Island water quality monitoring from a limited program monitoring compliance with water quality standards to a comprehensive program focused on documenting recovery of water quality values and riparian function. The Regional Water Quality Control Board has indicated its approval of the concept of such a shift in monitoring. Riparian monitoring will be designed to measure changes in the resource attributes that will document over time the progress in achieving the overall goal of improving streambank cover and stability to decrease bank and channel erosion. Monitoring protocols that will be adopted on selected stream segments will include the U.S. Bureau of Land Management's Greenline-Riparian Wetland Monitoring (BLM 1993) technique to monitor streamzone vegetation. Stream channel morphology and streambank stability measures as described by EPA (1993) will be used to monitor changes in channel depth and width, streambank cover, overhanging vegetation and streambank livestock utilization. Water quality values will continue to be monitored by synoptic sampling of fecal-indicator bacteria and nutrients. The Park would work with the RWQCB to ensure that the monitoring program meets applicable State standards.

Monitoring for Grazing Management

Residual Dry Matter (RDM) would be used to set stocking rates in pastures only during drought years. Compliance with the schedule of stocking reduction would be through monthly reporting of livestock utilization, by pasture.

Expanded Weed Management Program

The Park's weed management program would be expanded with the following actions: 1) development of a comprehensive weed management plan for the Park; and 2) implementation of a three year program to survey current weed infestations, research life-history characteristics of weeds, and prioritize weeds for control efforts, and test and evaluate control methods.

Development of Weed Management Plan

The Park's Plant Ecologist is currently developing a weed management plan for the Park. The plan will contain:

- a summary of current weed distribution and abundance on Santa Rosa Island, and on other Park islands;
- a summary of recent weed eradication efforts at Channel Islands National Park
- predictions for changes in weed distribution and abundance upon reduction of grazing
- prioritization of weed problems for management action, according to invasiveness, urgency of control, and feasibility of control
- description of methods and materials and equipment of choice
- standard operating procedures to prevent future weed introductions

Weed Surveys and Prioritization

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Channel Islands National Park will receive three-year project funding beginning in fiscal year 1997 to survey current weed infestations, research life-history characteristics of weeds, and prioritize weeds for control efforts. A ranking system (Hiebert and Stubbendieck 1993) has been developed for resource managers to classify alien plants within a park according to the species' level of impact and its innate ability to become a pest. This information can then be weighed against the perceived feasibility or ease of control. The ranking system is designed to first separate the "innocuous" species from the "disruptive" species. The separation allows researchers to then concentrate further efforts on species in the disruptive category.

The system is also designed to identify those species that are not presently a serious threat but that have the potential to become a threat and which thus should be monitored closely. Finally, the system asks the Park manager and the ecologist to consider the cost of delaying any action.

In order to use this system, and to apply the results toward effective vegetation management, the Park needs to acquire background life history information on alien plants in the Park, map and describe their occurrences, and to compile data on their impacts on ecosystem processes and on control methods.

The Park will acquire background information on exotic species through literature reviews and consultations with weed control specialists and other land managers with exotic plant control experience. All of these species also occur over much of California and the West, so this information is widely applicable. The "Exotic Species Ranking System" will be applied to alien plants in the Park, the results evaluated, and control programs will be tested on a suite of the highest priority species. Results of these experiments will be assessed, and recommendations for further implementation will be made.

Herbicide Use

Annual herbicide use is expected to increase in the near future, as the Park expands its weed management program on Santa Rosa Island. Herbicide requirements are unknown at this time, since amount of herbicide required will depend upon the scope of the weed problem, the rate of eradication, and unknown effects of livestock removal. However, it is anticipated that an expanded weed management program would use 2-3 times the amount of herbicide currently used on an annual basis. This level of use would continue until all livestock are removed in 2011, since cattle are the primary source of soil disturbance and vector of alien weed seeds. A discussion of existing herbicide use follows.

In 1995 and 1996, the Park used a total of 8.7 gal of Roundup® Herbicide (Monsanto Co., St. Louis) and 8.5 gal of Garlon 3A® Herbicide (DowElanco Co., Indianapolis) on approximately 3000 acres on Santa Rosa Island in control efforts for thistles, fennel, tumbleweed, horehound and *Brassica* (Table 17). Application method is spot treatment, in which foliage of individual plants is sprayed with diluted herbicide, using a hand-held low-volume pump sprayer. To avoid spray drift, application is not attempted during periods of moderate to high winds, and plastic cones are affixed to the spray nozzle. Application is by certified pesticide applicators, and is done in accordance with the directions for use and precautions provided by the herbicide manufacturer, on both the herbicide label and material safety data sheet. The Park obtains annual NPS approval for specific pesticide use in the Park, and daily and annual pesticide use logs are maintained. Annual pesticide use is reported.

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Proposed herbicide use does not include any Class I or Class II controlled substances regulated under the Clean Air Act as ozone-depleting substances.

Table 17. Herbicide use on Santa Rosa Island, 1995-1996.

Herbicide	1995			1996		
	Amount	Acres	Target	Amount	Acres	Target
Roundup	--	--	--	8.7 gal	2000	thistles
Garlon 3A	4.0 gal	440	horehound fennel tumbleweed thistles	4.5 gal		<i>Brassica</i> fennel tumbleweed thistles

Weed eradication efforts would be focused on individual pastures as they are closed or reduced in stocking rate. Initial focus would be on Old Ranch and Carrington pastures, which are closed in 1997 and 1998, respectively. The next phase would focus on Pocket Field (closed in 2000) and North Pasture (closed in 2008).

Road Management Actions

The Park will implement the following road management practices:

- 1) The Park has developed and has implemented a protocol for road use during bad weather - specifically, no road use will occur. Every operator of a vehicle on the island must be drive-tested and approved by the resident island Ranger or maintenance person regardless of past driving experience. Operators of heavy equipment must be licensed and approved through the Park’s Chief of Maintenance following extensive on-island training and evaluation. These actions will help minimize the need for road maintenance.
- 2) A road inventory is being developed using the Park’s geographic information system (GIS). This includes digitizing the island road system. The stream crossing data previously developed for the Clean Water Act Section 404 permitting process will be entered into the GIS. The location of the 28 miles of regraded/repared roads will be entered into the GIS along with priorities for repair for remaining ungraded road sections.
- 3) In 1993 the Park purchased a \$125,000 road grader. Prior to that the Park had only a small bulldozer to repair roads, which was inadequate to properly grade roads. A WG-11 Equipment Operator was hired, and to date he has resloped and regraded approximately 28 miles of the island’s 54 miles of roads. Road grading will only occur during the spring of each year when soil moisture conditions are acceptable, so the annual time available to work on the roads is limited.
- 4) All roads are being outsloped whenever possible, according to 1992 recommendations from a hydrologist. Park staff try to avoid inboard ditches and culverts whenever possible because of the higher degree of maintenance required.

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- 5) The Park has surveyed a proposed route for a by-pass for the most severely eroded and unrepairable section of the island road system, the beginning of the Smith Highway. A future environmental assessment will evaluate the benefits and impacts of such a road.
- 6) The Park has applied for and received from the U.S. Army Corps of Engineers an individual permit for the routine maintenance of 63 road stream crossings on Santa Rosa Island. The State Water Resources Control Board issued water quality certification for the project, subject to conditions recommended by the Central Coast Regional Water Quality Control Board. The Park will comply with all permit conditions.

Increased Visitor Access

Visitor access to Santa Rosa Island will be increased. Presently, unescorted visitors are restricted to the Water Canyon drainage, the beach at Beecher's Bay, and the road up to and including the Torrey Pines Grove. All other travel is prohibited unless escorted by a Park Ranger. Under this proposed action, this restriction would be lifted. Visitors would be allowed to travel unescorted to all parts of the island, with the following exceptions:

- 1) Skunk Point beaches are closed to public access March 1 to September 15 to protect nesting western snowy plovers, as per USFWS biological opinion.
- 2) Camping on beaches is seasonally restricted for protection of seabirds, pinnipeds and plovers, as per Park beach camping plan.
- 3) The reserved area of the main ranch at Beecher's Bay (approximately 8 acres), as specified in the deed of sale, is only open to visitation under Ranger escort. The remaining barn structures are accessible with Ranger permission
- 4) During periods of the elk and deer hunt, visitation to certain portions of the island may be temporarily restricted for reasons of public safety.
- 5) Sandy Point is closed year round for resource management concerns.
- 6) Campers are required to obtain a camping permit from the Park. All camping (with the exception of beach camping) must be in an established campground. Currently there is only one established campground, at Water Canyon.

Table 18. Implementation schedule for Alternative D, Revised Conservation Strategy.

Year	Action
1997	Close Old Ranch Pasture to cattle and horses Begin deer and elk reduction
	Begin tracking monthly cattle and horse AUM's by pasture
1998	Close Carrington Pasture to cattle and horses Reduce AUM's in Pocket Field to 50% of scorecard Reduce AUM's in North Pasture to 75% of scorecard Continue deer and elk reduction
	Construct exclosures in Box Canyon and Jolla Vieja Canyon
1999	Reduce AUM's in Pocket Field to 50% of scorecard Reduce AUM's in North Pasture to 50% of scorecard Continue deer and elk reduction
2000	Close Pocket Field to cattle and horse grazing Remove remaining deer from island Continue elk reduction
2001	Reduce AUM's in North Pasture to 25% of scorecard
2002	Continue elk reduction
2003	Continue elk reduction
2004	Continue elk reduction
2005	Continue elk reduction
2006	Continue elk reduction
2007	Continue elk reduction
2008	Close North Pasture to cattle and horse grazing Reduce AUM's in South Pasture to 75% of scorecard Continue elk reduction
2009	Reduce AUM's in South Pasture to 50% of scorecard Continue elk reduction
2010	Reduce AUM's in South Pasture to 25% of scorecard Continue elk reduction
2011	Close South, Wire Field, Lobo, Wreck Trap and Arlington Beef Trap pastures to cattle and horse grazing Remove remaining elk from island

ALTERNATIVE E. IMMEDIATE REMOVAL OF UNGULATES

Immediate Removal of Non-native Ungulates, Expanded Weed Management Program

Targeted Pastures: All

Under this alternative, NPS would improve water quality and riparian values and promote the conservation of rare species by the immediate removal of all non-native ungulates from Santa Rosa Island.

Immediate Removal of Non-native Ungulates

The permittee would have three years in which to remove all cattle, horses, elk and deer from Santa Rosa Island. Although choice of removal method would be left to the discretion of the permittee, NPS would oversee the removal efforts to insure no impact to other resources, and to insure safety of visitors and staff. The permittee would be required to submit a detailed removal plan, with timetable, subject to NPS approval.

Monitoring

Appropriate monitoring of water quality and riparian areas would be conducted.

Expanded Weed Management Program

Under this alternative, the Park's weed management program would be expanded as described under Alternative D, Revised Conservation Strategies (The Proposed Action).

Table 19. Implementation schedule for Alternative E, Immediate Removal of Ungulates.

Year	Action
1997	Permittee begins removal of all ungulates from SRI NPS begins comprehensive weed management program
1999	Permittee completes removal of all ungulates from SRI

AFFECTED ENVIRONMENT

NATURAL RESOURCES

Physical Setting and Geology

Located about 15 miles south of Santa Barbara, California, the 54,000 acre Santa Rosa Island is one of five islands that comprise Channel Islands National Park. With the 1574 foot Soledad peak at its hub, a highly-dissected, radial drainage network has evolved on the island. There are 16 second order intermittent and perennial drainages on the Island, including Windmill Canyon, Cherry Canyon, Water Canyon, Quemada Canyon (includes Old Ranch Canyon), San Augustine Canyon, Wreck Canyon, Jolla Vieja Canyon, Trancion Canyon, Acapulco Canyon, Whetstone Canyon, Bee Canyon, Canada Garanon, Arlington Canyon, Soledad Canyon, Verde Canyon, and Canada Lobo.

The Island is divided by the Santa Rosa fault. On the northern side of the fault, the geology is composed of well-developed terrace deposits of mid-Tertiary marine clastics and volcanoclastics. The geology of the southern portion of the island is more complex, resulting from fracturing and complex faulting of Tertiary sandstones and shales, and mid-Tertiary clastics and volcanoclastics with volcanic intrusions (Weaver 1969).

Soils

Current knowledge of park soils is limited to a study by Johnson (1979), who conducted a cursory investigation of soils, geology and erosion problems on Santa Barbara, Anacapa, and San Miguel Islands. Santa Rosa and Santa Cruz Islands were not surveyed. Soils generally range from fine sandy loams to clay loam, and are easily erodible.

The soils of Santa Rosa Island have not been adequately surveyed. A preliminary overview of the soils showed that soil textures range from fine sandy loam to clay loam, with the clay content of many areas being high enough that the soils exhibit shrink-swell characteristics. On gentle grass covered slopes, these soils are generally thick and dark brown in color with a relatively high organic matter content.

Soils in this area are highly erodible. Low levels of organic matter and very limited, if any, soil freezing results in compactible soils with slow dilation rates. Compaction of soils results in less water infiltration, increased runoff, and less locally available water (Webb, 1983; Wilshire, 1983), which in turn influences soil biota activity, N cycle dynamics (Torbert and Wood 1992), vascular plant vigor and reproduction (Crawford 1979; Skujins 1984) and decomposition rates of soil organic matter (West 1981). Soil aggregates and pore space, important for soil stability, infiltration and as microenvironments for soil biota, are reduced by compaction (Dregne, 1983; Stolzy and Gundy 1968).

Surveys of cyanobacterial soil crusts on the Channel Islands show that these crusts should cover the soil surface in most of the vegetation types (Belnap, 1994b; pers. obs.). However, these crusts did not evolve under grazing pressure (Mack and Thompson, 1982), and are impacted by

soil surface disturbance, including grazing (Harper and Marble, 1988; Jeffries and Klopatek, 1987), people and off-road vehicles (Cole, 1990; Belnap et al., 1994; Belnap, in press). Crusts on the Channel Islands are especially susceptible to impacts from hooved animals (Belnap, pers. obs.). These crusts are important for increased soil stability, water infiltration, and fertility of soils (Harper and Marble, 1988; Johansen 1993; Metting 1993; Belnap and Gardner, 1993; Evans and Ehrlinger, 1994; Belnap, 1994a; Belnap et al. 1994). Absence of these crusts can lead to increased erosion, with resultant loss of organic matter, fine soil particles, nutrients and microbial populations in soils (Schimel et al. 1985).

Normal nutrient cycles can also be disrupted by soil surface disturbance. Experiments have demonstrated that all types of surface disturbance tested dramatically decreased nitrogenase activity in these crusts (Belnap et al., 1993; Belnap, in press). Plants growing in crusted areas have significantly more nitrogen in their tissue than plants growing in trampled areas without crusts (Belnap and Harper, 1995; Harper and Pendleton, 1993). Cyanobacterial-lichen soil crusts are also an important source of fixed carbon for sparsely vegetated areas (Beymer and Klopatek, 1991). In addition, soil disturbance can alter soil food webs and thereby affect nutrient availability in these systems (Ingham et al., 1989). Disruptions of soil food webs can reverberate throughout the ecosystem, affecting macro-floral and faunal components (Hendrix et al., 1992; Coleman et al. 1992). Recovery is extremely slow, taking 100-150 years for soils to dilate, and over 250 years for crusts to fully recover (Webb and Wilshire, 1980; Belnap, 1993).

Plant community composition and architecture can also be affected by soil surface disturbance. Changes in these critical habitat components has been shown to affect invertebrate and vertebrate populations (MacMahon 1987).

Cattle and, formerly, sheep and alien pigs have accelerated soil erosion and increased slope failures on Santa Rosa Island. The NPS has analyzed a 5 meter / 5,200 year-old soil core collected in 1989 from a small estuary at the eastern end of the island (Cole and Liu 1994). The core showed an increase in sedimentation rates from an average of 0.7 mm per year for the 5,000 year period prior to settlement (or the "background" erosion rates) to an average of 13.4 mm per year for the post settlement period. Sedimentation rates peaked from 1874 to 1920, at 23.0 mm per year.

Water Quality and Riparian Areas

There are 16 second order intermittent and perennial drainages on the Island, including Windmill Canyon, Cherry Canyon, Water Canyon, Quemada Canyon (includes Old Ranch Canyon), San Augustine Canyon, Wreck Canyon, Jolla Vieja Canyon, Trancion Canyon, Acapulco Canyon, Whetstone Canyon, Bee Canyon, Canada Garanon, Arlington Canyon, Soledad Canyon, Verde Canyon, and Canada Lobo. The majority of the streams and their associated riparian areas on Santa Rosa Island are in poor condition.

Many of the stream reaches are deeply incised. This is probably the result of thousands of years of development of arroyo systems, which are common in the southwestern United States (Schumm 1977, Bull 1979, Harvey et al. 1995). This process likely intensified during the 19th Century when sheep grazing reached its peak. Continued cattle grazing has prevented recovery. Consequently many stream reaches are deeply entrenched.

Riparian vegetation is influenced by stream channel morphology. The riparian zone in the upper reaches of Santa Rosa Island streams is usually very narrow. Consequently, vegetation adjacent to the streams in these reaches tends to be dominated by upland trees, shrubs, grasses, and forbs which take advantage of the extra water the stream provides. Toyon (*Heteromeles arbutifolia*), coast live oak (*Quercus agrifolia*), island oak (*Q. tometella*) most likely represent the canopy of the potential natural community for the upper reaches of streams. The herbaceous understory for these reaches includes miner's lettuce (*Claytonia perfoliata*), goldenback fern (*Pityrogramma triangularis*), California polypody (*Polypodium californicum*), and western brackenfern (*Pteridium aquilinum* v. *pubescens*). Upper Lobo Canyon is the best example of this community type. However, most drainages lack many of the tree and shrub species found in Lobo. In many cases the riparian areas associated with upper reaches of streams are dominated by non-native annual grasses, leaving little difference between these areas and adjacent uplands.

As the slope of the stream decreases and the streams become more winding, the riparian area broadens. Point bars form where sediments are deposited. These bars provide the substrate for an array of tree, shrub, and herbaceous species. Cottonwood (*Populus fremontii*), arroyo willow (*Salix lasiolepis*), elderberry (*Sambucus mexicana*), California wild rose (*Rosa californica*), Southern California blackberry (*Rubus ursinus*), and poison oak (*Toxicodendron diversilobum*) form the overstory. Saltgrass (*Distichlis spicata* ssp. *stolonifera*) Douglas' baccharis (*Baccharis douglasii*), waterbent (*Agrostis semiverticillata*), brass buttons, (*Cotula coronopifolia*), Bermuda grass (*Cynodon dactylon*), common monkey flower (*Mimulus guttatus*), and Rabbit's foot grass (*Polypogon monspeliensis*) form the understory. Again, portions of Lobo Canyon are the best examples of this community type.

However, the lower reaches of most streams are heavily impacted by unrestricted cattle grazing, and consequently are devoid of all woody and shrubby species, and in some cases of any vegetation at all. The use of the continuous grazing system has been particularly detrimental to many riparian areas on the island because there is no opportunity for plants to recover from the effects of defoliation and trampling (Kinch 1989). Vegetative cover along stream banks is important because it reduces the erosive energy of water (especially during flooding), reduces the velocity of water, and traps suspended sediments. Without proper vegetative cover, stream banks are unstable. Unstabilized stream banks easily erode into the stream column, causing the stream's width to increase. With the increased width, the depth of the water column decreases. This in turn leads to increased stream temperatures and a decline in the quality of habitat for insects, amphibians, and other wildlife.

Unrestricted cattle grazing along the streams of Santa Rosa Island has led to the selective browsing of riparian plants, such as willows. This caused major decreases in reproduction and survival of riparian species. In many cases where there are willows present, the plants have been browsed into tree-like forms, an indication of extreme browsing pressure. In most cases existing willow plants are decadent and there is no recruitment. Within Lobo Canyon there are three cottonwood trees, the only ones left on the island. These trees are so old that they have not flowered in over three years. It is not known what gender the trees are. It is possible they are all the same sex (either male or female). If this is the case, then natural reproduction of cottonwoods may have already been lost.

In March 1995 an interdisciplinary team assessed several streams on Santa Rosa Island. Using methodology developed by the Bureau of Land Management (BLM) segments of streams were

assessed based upon hydrologic, vegetation, and erosion/deposition criteria (Rosenlieb et al. 1995). The team found the vast majority of the streams to be non-functional in dissipating flood water energies, trapping sediments, and forming/maintaining adequate riparian habitat. Lobo Canyon was one exception, receiving a rating of "proper functioning condition" (PFC). Although the team found a number of problems with the streams on the island, the team determined that the streams, as a whole, were vertically stable and no longer downcutting. This is an important determination, because it means the restoration potential of the streams is excellent with proper grazing management.

Since October 1993, the Park has been monitoring water quality at a number of sites within the Lobo, Water, and Quemada (Las Cruces) drainages. Water quality in the streams on the island reflect the lack of a functioning riparian community and the impacts of grazing by cattle (Sellgren 1995). With no riparian vegetation to slow water flows down and capture excess water for later release into the stream, stream flows tend to dramatically peak during storm events. Summer flows tend to be very low, most likely lower than what would be expected if there was adequate riparian vegetation. The lack of riparian vegetation also leads to increased sediment transport during storm events. Total suspended sediment levels have been recorded at thousands of times of baseline levels during moderate storm events (less than one inch of precipitation in 24 hours). The scarcity of shrubby and woody riparian vegetation to shade the stream waters leads to high peak water temperatures. Conductivity, salinity, pH, and total dissolved solids levels indicate that many of the streams on SRI have alkaline properties. The alkalinity of the streams is most likely unrelated to grazing activity, past or present. Dissolved Oxygen levels indicate super-saturated levels during the day. This may reflect release of Oxygen into the stream column by *Cladophora* algae. Predawn measurements of dissolved Oxygen indicate that levels are suppressed before sunrise. This further supports the impacts of the algae population. Finally, coliform levels indicate that in the streams monitored there is a serious pollution problem associated with cattle feces. Most sites monitored have consistently failed to meet the standards for water contact recreation. Increased use by cattle in the immediate vicinity of a water quality monitoring site has frequently led to substantial increases in the total and fecal coliform levels.

Santa Rosa Island contains both coastal wetlands (shallow lagoons and river mouths subject to periodic inundation by tides) and vernal freshwater wetlands (vernal pools). Santa Rosa has three coastal wetlands on its east end and a very small coastal wetland that frequently forms at the mouth of Arlington Canyon. The largest coastal wetland on the east end of Santa Rosa Island is at the mouth of Old Ranch House Canyon. It contains a lower estuarine marsh and a vernal high marsh. The lower estuarine marsh is separated from the ocean by a sand spit. Ocean water enters the marsh during storms, extreme high tides, and periods when the sand spit is incomplete. The high marsh is the result of deposition of sediments from the drainage basin.

On Santa Rosa Island, Clark, et al (1990) recorded the following dominant plant taxa at the coastal wetlands: Saltgrass (*Distichlis spicata* var. *stolonifera*) pickleweed (*Salicornia virginica*), alkali-heath (*Frankenia salina*), alkali weed (*Cressa truxillensis*), foxtail (*Hordeum murinum* ssp. *leporinum*), ripgut brome (*Bromus diandrus*), and *Jaumea carnosa*. They noted that "*Distichlis spicata* var. *stolonifera* formed a loose, ground cover into which the *S. virginica* interweaved, forming a matrix that either *F. salina* or *J. carnosa* penetrated." Soil moisture and organic matter were higher than the adjacent areas and soil texture was clay loam.

Increased sedimentation to the marsh has raised its surface level by approximately 1 m. (3 ft.) since the beginning of ranching in the 1840s (Cole and Liu 1994). As a result, the high marsh has experienced increasingly long periods of dryness and is becoming less able to support wetland vegetation. The marsh is moving towards support of upland vegetation, a trend which is likely to increase the abundance of non-native weeds. A proliferation of bull thistle, milk thistle, and spiny cocklebur occur already.

Following the extremely heavy rains of early 1995, the road and cattle trails diverted runoff into channels that caused considerable headcutting into the upper marsh. This recent increase in erosion is removing the sediments that have been deposited as a result of the road. Therefore, the average level of the marsh is now lowering back towards its pre-ranching era elevation.

In Pocket Field Pasture, vernal pools are located west of Garanon Canyon. In Old Ranch Pasure, vernal pools are located near Skunk Point and Abalone Rocks. In a survey of vernal pool invertebrates, Furlong (1996) observed that the vernal pools in Pocket Field to be heavily impacted by cattle grazing, with cattle observed utilizing the pools during the survey. Furlong noted that cattle may negatively impact vernal pools by trampling bank vegetation, walking through pools, standing/urinating/defecating in pools, and introducing weedy species. Vernal pools are a rare and threatened habitat type in California.

Vegetation

Vegetation Communities

The vegetation of Santa Rosa Island can be divided into three general formations: 1) grasslands, 2) shrublands, and 3) woodlands. Each of these formations have both upland and riparian expressions. This section discusses the upland plant communities. Riparian communities are discussed in the previous section. Vegetation formations are divided into communities based on the presence of key species or on the combination of species present. Clark et al. (1990) discuss 15 plant communities on the island, providing much of the baseline understanding of island ecosystems.

Of approximately 8000 plant species occurring in California, nearly 500 occur on Santa Rosa Island. While the majority of these are quite common and widespread throughout the state, there is also a significant number of species that are unique to Santa Rosa Island, the Channel Islands, and the nearby mainland. Ten species with current or historical occurrences on Santa Rosa Island are proposed for listing as Endangered by USFWS. Detailed discussions of these plants and their habitats may be found in the Federal Register (1995) and Coonan et al. (1996).

Currently, island vegetation is dominated by grasslands, which cover about two-thirds of the island's surface. The grassland community is composed primarily of alien annuals such as wild oats (*Avena* spp.), wild barley (*Hordeum*), and chess (*Bromus* spp.). Common herbs in this community are also alien annuals, such as burclover (*Medicago polymorpha*), and include such invasive species as milk thistle (*Silybum marianum*), tocalote (*Centaurea melitensis*), and spiny cocklebur (*Xanthium spinosum*). Native perennial grasses on the island are needlegrass (*Nasella*, a bunchgrass genus) and saltgrass (*Distichlis spicata*, a rhizomatous species). The current

scattered distribution of these native perennials across the island, occurring on several soil types, may be a remnant of a formerly more continuous distribution.

Few of the USFWS proposed plant species are known to occur in grasslands. Expansion of annual grasslands into areas that formerly supported shrublands (Minnich 1980, Hobbs 1983) may have significantly reduced populations of plants that are now considered endangered. Species which are now found in habitats less accessible to grazers may have occurred in grassland prior to the introduction of livestock and alien wildlife

Shrublands, made up of chaparral and six other scrub communities, cover about 25% of the island. The woody vegetation ranges from just a few inches to several feet in height. Vegetative cover may be almost non-existent in some dune and bluff scrubs or may approach 100% in chaparral. Reproduction of shrub species is low to nonexistent in many of the communities. This, in combination with browsing, has led to a decrease in cover of key species. As woody cover decreases, so does the litter layer on the ground below, allowing herbaceous species to colonize the exposed soil. The herbaceous understory in all the communities is dominated by alien species. Nevertheless, native grasses and herbs do persist, frequently nestled beneath the canopy of established shrubs (Clark et al. 1990). Coastal sage scrub and chaparral (characterized by *Artemisia californica* / *Baccharis pilularis* and *Adenostoma fasciculatum* var. *fasciculatum*, respectively) are the most common shrub communities and are widely scattered on the island. Other communities are much more restricted. Caliche scrub, characterized by goldenbush (*Isocoma menziesii* var. *sedoides*) and locoweed (*Astragalus miguelensis*), occurs only in Pocket Field; lupine scrub, characterized by *Lupinus albifrons* and *L. arboreus*, occurs only at Carrington Point. Coastal bluff scrub, coastal dune scrub, and chaparral scrub are also limited in distribution.

Native woodland and shrubland communities, which are the communities primarily utilized by deer for feeding and bedding, are probably in decline. Loss of soil is particularly apparent. There are extensive areas of bare ground in these communities, far beyond that expected or observed in areas not subject to this type and intensity of disturbance. The litter layer is at or near zero in many areas. Ungulate trails have been worn to bare rock. Newer trails are deeply grooved in the soils. Pedestals of soil protrude in protected areas between trails. Native plant habitats are extremely fragmented. There are large components of non-native species in the native plant communities. Both the releve (Clark et al. 1990) and long-term vegetation community monitoring data (NPS, unpublished data) reflect these conditions.

The buds and flowering tips of woody species are nearly 100% browsed wherever they can be reached by ungulates. For some low-growing species, such as manzanita (*Arctostaphylos confertiflora*, *A. tomentosa* v. *subcordata*), there is no portion of the plant that is not browsed every year. Park and USGS-BRD botanists have never observed an accessible *Arctostaphylos* plant that was not heavily browsed. *Arctostaphylos* is the one of the key native plant species in the island chaparral.

There is a general lack of recruitment in woody species. Some individuals of closed-come pine have toppled, due to the undercutting effect of erosion at their bases.

In a number of areas "orphan" *Arctostaphylos* and *Jepsonia* plants occur in areas (now occupied by non-native grassland) surrounding degraded chaparral community. *Arctostaphylos* and

Jepsonia only occur in shrubland communities; they do not occur in grassland. These plants, which probably do not live longer than 30 years, likely represent the former extent of the chaparral community, which has retracted due to browsing and grazing pressures. Many areas of the chaparral community are in a degraded state and have been invaded by non-native grasses and forbs.

Shrub communities are highly significant because of both the overall number of plant species occurring there and the high number of listed and sensitive species found there. The coastal sage community, for example, is habitat for at least 103 species, three of which are proposed for listing. Chaparral is made up of over 80 species, six of which are proposed (Coonan et al. 1996). This richness is due to the environmental diversity and protection created by the woody species. Sustained representation of all age and size classes of these species is necessary to preserve the richness of these communities.

Woodlands are an ecologically important though uncommon component of the Santa Rosa Island vegetation. Altogether, upland and riparian woodlands account for less than 1% of the island's cover. Upland woodlands are dominated by pines, oaks, or other mixed hardwoods (oak, cherry, and/or ironwood). Eight native and three alien tree species occur on the island. Two of the native species, Island oak (*Quercus tomentella*), and ironwood (*Lyonothamnus floribundus* ssp. *asplenifolius*), are known to occur nowhere else in the world other than on the Channel Islands. Torrey pine (*Pinus torreyana* ssp. *insularis*) occurs only on Santa Rosa and a portion of the mainland near San Diego.

The alien trees, eucalyptus (*Eucalyptus globulus*), Monterey pine (*Pinus radiata*), and tamarisk (*Tamarix aphylla*), are currently confined to the ranch headquarters area. Native trees occur in discrete groves rather than being widely distributed across the landscape. There are two stands of Torrey pine and nine known groves of ironwood. Closed cone pines occur in two stands, in addition to several isolated individuals. Island oaks have a somewhat broader distribution, occurring in 17 groves. Willows (*Salix lasiolepis*) and cottonwoods (*Populus trichocarpa*) occur in a few riparian areas, the three cottonwood trees on the island being confined to a single drainage. Holly-leaf cherry (*Prunus ilicifolia* ssp. *lyonii*), toyon (*Heteromeles arbutifolia*), and scrub oak (*Quercus pacificus*) occur occasionally as understory trees in the mixed hardwood community. Shrub and herbaceous understories are generally sparse; the herbaceous layer is composed mostly of alien species. Reproduction of the tree species is minimal in most stands. An exception to this is the Torrey pines, where significant recruitment is occurring. It is believed that the native trees currently occupy most of their potential range (Clark et al. 1990) Fragmentation within that range and lack of structural diversity within the stands threaten continued viability of these communities.

The original research work to establish the monitoring program (Clark et al. 1990) found that populations of native perennial grasses, woodland and scrub communities are highly fragmented and depauperate:

...Coastal Sage Scrub, is particularly vulnerable to the long-term effects of grazing...In addition to the loss of biomass from direct browsing, many of the native species off this community suffer reproduction impairment under heavy grazing, causing these taxa to be unable to maintain populations through periods

of prolonged grazing...[this] reveals a strong inversion relationship between animal disturbance and species diversity and shrub canopy cover.

There is only one location on the island where a portion of Coastal Sage Scrub community is completely inaccessible to any ungulates, due to deep erosional gullies surrounding it. Here Clark, et al. (1990) found that the community was intact, non-fragmented, functional, and had low amounts of bare ground, high native plant diversity, and only a small proportion and diversity of non-native plants.

Increased levels of grazing and browsing were correlated with decreasing species diversity, increasing importance of alien species, and increased bare ground and open space between shrubs (Clark et al. 1990).

Woodland communities have highly disturbed soil surfaces, depauperate woody and herbaceous understories, little litter accumulation, and much soil surface erosion. Litter layers under the Island Oaks inside the cattle enclosure on Soledad Peak have increased; while those under oaks just outside the enclosure have decreased.

See Appendix D for photos of examples of landscape change over time on Santa Rosa Island.

Alien Plants (Weeds)

In contrast to sensitive plant species, which the Park is charged with conserving, alien pest plants (or weeds) are a component of island vegetation that is managed for reduction or elimination. For the purposes of this document, weeds are defined as invasive non-native plants taking up space and resources that could be utilized by native species.

On Santa Rosa Island, pest species can be categorized by three broad behavior types: 1) opportunistic species that rapidly colonize available habitat, 2) slow spreading species that are very persistent once established, and 3) omnipresent species that have replaced native plant communities over large areas.

Opportunistic species of concern are bull thistle (*Cirsium vulgare*), milk thistle (*Silybum marianum*), Russian thistle (*Salsola iberica*), and spiny cocklebur (*Xanthium spinosum*). These species have seeds that are dispersed over long distances by wind or animals. Because of this, the direction of dispersal is random and unpredictable. New seedlings readily establish in any bare soil, such as road sides, construction sites, streambanks, animal trails, and salt grounds. "Explosions" of these plants may occur in years when favorable weather coincides with availability of disturbed habitat. These four species are currently increasing on Santa Rosa Island, in size, number, and range of populations. Bull thistle, milk thistle, and spiny cocklebur occur island-wide, as scattered individuals and in large patches. Russian thistle currently occurs on approximately 20 acres near Officers' Beach and is spreading to the north and northwest. All of these species have the potential to form dense monotypic stands, completely excluding native island species. None of these species are known to be preferred forage for wildlife or livestock. All may be effectively controlled through a combination of herbicide applications and physical removal. Due to their potential for rapid population growth and domination of plant communities, these species are high priorities for immediate and ongoing control.

Slow spreading, persistent weed species include fennel (*Foeniculum vulgare*), lavatera (*Lavatera cretica*), black mustard (*Brassica nigra*), tamarisk (*Tamarix aphylla*), kikuyu grass (*Pennisetum clandestinum*), rice grass (*Piptatherum miliacea*), tall fescue (*Festuca arundinacea*), and Bermuda grass (*Cynodon dactylon*). While these species also have the ability to form dense populations, they may take several years to reach this condition. Their seeds are generally larger and heavier than the opportunistic species, and are spread through animal feces or in mud on vehicle tires or animals' feet. These species occur predominately around the Beecher's Bay dock and ranch area, though black mustard is ubiquitous throughout island grasslands. Individuals of fennel and tamarisk have been found on other parts of the island and have been eliminated by physical removal. Eradication of fennel in the ranch area is currently being pursued through herbicide applications and physical removal. Fennel and black mustard are readily grazed by livestock, which serves to simultaneously control them, by keeping their height down and reducing flowering, and to spread them, through seed dispersal in feces. Because of their concentrated range and slow rate of spread, all these species except black mustard are good candidates for complete eradication.

Some alien plant species have become extremely widespread, replacing thousands of acres of native grasslands and shrublands. These species are primarily annual grasses and herbs and are included in the discussion of island communities. Many provide forage for cattle, horses, and elk. Chemical and physical control of these species is currently unfeasible due to their widespread presence.

Both the Vail & Vickers Co. and the National Park Service engage in weed control efforts. The ranching operation has worked to prevent introduction of weed species to the island through careful inspection and quarantining of all incoming animals that may carry seeds in their coats or digestive tracts (Sellgren, pers. comm., 1996). The ranch has also practiced physical removal of some weeds. Park staff has generally focused their efforts on eradicating exploding populations and new occurrences in disjunct locations. Current funding levels for weed control on Santa Rosa Island are inadequate to pursue an effective weed management program.

Forage Production and Availability

Santa Rosa Island is dominated by grasslands. The majority of the grasslands consist of annual grasses, although Santa Rosa Island contains some of the best perennial grasslands left in southern or central California. Annual grasses are adequate forage. They make better forage in the winter, when they are tender, green, and palatable. After the annual grasses set seed and die in the late spring, they cure. Cured grasses are less palatable. If there are early summer rains, many of the nutrients can be leached out.

Perennial grasses also make good forage. Unlike annual grasses, perennial grasses live for several years. During the summer drought, many perennial grasses go dormant. On Santa Rosa Island most perennial grasses continue to grow throughout the summer, taking advantage of the summer fog drip. During the summer months, when annual grasses are all cured, cattle prefer the perennial grasses and utilize them heavily.

Overall, Santa Rosa Island produces considerable amounts of forage. Results from the range monitoring program indicate that several thousand pounds of forage per acre can easily be

produced in an average rain year. Some sites produce well above what is considered "normal" for its range site. One type of range site, which performs poorly, are those areas with heavy clay soils. Monitoring sites on heavy clay soils have consistently had problems producing adequate forage. These sites are not common on the island.

Utilization of forage on Santa Rosa Island is patchy and irregular, due to the current grazing system of continuous use in large pastures, with no measures to regulate distribution of cattle. Areas far from water tend to be underutilized, while areas near water tend to be overutilized. Because the pastures are so large, and water developments are so few, cattle are forced to obtain their water from the streams. Once there, the cattle take advantage of any green forage available and rest in the shade created by the incised banks. It is important to emphasize, however, that Santa Rosa Island is not overstocked; there are adequate amounts of forage to support the number of animals currently on the island. Problems lie in the control of the distribution of the cattle.

In Western rangelands, riparian areas, and in some cases grasslands near streams or water developments, tend to be overgrazed. Most riparian areas on Santa Rosa Island are devoid of any vegetation whatsoever. The poor condition of riparian areas has led to a loss of forage in this community. Riparian areas tend to be some of the most productive range; Bartolome and Clawson (1992) estimated 2000 lb./ac of available forage in healthy riparian areas. However, very few riparian areas on Santa Rosa Island appear to be capable of producing this amount of forage.

Wildlife

Compared to the flora, the fauna of Santa Rosa Island is not well known.

Mammals

Santa Rosa Island supports four species of native mammals. The largest is the island fox (*Urocyon littoralis santarosae*), which is distributed over the entire island. Distinct subspecies of island fox have been identified for each of the six largest Channel Islands. The entire species is officially listed by the State of California as threatened and by the U.S. Fish and Wildlife Service as a candidate for federal listing as threatened or endangered.

Channel Islands spotted skunks (*Spilogale gracillis amphiala*) are known to inhabit brush and woodland areas, and have also been found in association with buildings. This subspecies of spotted skunk exists only on Santa Cruz and Santa Rosa Islands, having been extirpated from San Miguel Island. The skunk is listed as a “Species of Special Concern” by the State of California and has been designated by the U.S. Fish and Wildlife Service as a candidate for federal listing as threatened or endangered. The Channel Islands spotted skunk may currently be limited in distribution and may exist at low population levels on Santa Rosa Island. According to von Bloeker (1967), spotted skunks were once very common on Santa Cruz and Santa Rosa Islands, but by 1967 they were rarely found on either island, at least near human dwellings. Possible continued threats to skunks include habitat loss and severe habitat degradation due to overgrazing and associated damage to habitat by both domestic stock and introduced deer and elk. The apparent rarity of spotted skunks may reflect normal population fluctuations, or it may reflect a real decline in numbers (Williams, 1986).

Each of the Channel Islands has its own subspecies of deer mice. The deer mice (*Peromyscus maniculatus santarosae*) population on Santa Rosa Island is distributed widely; however, very little is known about their basic biology, ecology, and population status.

By far the most dominant feature of the island fauna is introduced species. In the last half of the 19th century the island was used as a sheep ranch, and much of the loss of vegetation and soil stems from this period of the island’s history. While the pigs and feral sheep have been removed, four species of alien animals continue to graze and browse the island’s vegetation. These are elk (*Cervus elaphus*), mule deer (*Odocoileus hemionus*), and domestic cattle and horses. Vail & Vickers maintain approximately 3,000-5,000 cattle, 700-800 deer, 125-150 horses, and 600-1,000 elk on the island.

Reptiles and Amphibians

Three species of reptiles are found on Santa Rosa Island. Western fence lizards (*Sceloporus occidentalis*) and southern alligator lizard (*Gerrohontus mullicarinatus*) are found in scattered areas throughout the island.

The endemic Santa Cruz gopher snake (*Pituophis catenifer pumilis*) has been recorded on Santa Cruz and Santa Rosa Islands and is found in a wide variety of habitats on the island, but their numbers are low on Santa Rosa Island. Grazing by ungulates may have both direct and indirect effects on snake populations. Grazing decreases shrub cover and maintains open annual grasslands on the island, in contrast to the shrub communities which occurred historically on the island. This decrease in vegetative cover may substantially increase the risk of predation for gopher snakes. The prey base for the snake may also be substantially affected by changes in vegetation communities caused by grazing. Two species of amphibians inhabit Santa Rosa Island. The Pacific tree frog (*Hyla regilla*) is found in all canyons that have standing pools or slow moving streams. The Pacific slender salamander (*Batrachoseps pacificus major*) is commonly found in moist canyon settings, but can also occur in other areas with suitable moisture and cover.

Landbirds

At present, 30 species of land birds are known to breed or may potentially breed on Santa Rosa in the future (Diamond and Jones 1980). Many of the resident species on Santa Rosa Island are recognized as endemic subspecies distinct from their relatives on the mainland and other islands. Areas of special concern to these and other land birds include all island oak stands, the Torrey pines especially for future nesting of bald eagles, Lobos Canyon, the estuary area, and the thick scrub and mixed woodland areas of Cherry Canyon, Water Canyon and Windmill Canyon. Santa Rosa Island is also an important wintering ground and migration stop over for many migrating birds.

Rare Species (Includes Listed, Proposed, Candidate and Former Candidate Species)

Plants

Eleven plant species on Santa Rosa Island have been proposed for listing by the FWS as Endangered (Table 20, Fig. 10). Two species are currently presumed to have been extirpated from Santa Rosa Island. Last seen in the 1930's, repeated searches by botanists have failed to relocate *Berberis*, or *Helianthemum*. Two species have recently been discovered, or re-discovered, on Santa Rosa Island. *Arabis* was recently (March 1996) found in Lobos Canyon, but was previously thought to be extirpated on Santa Rosa. In 1996, Dieter Wilken discovered *Malacothrix indecora* on Santa Rosa Island, an island it had never been known to occur on. The species was found at two locations: the mouth of Cow Canyon and the mouth of Lobos Canyon, in Coastal Bluff scrub community.

The primary factors endangering the proposed species are soil loss, habitat destruction by mammals alien to the Channel Islands, direct predation by these same alien animals, competition with alien plant taxa, reduced genetic viability, depressed reproductive vigor, and the chance of stochastic (random) extinction resulting from small numbers of individuals and populations (Federal Register 60[142]:37993-38011).

Table 20. Santa Rosa Island plant taxa proposed for listing as Endangered by U.S. Fish and Wildlife Service.

Scientific Name	Common Name
<i>Arabis hoffmannii</i>	Hoffmann's rock-cress
<i>Arctostaphylos confertiflora</i>	Santa Rosa Island manzanita
<i>Berberis pinnata</i> ssp. <i>insularis</i> *	Island barberry
<i>Castilleja mollis</i>	Soft-leaved paintbrush
<i>Dudleya blochmaniae</i> ssp. <i>insularis</i>	Santa Rosa Island dudleya
<i>Dudleya greenei</i> forma <i>nova</i>	Munchkin dudleya
<i>Gilia tenuiflora</i> ssp. <i>hoffmannii</i>	Hoffmann's slender-flowered gilia
<i>Helianthemum greenei</i> *	Island rush-rose
<i>Heuchera maxima</i>	Island alumroot
<i>Malacothrix indecora</i>	Santa Cruz Island malacothrix
<i>Phacelia insularis</i> ssp. <i>insularis</i>	Island phacelia

*presumed extirpated from Santa Rosa Island

Several of the proposed species occur in shrublands. As discussed previously, shrubland communities have been significantly reduced in extent and replaced by annual grasslands. Current shrublands are heavily utilized by deer, further threatening the communities and the proposed plant species within them.

This section will describe the current distribution, historic distribution, condition and trend of the species on Santa Rosa Island, life history characteristics, the vegetation community(ies) in which the species occur, and cumulative impacts to the species. Cumulative impacts are those impacts which result from past and present actions which have, or continue to, impact the species.

Hoffman's rock-cress (*Arabis hoffmannii*)

Hoffman's rock-cress occurs on Santa Cruz and Santa Rosa Islands. It does not occur on the mainland. On Santa Cruz Island, it is known from three small populations that cover less than 1 acre total (USFWS 1995). On Santa Rosa Island, this species is only known from one small group of less than 10 individuals on a rock ledge in Lobos Canyon (McEachern 1996). Hoffman's rock-cress was formerly found on West Anacapa Island (USFWS 1995).

On Santa Rosa Island, historic and current habitat for Hoffman's rock-cress is Coastal Bluff Scrub and Coastal Sage Scrub. The species was reported from "the bank above Water Canyon" by Ralph Hoffman (S. Junak, pers. comm. 1993, USFWS 1995) in 1930 and in "sandy arroyo north of the ranch" [xxx was this reported by Hoffman also?]. Recent surveys have not located plants in these areas.

Figure 10. Recently recorded occurrences of plant species proposed for listing as endangered by U.S. Fish and Wildlife Service, Santa Rosa Island.

The population in Lobos Canyon had four flowering plants in March 1996 (McEachern 1996). They occurred in an area where they were free from browsing or trampling by ungulates. Any seeds produced would fall on ground covered with a dense stand of annual grass, and a cow trail passes close to the cliff wall at that location (McEachern 1996). McEachern (1996) concluded that seedlings would not be able to establish naturally in that area.

The primary impacts are soil loss, habitat degradation in the Coastal Bluff Scrub and Coastal Sage Scrub communities, restriction of range of these communities, restriction of range of Hoffman's rock-cress to small refugia protected from ungulate herbivory by steep terrain, and small population size.

Santa Rosa Island manzanita (*Arctostaphylos confertiflora*)

Santa Rosa Island manzanita occurs only on Santa Rosa Island. It does not occur on the mainland. Santa Rosa Island manzanita is known from steep terrain in eight canyons (McEachern et al. 1997). Searches of known locations and potential canyon habitats have found few plants (McEachern 1996). McEachern et al. (1997) note that past surveyors may have confused this species with the very similar *A. tomentosa* ssp. *insulicola* which occurs in similar habitats. Santa Rosa Island manzanita occurs

Santa Rosa Island manzanita was first collected in 1927 and was known from six canyons prior to recent surveys (McEachern et al. 1997).

The habitat for Santa Rosa Island Manzanita has been heavily impacted by deer browsing, trampling, and associated soil loss. McEachern (1996) was unable to find seedlings or young plants. Most recent twig growth had been browsed and the growth form of plants reflected heavy browsing. Few plants were found to have flowers or fruits (McEachern et al. 1997).

Wells (1989), following a tour of Santa Rosa Island, predicted "...the virtual extinction of several rare and endangered species during this period, including the bona fide Santa Rosa endemic, *Arctostaphylos confertiflora*." According to McEachern et al. (1997):

All plants were growing on steep canyon walls, along rim rock, or in chaparral mixed with decumbent forms of *Adenostoma fasciculatum* and *Quercus pacifica*, generally on eroded bedrock. More than 90% of the plants seen were accessible to ungulates, and were browsed at the growing tips and pruned into multi-branched or mushroomed forms. The areas under the canopies of the few large, erect *Arctostaphylos confertiflora* were heavily trampled by elk and deer, and the bedrock was eroding away around the roots.

The primary impacts on Santa Rosa Island Manzanita are related to soil loss, habitat degradation, restriction of range of suitable habitats, fragmentation of populations, small population size, and alteration in the fire regime in the chaparral, mixed woodland, Torrey pine woodland, and Bishop Pine woodlands on Santa Rosa Island.

Soft-leaved paintbrush (*Castilleja mollis*)

Soft-leaved paintbrush is known only from Santa Rosa Island. It does not occur on the mainland. It is known from two areas on Santa Rosa Island: Carrington/Lobos Pasture and Pocket Field (Jaw Gulch). Soft-leaved paintbrush does not appear to compete well with non-native alien grasses (Rindlaub 1994), resulting in the species being confined to less favorable sites with thin or eroding soils. It is found in Coastal Dunes, Lupine scrub, and Coastal Bluff scrub. The species is a partially-parasitic perennial herb, and is generally associated with species such as *Isocoma menziesii*, *Erigeron glaucus*, *Distichlis spicata*, *Atriplex californica*, and *Astragalus miguelensis* (McEachern et al. 1997).

Historically, soft-leaved paintbrush occurred on San Miguel Island. In 1938, this species was collected from the Point Bennett area (Heckard and Ingram 1991). Recent searches have not located this species on San Miguel. (USFWS 1995). On Santa Rosa Island, McEachern et al. (1997) report they were able to relocate two of the five historically known populations of *C. mollis*, although all suitable habitat in historic locations was searched.

Researchers (Ingram 1990, Rindlaub 1994, McEachern 1996, and McEachern et al. 1997) have noted threats to soft-leaved paintbrush, and/or its host plant, from pigs, cattle, deer, elk, and alien grasses. D. Richards (pers. comm. 1993) observed deer bedding in the Jaw Gulch population during the fall of 1993. S. Chaney (pers. comm. 1995) observed disturbance by deer and elk in both the Jaw Gulch and Carrington Point populations. McEachern et al. (1997) noted deer trailing in the upper one-third of the Carrington Point population and deer scat throughout the population. In the Jaw Gulch population droppings of cow, deer, and elk were present. Trails of cow and elk were apparent. They observed cows, deer, and elk traveling through the *C. mollis* population "both on established trails and off trails".

Surveys of browsed and broken stems of the soft-leaved paintbrush found 6% - 71% to be damaged, with an overall average of 25% (Rindlaub 1994; McEachern 1996; McEachern et al. 1997). McEachern et al. (1997) found that hoof scraping by deer and elk in the fall caused a significant number of broken stems for *Castilleja mollis*.

The primary impacts on soft-leaved paintbrush are related to habitat degradation in the Coastal Dune, Lupine scrub, and Coastal Bluff scrub communities on Santa Rosa Island, restricted range of native habitat, and fragmentation of populations.

Santa Rosa Island dudleya (*Dudleya blochmaniae* ssp. *insularis*)

Santa Rosa Island dudleya occurs only on Santa Rosa Island. The worldwide range consists of one limestone terrace outcrop, less than two acres in size, near the east end of Santa Rosa Island. The associated vegetation community is Coastal Bluff Scrub. The outcrop is largely bare of vegetation except for scattered individuals and clusters of dudleya, annual grasses, and *Lasthenia californica* (McEachern 1996). This species has never been reported from any location other than the current single location.

The number of individuals is estimated to be 2000 (USFWS 1995). There is no historical information on population size.

Non-native iceplant occurs in the habitat of the Santa Rosa Island dudleya. The iceplant probably decreases the amount of suitable habitat available to Santa Rosa Island dudleya.

Munchkin dudleya (*Dudleya greenei* forma nova)

Munchkin dudleya occurs only on three sandstone outcrops at the east end of Santa Rosa Island. Individual plants occur only on the bare rock surfaces and do not occur in the sparse grassy margins of the outcrop, nor in the surrounding annual grassland (McEachern 1996). A cattle-proof barbed wire fence was constructed around the outcrops in summer 1994.

Census counts by McEachern (1996) indicate there are about 1000 individuals of munchkin dudleya at East Point. As a result of 1994 censusing and demography work in 1995 and 1996, McEachern concluded that sufficient pollination and seed set are occurring to produce at least some seedlings, but that seedling mortality can be extremely high in the first few months of the growing season.

Because the taxon is restricted to one population, the species is vulnerable to stochastic (random) extinction by such events as storms, drought or fire.

Hoffmann's slender-flowered gilia (*Gilia tenuiflora* ssp. *hoffmannii*)

Hoffman's slender-flowered gilia occurs only on Santa Rosa Island. It does not occur on the mainland. On Santa Rosa Island, the gilia occurs in three locations: Carrington Point, Skunk Point, and East Point. Rindlaub (1994, 1995, and 1996) reported these locations to support 85, 1000 to 2000, and several thousand plants, respectively.

Historically, the species was collected from an unknown location between the Ranch and Carrington Point in 1941 but recent surveys have failed to relocate the plant at this location (USFWS 1995).

The gilia populations occur in, or are surrounded by, Dune and Coastal Bluff Scrub habitat that has been greatly altered since the introduction of ungulates. Rindlaub (1994) noted evidence of grazing of gilia. Additionally, a vehicle road bisects the population of gilia near East Point. Approximately 2/3 of the population of Hoffman's slender-flowered gilia near East Point was fenced to exclude cattle in 1995.

The primary impact to this species is the degradation of the Dune and Coastal Bluff Scrub communities. The gilia populations are surrounded by extensive non-native annual grasslands.

Island alumroot (*Heuchera maxima*)

McEachern et al. (1997) found *H. maxima* in three of the four historical canyon locations from which it was previously known. In all cases, the populations occur on "north-facing headwalls and nearly vertical cliff faces in areas out of reach of ungulates" (McEachern et al. 1997). The plant occurs in moist, shady, north-facing canyon walls on Santa Rosa, in Mixed woodland, Coastal Bluff Scrub, and Chaparral communities.

Island alumroot was known from four locations on Santa Rosa Island (Cherry, Lobos, Ranch, and Windmill Canyons) (USFWS 1995, McEachern et al. 1997).

Island alumroot appears to be doing well in the locations where it has persisted; i.e. areas that are inaccessible to ungulates. The primary impacts are degradation of woody vegetation communities and shrinking of the species range to steep terrain.

Santa Cruz Island malacothrix (*Malacothrix indecora*)

Until recently, Santa Cruz Island malacothrix was known to survive at only one location, Black Point on the west end of Santa Cruz Island. In 1996, Dieter Wilken discovered *M. indecora* on Santa Rosa Island, an island it had never been known to occur on. The species was found at two locations: the mouth of Cow Canyon and the mouth of Lobos Canyon, in Coastal Bluff scrub community.

The distribution of *M. indecora* has never been known to be widespread. It has been collected from the northeast shore of San Miguel Island, from Prince Island, from Twin Harbor on Santa Cruz Island and from Black Point on Santa Cruz Island (USFWS 1995).

The primary impact to malacothrix is habitat degradation in the coastal bluff community.

Island phacelia (*Phacelia insularis* ssp. *insularis*)

Island phacelia is an annual herb found on Santa Rosa and San Miguel Islands in Dune, Lupine Scrub, and Coastal Bluff Scrub communities. On Santa Rosa Island this species occurs in Carrington Pasture. Munz (1932) first reported this species from "sand dunes at northeastern part [Skunk Point area] of Santa Rosa Island." Phacelia has not been found at this location in recent surveys. Clifton Smith collected *P. insularis* ssp. *insularis* from Carrington Point in 1973.

Island phacelia occurs in very low numbers. There is no trend information except for the apparent loss of the species from the Skunk Point area of Santa Rosa Island.

Non-native annual grasses have degraded the native habitats of the island phacelia. Suitable conditions for germination and growth of the species require openings in vegetation. This situation occurs naturally in scrub communities but does not occur in annual grasslands.

Other Plant Species of Concern

In addition to the 10 proposed species, 74 Park "Species of Concern" occur on Santa Rosa Island (Coonan et al. 1996) (Appendix B). These are native plant species that regional botanists who are familiar with island and adjacent mainland flora believe to be declining in abundance in the Park. These species also occur predominantly in shrubland communities.

The majority of Proposed species and Species of Concern occur in upland habitats. *Heuchera maxima* is the only Proposed species to occur in riparian areas (in addition to its shrubland and woodland locations). Seven Species of Concern are known to occur in riparian or wetland habitats.

Animals

The federally listed peregrine falcon (*Falco peregrinus*) bred historically on many of the northern Channel Islands but disappeared in the early part of this century due to the adverse effects of pesticides, hunting and human disturbance. Thanks to an aggressive reintroduction program, peregrine falcons have recently recolonized many of the northern Channel Islands, including Santa Rosa. Bald eagles also historically bred on Santa Rosa, but no longer breed on any of the northern Channel Islands.

The federally listed western snowy plover (*Charadrius alexandrius nivosus*) breeds primarily on coastal beaches from southern Washington to Baja California. Eight areas, including Santa Rosa Island, support 78% of the California coastal breeding population (Page et al. 1991). On Santa Rosa, plovers breed on many beaches on the northeast, southwest, and northwest coasts of the island. A total of 121 breeding adults bred on Santa Rosa in 1993, or 8.7% of the coastal California breeding population. The Skunk Point and East Point beaches are particularly important on Santa Rosa; between 50 and 75 plovers nest there annually. Nest sites typically occur in flat, open areas with sandy or saline substrates; vegetation and driftwood are usually sparse or absent (Wilson 1980, Stenzel et al. cf. Federal Register 1993). Nesting success, at least on Santa Rosa Island, is low. In a two-year study at Skunk Point, percentage of nests that failed was 68% in 1992 and 89% in 1993 (Keimel 1992, Stein 1993). Wind and predation were identified as major factors causing nest failure. Trampling by livestock accounted for 4.3% of nest failures in 1992 and 6% of nest failures in 1993.

In 1995, FWS issued a biological opinion evaluating the effects of Park activities on Western Snowy Plover and Brown Pelicans at Channel Islands National Park. In order to minimize incidental take of plovers from NPS-approved activities, FWS identified the following reasonable and prudent measures to be taken by NPS:

- establishment of a permanent closure for the Skunk Point area for protection of nesting plovers;
- limitations on and monitoring of beach camping, beach use, and associated activities on Santa Rosa and San Miguel Islands for protection of nesting plovers.

To gain protection of nesting snowy plovers on Skunk Point, in 1995 NPS and Vail & Vickers constructed an electric fence in Old Ranch Pasture to exclude all cattle and horses from the Skunk Point closure during the plover breeding season. The fence has been breached by cattle several times since installation.

CULTURAL RESOURCES

Historical and Archaeological Resources

Extensive and numerous archeological sites characterize Santa Rosa Island. Early occupation on the island commenced approximately 10,000 years ago, near the end of the Pleistocene; sites dating 8,000 years ago are fairly common on the island. An estimated 2,000-3,000 sites contain a record of the development and adaptation of Chumash culture from this period until the group's departure from Santa Rosa Island in 1815. In contrast to comparable mainland sites, archeological localities on Santa Rosa have been relatively undisturbed and retain great research potential. Phil Orr's find of "Arlington Man," a partial human skeleton is at least 10,000 years

old, and may be as much as 1,000 years older. Even the most recent of these dates places this individual as one of the oldest ever found in North America. Santa Rosa Island is eminently suitable for nomination to the National Register of Historic Places as an archeological district.

While sites have been degraded by livestock grazing and rooting and foraging by pigs, the lack of burrowing animals on the island has resulted in excellent preservation of archeological stratigraphy. Numerous small caves and rock shelters containing perishable materials retain unique data critical for understanding cultural processes and past environments. There is high potential for submerged prehistoric sites offshore from the island which could provide unique insights into the archeological record.

The Santa Barbara Museum of Natural History recorded 182 archeological sites on Santa Rosa Island from 1945 to 1963. A Park Service archeological survey, which is still in progress, has covered approximately 30% of the island, recording 580 sites, suggesting that the total site inventory for the island may approach 2000 sites. Recorded sites range in age from early period locales nearly 9000 years old to historic camps dating from World War II, and include Chinese abalone camps, historic shipwrecks, military construction, and oil field camps, as well as the more frequent prehistoric sites. Items recorded range in size from single, isolated artifacts to one which is 480,000 square meters in extent. This survey has given coastal areas high priority in order to assess losses of archeological material resulting from coastal wave action. The survey data will be used to prepare a nomination to the National Register. Like the other park islands, all of Santa Rosa Island will probably be nominated as an archeological district.

The present ranch complex preserves a tradition of island ranching that began during the 1840's. Several of the structures, including the main ranch house and the two red barns, date from the early 1870's, while other structures are much more recent. Fourteen of the structures at Becher's Bay are listed on the current List of Classified Structures. Houses and barns built with square-cut nails adjacent to satellite TV dishes show the innovation and conservatism that characterize the present cattle operation on the island. Other historical locations related to Spanish exploration, Aleut sea otter hunting, Chinese abalone fishing, and World War II military activities embellish the historical tradition of the island. The beaches and offshore waters of Santa Rosa contain at least six historic shipwrecks which illustrate the development of fishing and marine mammal hunting and worldwide commercial trade as southern California integrated into the global economy.

The ranch buildings at Bechers Bay, together with their surrounding fields and pastures, and the China Camp cabin are in the process of nomination to the National Register.

Cultural Landscapes

The immediate environs of the Bechers Bay Ranch constitute a historic landscape preservation area which will retain the rural aspects of isolated island ranch life and provide a suitable setting for the historic ranch complex. The other landscapes and viewsheds of the island, if maintained in their present state, represent the current ranching practices; if returned to more natural conditions, these landscapes will represent the environment within which the Chumash cultural sequence developed.

A Cultural landscape Study is scheduled in the park's current Resources Management Plan. This study will refine the current understanding of the cultural landscapes of the island.

Ethnography

Descendants of the Chumash are greatly concerned with the treatment of their historical remains, both human burials and archeological sites. An assessment of ethnic concerns is needed to provide information to guide management decisions in this sensitive area. The Chumash are particularly concerned that burials and associated artifacts remain undisturbed. Reburial of human remains taken from the islands is a current issue of concern. On Santa Rosa Island, as on other park islands, eroding burials in areas accessible to the public have been recovered in place. Descendants of the Chumash island lineages and other appropriate groups will be consulted on proposed actions that affect prehistoric sites.

Paleontological Resources

The best studied aspect of Santa Rosa Islands paleontology is the numerous fossil bones of the pygmy mammoth, *Mammuthus exilis*, a unique species found on the northern Channel Islands, most commonly on Santa Rosa Island. This species descended from full sized ancestors who swam the Santa Barbara Channel to the islands during the Pleistocene and became isolated on the islands. Dying off at about the end of the Pleistocene (12,000 years ago), these animals are represented by fossils which are often exposed in sands, silts, and gravels of Pleistocene age anywhere on the island. Most specimens have been found in the sediments comprising the coastal terraces of the island. Due to the numerous questions about many aspects of this species evolution and development, any fossil may potentially be of crucial importance in answering important research questions. Other fossil localities containing smaller terrestrial species of Pleistocene age and invertebrate fossils embedded within the Miocene strata of the island remain unstudied. Today, bones are often exposed by erosion, and unless collected properly and promptly, they may be scattered and lost due to weather and the actions of large mammals on the island.

SOCIOECONOMIC RESOURCES

Regional Demographic Profile

The population of the Los Angeles Basin was determined to be 13,887,100 in 1988, with more than half of that total residing in the Los Angeles/Long Beach area. The population of Ventura County in 1993 was 693,900 (BEA, 1995). In recent history this has been one of the fastest growing areas of the nation. The Los Angeles Basin is expected to experience a 21.4% increase in growth between the years 1988 and 2000. Population density figures indicate that the region is very heavily populated, with Orange County registering the highest figure, over 2,000 people per square mile. The percentage of the population classified as urban is extremely high. Education, age, and income statistics demonstrate that the regional population is slightly more educated, slightly younger, and generally more affluent than the comparable national standards. In 1993, Ventura County had a per capita personal income of \$22,003, which ranked 56th in the United States and was 106% of the national average. (BEA, 1995). Santa Barbara County had a per

capita personal income of \$24, 013, which ranked 28th in the United States and was 115% of the national average.

Regional Economic Environment

On a Regional scale, the economy of Southern California is generally well developed and highly structured, and it includes economic sectors representing energy, tourism, agriculture, military services, and manufacturing. Economic activities occurring in and around the Santa Barbara channel and relevant to Channel Islands National Park are the recreation, oil and gas, fisheries, and ranching industries. The latter is especially relevant due to the current commercial ranching operation on Santa Rosa Island. In 1994, 597,622 acres of privately owned rangeland were located within Santa Barbara County with a total value of \$4,350,979. These rangelands produced 54,099 head sold in 1994 with a total value of \$26,511,318 (W. Jensen, personal communication).

In addition, the Southern California Bight has a long history as a commercially important region for fishery activities (both commercial and sport) and for recreational resources. Recreational resources are extensive in the region and are a significant basis of economic activity. The coastal environment is a national attraction with a large number of opportunities for water-related recreation. Recreational use generates millions of dollars of revenue for the regional economy.

More specifically, Channel Islands National Park hosts a variety of different types of fishery activities including commercial operations and sport fishing from private and party boats, both from the surface and by diving. Additionally, the relatively undisturbed underwater environment of the islands is a significant attraction for an increasing number of skin and scuba divers who come to see the underwater resources rather than to fish.

Visitor Use

The Park's enabling legislation (Public Law 96-199) directed that visitor use within Channel Islands National Park be limited in order to minimize adverse impacts to the Park's fragile and sensitive resources. Although potential opportunities for recreation on Santa Rosa are significant, access is also restricted to avoid conflicts with the current ranching operation. The expense of transportation to the island also limits the number of visitors.

Numerous private and commercial fishing boats utilize the anchorages around Santa Rosa Island, but these vessels have not been systematically counted. Few private boaters come ashore and those who do primarily spend a few hours on the beaches, rarely venturing farther inland. During the main visitor use season (May through early September) island personnel estimate approximately 20 private boaters come ashore and contact NPS employees each week. The campground in Water Canyon holds up to 30 campers per night. It is popular, but not heavily used, probably because access to the island is not simple or inexpensive.

The Island Packers Company (IPCO) is the concessionaire providing boat transportation to Park islands. The company transports approximately 200 visitors per month during the summer and about 50 people per month during the remainder of the year. Channel Islands Aviation provides commercial air service to the island, primarily on weekends. Transportation by air is estimated at 30 visitors per week in the summer and perhaps 30 per month the rest of the year. Estimated annual visitation to Santa Rosa is thus 2,050.

Grazing/hunting Permittee

Santa Rosa Island has a history of ranching on the island which continues through today. The National Park Service purchased Santa Rosa Island for \$28.5 million from Vail & Vickers in 1986. Currently, Vail & Vickers operate a stocker system for cattle and a hunting operation for elk and deer through a Special Use Permit (SUP) issued by the National Park Service. The SUP is renewable every five years, and the ranching and hunt operations are scheduled to terminate on December 29, 2011. The permittee's operation is for-profit and also generates revenue to the National Park Service through grazing fees. The current grazing fee for the 1993-1997 supplemental use permit is set at \$1.00 per head month (one month of use for one adult cow or horse). The purpose of setting these fees is to charge a fee for domestic livestock grazing and National Park Service land that represents fair market value of the use of the land and which is fair and equitable to the Federal Government and the users. The permittees maintain approximately 42,000 Animal Unit Months (AUMs) annually, or between 4500 and 6500 head of cattle.

Under the Vail & Vickers stocker operation, calves are brought to the island, usually in the fall, and fattened on the island for approximately 18 months, then taken off the island to a feed lot (Bartolome and Clawson 1992). Using the stocker system gives the ranch important flexibility to adjust numbers of animals quickly if drought occurs. For the most part the ranch uses a continuous grazing system, where cattle spend an entire year (or more) in one pasture. There is little pasture rotation of cattle.

The island is broken up into ten pastures. Only five of these pastures (comprising approximately 50,000 acres) are used to graze cattle with the continuous grazing system. The other five pastures are holding pastures. Because the pastures are so large (up to 24,000 acres) and water sources so few, the island experiences very patchy use by the cattle. In these types of situations, forage resources are underutilized in upland areas, while in areas near streams, the forage is more intensively utilized (Valentine 1990). The ranch has created few water developments, and so the cattle obtain water primarily from streams

The 1992 SUP directed that "A range management plan (RMP) will be developed by the Permittee and the NPS for the purposes of continuing the enhancement of the rangelands and to accommodate the grazing stock and revegetation of the grasslands". A range management plan for Santa Rosa Island was subsequently developed (Bartolome and Clawson 1992). The range management plan estimated grazing capacities for Santa Rosa Island using the "scorecard" method, which is based on estimated forage production and recommended residual dry matter under proper grazing use, and recommended the following:

- Continue livestock grazing operation and fee hunting.

- Implement a program of range monitoring in 1992 to measure residual dry matter (RDM) and guide stocking rates.
- Fence snowy plover nesting areas and marsh in Old Ranch Pasture.
- Take immediate steps to protect the existing reproduction of closed-cone pines on Black Mountain.
- Construct a fence to exclude livestock from a portion of Lobos Canyon.
- Implement a program to monitor areas of special concern to the NPS, including canyon/riparian areas, chaparral, closed-cone pine, grasslands, and habitats for candidate plants.
- Develop a time table and program for monitoring browse utilization and managing deer numbers.
- Obtain more detailed information on distribution of native plants, soils, and restoration techniques to work towards the goal of reduction of alien species and enhancement of natives.

The 1992 SUP also called for preparation of a deer management plan.

The following elements of the range management plan have been implemented thus far:

- A fence to protect snowy plover nesting areas on Skunk Point was built in 1995. A fence to protect the lower portion of Lobos Canyon was built in 1993. A limited number of wire exclosures were built around Bishop pine seedlings on Black Mountain in 1994.
- Spring and fall RDM monitoring was initiated in 1992 (see description of methods in Appendix B, and in Bartolome and Clawson 1992). Thirty-four RDM sites, located at least 1/4 mile from water sources and on slopes less than 25%, are monitored on the island. The park does not monitor forage in riparian areas, areas less than 1/4 mile from water sources or on steep slopes.

Sixteen of the RDM sites have at least 30% frequency of perennial grasses. These perennial grass sites tend to produce more forage than annual grass sites, especially during the summer drought. These sites also require less intensive utilization than annual grasses.

Although results from RDM monitoring can be used to adjust stocking rates, rates thus far have been set by customary practice, e.g., the permittee adjusts stocking rate according to past experience and current needs. Results from RDM monitoring may be most valuable for adjusting stocking rates between average precipitation years and drought years.

The permittee incurs annual expenses to maintain their operations on Santa Rosa Island, including payment to the National Park Service of \$1.00 per AUM annually. The permittee also earns revenue from cattle sales and the elk and deer hunting operation on the island. In general, stocker operations generate larger returns than cow-calf or cow-yearling operations and generally earn a profit in the long run. However, shrinkage and transportation costs of procuring stocker cattle from distant locations on the mainland to the island can have a major impact on returns, and the operator must assume the market price risk between purchasing and resale. As a result, returns can be quite variable among ranches using purchased stocker systems, depending on location with respect to stocker supplies, markets and the operator's ability to buy and sell. Thus,

economic considerations will be treated in a general sense throughout this document, as opposed to the use of specific numerical data.

NPS Operations

The National Park Service spends an annual average of \$350,000 to maintain basic operations for Santa Rosa Island. These costs are paid from appropriated funds and include items such as NPS salaries, transportation costs, and on-island support of NPS programs. Expenses for these activities are necessary for park operations and are unrelated to the continuation of the permittee operations on the island. However, NPS generates revenue from the SUP fees, which have totaled more than \$475,000 since 1986.

Wilderness Values

A National Wilderness System was established in 1964 with the passage of the Wilderness Act (P.L. 88-577). The Act provides that wilderness shall be administered for the use and enjoyment of the American people in such manner as will leave them unimpaired for future use and enjoyment as wilderness. The Act defined "wilderness" as federal land "...where the earth and its community of life are untrammelled by man, where man himself is a visitor who does not remain...(and) which is protected and managed to preserve its natural conditions..."

The Park's General Management Plan (NPS 1985) states that formal wilderness studies and recommendations for all the Park islands will be deferred until predominantly natural conditions have been restored on the islands, and no further intensive resource management efforts are required. The GMP stated that, currently, Santa Rosa would not meet wilderness criteria due to the presence of domestic stock and exotic grazing animals. However, the GMP also stated that natural areas in the Park would be managed to the extent feasible as wilderness so as not to preclude later qualification for such designation.

ENVIRONMENTAL CONSEQUENCES

In this section, each alternative is analyzed for effects on natural resources (soils, water quality and riparian areas, vegetation, wildlife, rare species and their habitats), cultural resources (archeological and historical resources, cultural landscapes, and ethnography), and the socioeconomic environment (visitor use, effects on the grazing/hunting permittee, effects on NPS operations, wilderness). Types of effects analyzed include direct and indirect, and short-term and long-term.

Cumulative impacts are those impacts on the environment which result from the incremental impact of the action when added to other past, present, and foreseeable future actions, regardless of what agency or other person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. Cumulative impacts are discussed at the end of the respective sub-section for each alternative. Unavoidable adverse impacts of each alternative are discussed at the very end of the Environmental Consequences section, as well as the relationship of short-term uses and long-term productivity, and irreversible and irretrievable commitments of resources.

Both *beneficial* (positive) and *adverse* (negative) effects are discussed. Where possible, the severity of effects on resources is quantified as *negligible*, *slight*, *moderate* or *heavy (substantial)*. Additionally, impacts are identified as *significant* depending upon both the context and the intensity (severity) of the effect.

ALTERNATIVE A: NO ACTION

Alternative A, No Action, is the continuance of the status quo. No major resource developments or changes would take place. Under this alternative, NPS would take no action to improve water quality or riparian values. NPS would consult with U.S. Fish and Wildlife Service regarding effects on listed and candidate species, and would implement any mitigation actions identified in the consultation process. Livestock and game species would be managed as they currently are. Cattle would continue to graze under a continuous use system. The weed management program would be increased as funding allows, in order to address weed management problems on Santa Rosa Island. All grazing and hunt operations would cease by 2011.

Natural Resources

Soils

Under this alternative, continued grazing in all pastures will maintain the current heavy effects on soils and biotic crusts. These impacts include: continued trampling of soils, resulting in decreased soil stability, decreased water availability for vascular plants, and increased soil loss; decreased nutrient content of plants; increased vegetation loss; and decreased soil temperatures, which can affect success of vascular plant establishment, nutrient content of plants and activity levels of soil biota. These effects would occur in areas where cattle concentrate, such as around water sources, in areas where ungulates trail, and in areas where ranch vehicles regularly travel

off-road during ranch and hunt operations. These impacts will be eliminated when grazing ends in 2011, and stabilization and recovery of soils should subsequently occur.

There would be no effects to soils from pesticide use proposed under this alternative. Pesticide use would probably remain at or slightly above existing levels (Table 17). The Park uses Garlon 3A (active ingredient triclopyr) and Roundup (active ingredient glyphosate). In soil and in aquatic environments, triclopyr, a selective, systemic herbicide, rapidly converts to an acid, which in turn is neutralized to a salt (EXTOXNET 1993). Triclopyr is rapidly degraded by soil microorganisms. The half-life in soils is from 30 to 90 days, with an average of about 46 days. Triclopyr is readily translocated throughout a plant after being taken up by either roots or the foliage. The estimated half-life in aboveground drying foliage is two to three months. Breakdown by sunlight is the major means of triclopyr degradation in water; the half-life is 10 hours at 25° C.

Glyphosate, a broad-spectrum, non-selective systemic herbicide, is so highly adsorbed on most soils that little is expected to leach from the application area (EXTOXNET 1994). Microbes are responsible for breakdown of the product, and the half-life in soil ranges from 1-174 days. Photodecomposition plays only a minor role in environmental breakdown. Glyphosate may be extensively metabolized by some plants while remaining intact in others. Once in the plant tissue, the chemical is translocated throughout the plant, including to the roots.

The spot treatment method of application minimizes the amount of herbicide that contacts soil.

Water Quality and Riparian Areas

Under the No Action alternative, cattle would continue to have unrestricted access to the vast majority of streams and riparian areas, and there will continue to be heavy effects on water quality and riparian areas. With the exception of the final two-mile length of Lobo Canyon and a portion of Windmill Creek within Horse Pasture, no stream would receive any protection from the effects of continuous cattle grazing. Most stream reaches would continue to lack any shrubby or woody riparian plants. Existing trees and shrubs would most likely not be able to successfully reproduce. Many of the riparian trees and shrubs are very old and eventually will die. Under the No Action alternative some populations of old riparian plants may perish before they can reproduce, causing the extirpation of that population. Particularly at risk are the three cottonwood trees in Lobo Canyon. Although cattle are now excluded from the stream reaches containing the cottonwood trees, deer are still present and devour seedlings of many riparian tree and shrub species. At this point the cottonwood trees are no longer flowering. Without active restoration efforts, the island would most likely lose this species altogether. Willows are also at risk, but the risk would be considerably less due to the higher number and wider distribution of plants on the island.

Without adequate vegetation cover, stream banks would likely remain unstable. Accelerated rates of erosion (currently nine times pre-European levels) would continue. Streams would continue to remain non-functional in their role to dissipate flood energies and trap sediments. Suspended sediment levels would continue to dramatically peak during storm events, indicating the continued loss of limited soil resources. Once gone, these resources can not be regained. Streams may continue to widen and the water column may become more shallow.

Water quality would remain poor. Water temperatures would continue to be unnaturally high, especially during warm sunny days. *Cladophora* algae would likely continue to seasonally choke the streams, flooding the streams with dissolved Oxygen during the day, when they photosynthesize, and removing dissolved Oxygen at night, when they respire. There would be insufficient dissolved Oxygen to support aquatic animal populations. Nutrient inputs into the stream would continue to be high and promote heavy growth of algae within the streams. Coliform levels would likely remain high, especially during the summer months when cattle tend to congregate near streams. Coliform levels would likely continue to exceed standards set for the water contact (REC-1) beneficial use.

Cattle impacts to the marsh and lagoon in Old Ranch Pasture would continue. Cattle would continue to trample and graze wetland vegetation. Unnaturally high rates of sedimentation would continue. Marsh vegetation would continue the present trend toward upland vegetation types, as the marsh continues to dry out.

There would be no effects on water quality from herbicide application under this alternative. Herbicide would not be applied near water, and therefore would be little chance of leaching into groundwater or surface waters. Glyphosate binds tightly to soil particles and would decompose *in situ* within 1-6 months following treatment. Although triclopyr is much more mobile in the soil (it does not adsorb to soil particles), it breaks down more rapidly in soil (approximately 45 days) and very rapidly in water (10 hours). It is practically non-toxic to fish and aquatic invertebrates.

Vegetation

Maintaining the current ranch and Park operations would result in the continuation of current effects on vegetation communities. Shrub communities will continue to be heavily impacted by grazing. Chaparral and coastal sage scrub communities will be limited in range by grazing and browsing. Chaparral will continue to be heavily browsed by deer. Annual grassland will continue to dominate the island. Cattle impacts to vernal pools in Pocket Field and Old Ranch pastures will continue.

Implementation of no action will have moderate effects on weed management. Current weed trends are likely to continue. Thistle populations are likely to continue to increase, fennel is likely to continue to be controlled through grazing. If funding becomes available, then incremental increases in the weed management program will provide opportunities to prevent the spread of weeds to new locations as well as to eradicate current populations. The weed management program may reduce introduction of new weeds to the island through educational efforts directed toward Park staff and visitors.

Under the No Action alternative, forage utilization would continue to be patchy. Some areas, particularly in the uplands, would continue to be underutilized, while other areas, particularly in the riparian zones, would continue to be overutilized. Monitoring of forage would continue to use the rank yield method, and the minimum level for residual dry matter (RDM) would remain at 400 lb./ac. This is the bare minimum recommended for annual grasslands. Grazing utilization leaving only this amount would likely have moderately adverse impacts on perennial components of the island's grasslands, and would contribute to upland erosion.

Wildlife

Under the No Action alternative, there will continue to be moderate effects on wildlife. Wildlife populations would probably continue to exist at or near their current levels. However, species currently existing at low population levels may continue to be at risk of extirpation.

The Channel Islands spotted skunk and Santa Cruz gopher snake may exist at relatively low population levels on Santa Rosa Island. Under the No Action alternative, habitat for skunks and gopher snakes would not be improved until grazing ends in 2011.

Effects on deer mouse populations are unknown, since little is known about deer mice populations on Santa Rosa Island.

There would be no effects to wildlife from pesticide use proposed under this alternative. Method of application (spot treatment of individual plants) minimizes the amount of herbicide used and that wildlife might contact or ingest. Triclopyr has low chronic toxicity to mammals and is not expected to concentrate to any significant degree in animal tissue (EXTOXNET 1993). Triclopyr is slightly toxic to water fowl and practically non-toxic to fish and aquatic invertebrates. Glyphosate is only slightly toxic to wild birds, and is practically nontoxic to fish (EXTOXNET 1994). There is very low potential for the chemical to accumulate in the tissues of aquatic invertebrates or other aquatic organisms. In mammals, glyphosate is poorly absorbed from the digestive tract and is largely excreted unchanged; it has no significant potential to accumulate in animal tissue.

Rare Species, and Their Habitats

Under this alternative, there would continue to be heavy effects on rare plant populations and their. Direct effects would include grazing, browsing, and trampling by cattle, deer, and elk. Rare species would also continue to be subject to the indirect effects of soil erosion, weeds and other alien plant competition, and pollinator loss.

Observed direct impacts on proposed species in Old Ranch Pasture are trampling and uprooting of *Dudleya blochmaniae* ssp. *insularis* and *D. sp. nov.*, and grazing of *Gilia tenuiflora* ssp. *hoffmannii* (S. Chaney, pers. comm. 1996, K. McEachern, 1996). Habitat for the *gilia* is threatened by cattle trampling and consumption of ambrosia (C. Sellgren, 1996), a plant essential for the stabilization of the dunes where *Gilia* grows. *Heuchera* currently occurs only on slopes inaccessible to cattle, despite widespread suitable habitat. *Phacelia* no longer occurs in Old Ranch Pasture, which is much more heavily grazed than Carrington Pasture, where that plant is currently growing. Both *dudleya* species have been subject to crushing by vehicles. Unless mitigated, these effects on proposed species in Old Ranch Pasture are likely to continue under this alternative.

Existing cattle enclosures would be maintained. These include fenced populations of Hoffmann's *gilia* and *munchkin dudleya* in Old Ranch Pasture (approximately 10 acres), the Soledad island oak grove (approximately 2 acres), the Lobo Canyon enclosure (approximately 100 acres), and the plover enclosure on Skunk Point. The enclosures are built to exclude cattle, but do not exclude deer or elk.

Proposed plant species that are believed to be affected by deer browsing are *Berberis pinnata* ssp. *insularis*, *Arctostaphylos confertiflora*, *Arabis hoffmanii*, *Helianthemum greenei*, and *Castilleja mollis*. *Berberis* and *Helianthemum* are no longer found on the island. They were last seen during the early 1930's, the same time at which deer were becoming established on the island. It is possible that the extirpation of these rare species is the direct result of habitat alteration or predation by mule deer. Predation (S. Chaney, pers. comm. 1993) and trampling (K. McEachern, pers. comm. 1996) of *Castilleja mollis* by deer has been observed at Carrington Point. Manzanita (*A. confertiflora*) has undergone severe form alteration due to heavy browsing by deer. Clark et al. (1990) reported that most individuals are either strongly hedged or arborescent, and that seedling establishment is rare to nonexistent. It is this failure to successfully reproduce that is the severest threat to the continued existence of Santa Rosa Island manzanita, as well as to all the other proposed species.

Hedging, mushrooming, and lack of reproduction of shrubs and trees is common throughout the shrub and woodland communities on Santa Rosa Island. In addition to impacts seen on manzanita, similar damage has been observed on at least 15 Park Species of Concern. These include *Adenostoma fasciculatum*, *Arctostaphylos tomentosa insulicola*, *Ceanothus megacarpus insularis*, *Comarostaphylos diversifolia planifolia*, *Prunus ilicifolia*, *Rhamnus pirifolia*, *Pinus remorata*, *Lyonothamnus floribundus asplenifolius*, *Quercus tomentella*, *Q. agrifolia*, *Q. dumosa*, *Rubus ursinus*, *Sambucus mexicanus*, *Populus trichocarpa*, *Rosa californica*, and *Salix lasiolepis* (Clark et al. 1990, McEachern, 1996).

Herbicide use proposed under this alternative would have no effect on listed or proposed species, except in the sense that eradication of alien species eliminates potential competitor for rare and other native plant species. Individual plants would not be affected; the spot method of herbicide application minimizes effects on non-target species. Herbicides would not be applied near populations or individuals of proposed or listed species.

Implementation of this alternative will have no effect on peregrine falcons nesting on Santa Rosa Island.

Current beneficial and adverse effects on Western Snowy Plover would continue, under this alternative. The exclusion of livestock from plover nesting habitat on Skunk Point would continue to have substantial beneficial effects on plovers. Cattle grazing would continue to have unknown, but probably negligible, effects on nesting snowy plovers on other beaches of the island. Occasional deaths of cattle may continue to have slight to moderate adverse effects on plovers, since carcasses attract and support artificially high populations of Common Ravens (*Corvus corax*). Ravens which were responsible for 1/2 to 2/3 of depredated plover nests on Skunk Point (Keimel 1992, Stein 1993).

Cultural Resources

Archeological Resources

Under the No Action alternative, there will continue to be moderate effects on archeological sites. Cattle will continue to graze on most archeological sites, with attendant trampling damage.

In addition, erosion will continue to disrupt archeological materials at or near current moderately severe levels of impact.

Historical Resources

This alternative would have no effect upon historic structures on the island or the surrounding historic landscape preservation area.

Cultural Landscapes

This alternative would have no effect upon the existing cultural landscape.

Ethnography

Under this alternative, there would continue to be moderate effects on ethnographic materials. Burials will continue to erode at their present rate. Elements introduced after European contact will be present on the island.

Socioeconomic Environment

Regional Economic Environment

Implementation of this alternative would have no effect on the existing regional economic environment. The ranch would generate the same revenue as it currently does, the regional recreational business would stay the same, as would the NPS operation.

Visitor Use

Implementation of the No Action alternative would continue to have slight effects on the visitor experience. Visitor activities currently stress low-impact, low-volume activities. This approach would not change under the no action alternative. In addition, visitor use facilities currently available on Santa Rosa Island would not change and the nature of the visitors' experiences and activities are also not expected to change. However, with no measures directed at erosion mitigation and weed eradication, aesthetics of the island may decline over time, negatively impacting the visitor's experience.

Grazing/hunting Permittee

Implementation of the No Action alternative would have no effect on ranch operations, which would not change from the status quo. The ranch would continue to graze five of the ten pastures under a continuous grazing system, whereas the other five pastures would remain holding pastures. Stocking rates would continue to be set by customary practice, as determined by the permittee.

NPS Operations

Implementation of the No Action alternative would have no effect on the current operation of the National Park Service

Wilderness

Implementation of the No Action alternative would have no effect on wilderness values. Santa Rosa Island would remain unsuitable for wilderness designation until sometime after 2011, when grazing has been removed and restoration efforts have been completed.

Summary

Under implementation of the No Action alternative, there would continue to be heavy effects on soils, water quality, riparian areas, rare species and their habitats, and vegetation. There would continue to be moderate effects on weed management, wildlife, and archeological resources. There would be slight effects on visitor use. There would be no effect on historical resources, cultural landscapes, the regional economic environment, ranch operations, NPS operations, or wilderness values. Identified effects would continue until cattle grazing ceases in 2011.

Cumulative Effects

The definition of cumulative impact is "the impact on the environment which results from the incremental impact of the action when added to other past, present and reasonably foreseeable future actions" (40 C.F.R. § 1508.7). The cumulative impacts of this No Action alternative therefore are those impacts which result from the incremental impact of this alternative when added to other past, present and reasonably foreseeable future actions, including those effects on a resource in areas beyond the scope of this plan. For example, cumulative impacts to water quality associated with this alternative would result from the incremental impacts of this alternative on water quality when combined with the impacts of other past, present and future actions affecting water quality on other islands in the park and on other grazing lands along the Central Coast of California.

On other islands in the Park, past sheep and cattle grazing have led to heavy impacts on soils (Brumbaugh 1980, Johnson 1980). These impacts include intense hillside gully development and loss of soil from wind and water erosion, due to direct and indirect effects of sheep and cattle grazing, as well as loss of microphytic crust. These impacts have largely abated now that sheep and cattle are gone from these islands. Heavy, adverse effects have occurred to soils on Santa

Rosa Island as a result of past and current ranching operations. These ongoing impacts would not change under this alternative. Because the impacts of the ranching operation on SRI would not change under this alternative, the impacts to soils described above would not experience any incremental change.

Other past, present and future actions affecting water quality and riparian areas in the Central Coast region include the ongoing impacts of ranching activities throughout the Central Coast Region (this region includes Santa Cruz, Santa Clara, San Benito, Monterey, San Luis Obispo and Santa Barbara counties). The water quality problems identified for Santa Rosa Island (discharge of bacteria and sediment) are common among other rangelands in the Central Coast Region (Michael Thomas, Central Coast Regional Water Quality Control Board, personal communication, April 26, 1996). Although the CCRWQC Board has been working with the USFS to incorporate BMPs for water quality improvement into allotment management plans on the Los Padres National Forest, BMPs are not yet in place for most of these rangelands. As a result, there are ongoing, adverse impacts to water quality and riparian areas in other areas of the Central Coast region. If BMPs are implemented on these rangelands, these adverse impacts may be reduced.

As stated in this draft EIS, past grazing by the current permittee on Santa Rosa Island has rendered many drainages non-functional as riparian areas (Rosenlieb et al. 1995). Future grazing at present levels will maintain riparian areas in a non-functional state, at least until 2011 when cattle are removed. Under the No Action alternative, NPS is not undertaking any actions that would change this scenario. This alternative would therefore not result in any additional cumulative impacts to local or regional water quality or to the condition of riparian areas.

Current distribution of vegetation on Santa Rosa Island reflects the effects of past and current ungulate use. Rooting by feral pigs caused substantial damage to native plant communities until pigs were eradicated from the island by NPS in the early 1990's. Under No Action, the current distribution of plant communities on Santa Rosa Island will be maintained until cattle are removed in 2011. As a result, shrub communities will continue to be restricted in range, especially chaparral and coastal sage scrub communities, and annual grassland will continue to dominate the island.

Cumulative effects on vegetation include effects of other activities on vegetation communities on the other Channel Islands. Effects of past ranching activities on vegetation communities have not been restricted to Santa Rosa Island. Across all of the northern Channel Islands, there has been widespread conversion of native shrublands and perennial grasslands to communities dominated by non-native annual grasses and weeds (Brumbaugh 1980, Coblenz 1980, Hobbs 1980, Johnson 1980, Minnich 1980, Coonan et al. 1996). Native plant communities are fragmented and discontinuous, with understories of alien grassland species. Effects on native plant communities on other islands include:

- Reduction in native species cover, density and biomass;
- Increase in cover, frequency and biomass of non-native species, particularly annual grasses and short-lived perennial herbs;
- Lack of recruitment in dominant native woody species;
- Loss of fire-induced successional communities due to inadequate fuels and lack of seed banks.

These effects will continue on Santa Rosa until ungulates are removed, and on Santa Cruz Island until feral pigs and sheep are removed. Future grazing on Santa Rosa at present levels will cause shrub communities to continue to be restricted in range, especially chaparral and coastal sage scrub communities, and annual grassland will continue to dominate the island, at least until 2011 when cattle are removed. Under the No Action alternative, NPS is not undertaking any actions that would change this scenario. This alternative would therefore result in no additional cumulative impacts to vegetation.

As stated previously in this EIS, the effects of past grazing on Santa Rosa Island on island spotted skunk and Santa Cruz gopher snake are not known. However, the effects of such grazing have probably diminished habitat for the skunk, which may prefer riparian areas and upland shrub habitat (Crooks 1994). Similarly, past grazing on Santa Rosa Island has contributed to the maintenance of open annual grasslands and a reduction in shrub communities on the island; these conditions may increase the risk of predation for snakes and may adversely affect the prey base.

The status of the island spotted skunk and Santa Cruz gopher snake on Santa Cruz Island is unknown. Although habitat is generally better on Santa Cruz due to increased cover and greater areal extent of shrub communities, current feral pig rooting and sheep grazing on Santa Cruz may decrease or limit available habitat for both island spotted skunk and Santa Cruz gopher snake. The effects of this limitation of habitat for both species, when combined with the limitation of habitat on Santa Rosa, are unknown. Since these two taxa are limited in geographic range to Santa Cruz and Santa Rosa Islands, the status of the skunk and the snake will not change under current conditions. Limitation of habitat will continue on both islands until ungulates are removed and shrub and riparian habitats begin to recover and expand. Under the No Action alternative, NPS is not undertaking any actions that would change this scenario. This alternative would therefore result in no additional cumulative impacts to wildlife.

Past and current grazing and browsing by non-native ungulates have resulted in heavy, significantly adverse impacts to proposed species and their habitats on Santa Rosa Island (Federal Register 60[142]:37993-38010). These effects are not limited to Santa Rosa Island, but have occurred on all of the northern Channel Islands. In an assessment of the status of rare species and their habitats on the northern Channel Islands, an interagency team concluded that ranching era land-use practices of the past 150 years have resulted in a reduction of geographic range for rare species, and for certain species, a reduction in reproductive success (Coonan et al. 1996). The team's assessment identified the following problems common to rare species on the northern Channel Islands:

- Fragmentation of populations into small, isolated units;
- Lack of reproduction or recruitment in populations;
- Soil loss that exposes root systems to damage;
- Lack of adequate seed banks and seed beds for regeneration from seed;
- On Santa Cruz and Santa Rosa islands, continued rooting, browsing and grazing that removes living plant tissue;
- For wildlife species, lack of adequate cover and forage for successful breeding and rearing of young.

A total of 12 of the 16 northern Channel Islands plants proposed for listing by USFWS occur on islands other than Santa Rosa. The USFWS has determined that these plant taxa and their habitats have been variously affected or are currently threatened by one or more of the following: soil loss, habitat alteration and direct predation by non-native ungulates, habitat alteration by native seabirds, habitat alteration due to vehicular traffic, overcollection for scientific or recreational purposes, competition with alien plant taxa, reduced genetic viability, depressed reproductive vigor, and the chance of stochastic extinction resulting from small numbers of individuals and populations.

Past and current land use practices on Santa Rosa Island have been identified by U.S. Fish and Wildlife Service as a factor contributing to the rarity and possible extirpation of the 11 Santa Rosa species proposed for listing as endangered. Under the No Action alternative, the continuation of current level and extent of grazing/browsing on Santa Rosa Island will continue to degrade habitat, restrict population size, restrict geographical range, reduce recruitment, prevent re-establishment, and diminish long-term viability for the 11 plant species proposed for listing as endangered by USFWS. These effects will not be abated until non-native ungulates are removed from the island in 2011. As a result, some populations may become extirpated from Santa Rosa Island. When combined with current and past adverse effects to proposed species on other northern Channel Islands, these comprise significant, heavy, adverse cumulative effects on proposed species under the No Action alternative.

Although significant past and present effects on western snowy plover, California brown pelican and peregrine falcon populations on a regional and national level have led to their designation as threatened or endangered, implementation of this No Action alternative will result in negligible cumulative effects on these listed species. Recovery of populations of the latter two species in the Southern California Bight will occur regardless of the alternative chosen in this plan. There are now about eight successful breeding pairs of peregrines which nest annually on the northern Channel Islands. Although Channel Islands peregrines still exhibit reproductive and survival problems due to accumulation of organochlorines, USFWS has published a notice of intent to prepare a proposed rule removing peregrines from the list of threatened and endangered species due to overall recovery of the species (Federal Register 60 [126]:34406-409). Cumulative effects on western snowy plover will also be negligible. Although plover nesting habitat in Old Ranch Pasture would continue to be protected by a cattle enclosure under the No Action alternative, nest failure at Skunk Point may remain high due to high winds and predation, and the site may not add significantly to plover production over the range of the species.

Past grazing by non-native ungulates on Santa Rosa Island has led to the trampling of some cultural resources. These resources would continue to experience occasional trampling under the No Action alternative. In other areas of the Channel Islands, removal of non-native ungulates has resulted in protection of cultural resources from trampling, although the effects of current pig rooting and sheep grazing on cultural resources on Santa Cruz island are unknown. Thus, the cumulative impacts to cultural resources at the Park under this alternative would be significant due to the continued trampling of archeological sites on Santa Rosa Island.

Mitigation Required

Not applicable, since no actions are proposed.

ALTERNATIVE B: MINIMAL ACTION

Alternative B, Minimal Action, is the implementation of management actions least likely to affect operations of the grazing and hunting permittee, but that would achieve moderate improvement in water quality in three pastures. This would be accomplished by the immediate closure of Old Ranch Pasture to cattle, and the construction of small riparian exclosures (20 to 80 acres in size) in drainages in two other pastures. Grazing and browsing pressure on rare plants would be reduced by the closure of Old Ranch Pasture and the removal of the island's deer herd over a five year period. The weed management program would be increased as funding allows, in order to address weed management problems on Santa Rosa Island.

Natural Resources

Soils

Under this alternative, there would be heavy effects on soils, as described under the No Action alternative, for all pastures except Old Ranch. In the latter, there would be substantial beneficial effects on soils. Removal of cattle from that pasture would remove the impacts of grazing cattle on soil resources. In Old Ranch, there would thus be decreased trampling of soils, resulting in increased soil stability, increased water availability for vascular plants, and decreased soil loss; increased nutrient availability to plants; and decreased vegetation loss. There would still be off-road vehicle travel by ranch vehicles during elk and deer hunts, with resultant compaction of soils.

Effects on soils in other pastures would not change under this alternative. These impacts would not be reduced until grazing ends in 2011. Stabilization and recovery of those soils should subsequently occur.

There would be no effects to soils from pesticide use proposed under this alternative. Pesticide use would probably remain at or slightly above existing levels (Table 17). The Park uses Garlon 3A (active ingredient triclopyr) and Roundup (active ingredient glyphosate). In soil and in aquatic environments, triclopyr, a selective, systemic herbicide, rapidly converts to an acid, which in turn is neutralized to a salt (EXTOXNET 1993). Triclopyr is rapidly degraded by soil microorganisms. The half-life in soils is from 30 to 90 days, with an average of about 46 days. Triclopyr is readily translocated throughout a plant after being taken up by either roots or the foliage. The estimated half-life in aboveground drying foliage is two to three months. Breakdown by sunlight is the major means of triclopyr degradation in water; the half-life is 10 hours at 25° C.

Glyphosate, a broad-spectrum, non-selective systemic herbicide, is so highly adsorbed on most soils that little is expected to leach from the application area (EXTOXNET 1994). Microbes are responsible for breakdown of the product, and the half-life in soil ranges from 1-174 days. Photodecomposition plays only a minor role in environmental breakdown. Glyphosate may be extensively metabolized by some plants while remaining intact in others. Once in the plant tissue, the chemical is translocated throughout the plant, including to the roots.

The spot treatment method of application minimizes the amount of herbicide that contacts soil.

Water Quality and Riparian Areas

Under the Minimal Action alternative, there would be substantial beneficial effects on riparian areas and water quality within exclosures, and overall, in pastures with exclosures (Pocket Field and North). Water quality within the exclosures, as well as immediately down stream, would also likely improve.

Under this alternative Old Ranch pasture would be closed to cattle, but brood mares would be allowed to remain. The closure of Old Ranch Pasture would likely have substantial beneficial effects on riparian areas, as well as on water quality. Within all of these areas where cattle are excluded, riparian vegetation would likely grow rapidly if appropriate vegetation and/or seed sources are available. However, most riparian areas on the island are devoid of native riparian plants. In these situations restoration efforts would likely be required. Whether recovery occurs naturally or with the assistance of restoration, vegetative cover along stream banks would likely increase. This will have substantial, beneficial effects on riparian areas. The increase in cover would facilitate stabilization of stream banks. As riparian cover increases, sediments would likely be trapped by the vegetation, forming new stream banks and point bars. This in turn would likely provide new riparian habitat. As the process continued, stream width would likely decrease, while stream column depth would increase with the result being narrower and deeper streams.

The improvement in riparian habitat and channel morphology would have substantial, beneficial effects on water quality, which would markedly improve. This would be especially true in Old Ranch Pasture, where a longer segment of the stream would be protected from the effects of unrestricted cattle grazing. With a narrower and deeper stream column, water temperatures would likely decrease. Establishment of shrubby and woody riparian vegetation would likely contribute to this process by providing shade for the stream waters. Suspended sediment levels during storm events would likely not rise as high within excluded areas. Fecal inputs from cattle would likely cease entirely within the exclosures, but some coliform bacteria would likely drift downstream. Newly established riparian vegetation would likely filter out much of the nutrient inputs flowing downstream into exclosures. Water quality would also likely improve immediately downstream of exclosures. But these beneficial effects would likely quickly dissipate downstream due to the condition of the riparian areas within unprotected areas, as well as the continued unregulated access (and therefore inputs) of cattle.

Ten of the 16 streams on the island would not be protected from the effects of unrestricted cattle grazing under this alternative. Effects on those stream reaches would be the same as described for unprotected riparian areas under the No Action alternative.

Cattle impacts to the marsh and lagoon in Old Ranch Pasture would be eliminated. Unnaturally high rates of sedimentation would continue, as a result of continued high stocking levels and erosion in other pastures. Marsh vegetation would continue the present trend toward upland vegetation types, as the marsh continues to dry out.

There would be no effects on water quality from herbicide application under this alternative. Herbicide would not be applied near water, and therefore would be little chance of leaching into

groundwater or surface waters. Glyphosate binds tightly to soil particles and would decompose *in situ* within 1-6 months following treatment. Although triclopyr is much more mobile in the soil (it does not adsorb to soil particles), it breaks down more rapidly in soil (approximately 45 days) and very rapidly in water (10 hours). It is practically non-toxic to fish and aquatic invertebrates.

Vegetation

Exclusion of Cattle from Old Ranch Pasture

The removal of cattle from Old Ranch Pasture will have substantial, beneficial impacts on the vegetation communities in that pasture. Coastal sage scrub and chaparral are two plant communities occurring in Old Ranch Pasture that are habitat for many Park Species of Concern. Effects on coastal sage scrub would be substantial and beneficial. Because cattle are known to browse soft shrubs, such as those that occur in coastal sage scrub, removal of the cattle may lead to improved condition of this community. Removal of cattle would likely have little impact on chaparral. Coastal dune scrub is known to provide habitat for eight of the 10 proposed species. The coastal dune scrub community would likely benefit from the removal of the de-stabilizing effects of trampling and consumption of soil-binding vegetation.

The current impacts of grazing on the marsh in Old Ranch Pasture, a unique habitat on Santa Rosa Island, are unknown. The consequences of removing cattle grazing and trampling is also unknown, but are likely to be beneficial, since cattle grazing and trampling of marsh vegetation would cease. Removal of cattle from Old Ranch Pasture would eliminate cattle impacts to vernal pools in that pasture.

Portions of Old Ranch House Canyon, Quemada Canyon, and the upper and lower marsh have heavy thistle infestations. Species present include bull thistle, milk thistle, and spiny cocklebur. Wildlife and livestock do not forage on these prickly species, so are not currently controlling their spread. It is unlikely that removal of cattle grazing from Old Ranch pasture will cause any increase in extent or density of these weeds. Removal of trampling may lead to reduced spread of these opportunistic species due to decreased presence of disturbed ground for seedling establishment.

Construction of Exclosures

Construction of small riparian exclosures will have positive but limited effects on vegetation. Placement of exclosures around existing native riparian species will protect them from cattle grazing and trampling. This may allow an increase in individual size as well as population size. The exclosures will not prevent grazing, browsing, and trampling by deer and elk. The vegetation within exclosures may become more appealing than outside vegetation, attracting more use by deer and elk. This may prevent any further development of those species favored by deer and elk.

Exclusion of cattle from sections of riparian corridors is likely to have little or no effect on weed populations in those corridors. Perennial weed populations within the exclosures may initially increase with the removal of trampling and grazing. Native vegetation may outcompete and replace opportunistic weeds in a short time. More persistent weeds may take decades to disappear naturally.

Removal of Deer

Removal of deer from Santa Rosa Island will have substantial, beneficial effects on vegetation. Removal likely allow recovery of shrubs and trees that are browsed by deer, including the proposed species *Arctostaphylos confertiflora*. *Castilleja mollis* will no longer be dug up and eaten. In addition to benefits to individual species, removal of deer will allow widespread recovery of shrub and woodland communities, which provide habitat for many rare species. Woodland and shrub communities will likely experience increased recruitment of juveniles and develop more complex understories. Soil erosion may be reduced and, in the long term, stabilization may occur as the native microphytic crust is re-established.

It is unknown whether deer are consuming and thereby controlling or spreading any weed species of concern. Removal of deer is likely to decrease trailing and subsequent soil erosion in shrublands. This may slow the spread of weeds due to lack of bare soil for seedling establishment.

An expanded weed management program would likely reduce the extent, density, and frequency of weed populations. An expanded weed management program would likely prevent the replacement of rare species by weedy species. It may facilitate the restoration of native plant communities where competition from aggressive exotic plants is adversely affecting those communities.

Effects on Forage Production and Availability

As under the No Action alternative, forage utilization would likely remain patchy. Some areas, especially uplands, would likely be underutilized, while other areas, near water sources, would likely be overutilized. Riparian areas within SISTLEs would likely produce considerably more forage than adjacent riparian areas still subject to continuous grazing. Areas away from water would continue to be underutilized.

There are two main exceptions. The first is in Old Ranch Pasture, which under this alternative would be closed to cattle. Forage production would likely increase initially, especially for the perennial grasses like saltgrass (*Distichlis spicata*), and needle grass species like purple needle grass (*Nasella pulchra*). These, which are preferred by cattle, tend to be utilized fully within well-grazed areas of the pasture. Over a longer time interval (several decades), the grassland landscape within the pasture would slowly change into plant communities dominated by shrub species such as coyote bush (*Baccharis pilularis*) and California sagebrush (*Artemisia californica*). Ultimately this would lead to a net decline in forage. But in all likelihood, all non-native grazers and browsers would have left the island long before these changes would be noticeable.

Forage availability within Old Ranch Pasture is another story. Although there would be far more forage produced within the pasture, only elk and horses would have access to the pasture. For the first three years decreasing numbers of deer would also have access to the pasture and its

forage. The net results would be that Old Ranch Pasture would produce far more forage than would be consumed by any herbivores.

The Park would continue to rely on the rank yield method to assess RDM for forage monitoring. The Park would also maintain the 400 lb./ac minimum RDM levels. This is the bare minimum recommended for annual grasslands. Grazing utilization leaving only this amount would likely have moderately adverse effects on perennial components of the island's grasslands, as well as on upland erosion.

Wildlife

Under this alternative, the closure of Old Ranch Pasture to cattle would have substantial, beneficial effects on wildlife populations. Species breeding or utilizing habitat in Old Ranch Pasture include the western snowy plover, the endemic island fox, island spotted skunk, Channel Islands slender salamander and Santa Cruz gopher snake, as well as the Pacific tree frog and island deer mouse. Shorebirds and waterfowl feed on the invertebrate fauna within the lagoon, particularly during migration and wintering.

Small mammals which utilize Old Ranch Pasture would benefit from an increase in cover, seeds and other plant materials as the vegetation slowly recovers. Invertebrate populations within the pasture and lagoon would increase, which would then increase the food base for small mammals, shorebirds, waterfowl and lizards. Lizards would also benefit from an increase in cover. Passerine birds would benefit from an increase in nesting and roosting habitat as well as an increase in the understory and seed plants. Predators, including the gopher snake and birds of prey, would benefit from the increase in mice, lizard, and passerine bird populations.

The creation of small riparian exclosures, or SISTLES, is intended to restore riparian functions to stream segments, and would also have localized benefits for wildlife. Healthy riparian areas tend to support more wildlife species than non-healthy riparian areas, and studies have shown that some of the highest densities of breeding birds in North America occur in riparian habitats. More than 60% of the vertebrates in the arid Southwest are riparian obligates (they occur only in this habitat type), while another 10-20% of the vertebrates are facultative users (present for a portion of the annual cycle but not fully dependent on riparian habitats) of streamside vegetation (Cooperider et al. 1986). Recovery of riparian areas may be beneficial to island spotted skunks, which generally prefer ravines to grassy habitat types (Crooks 1994). Amphibians are much more dependent on riparian areas than are reptiles, due to the fact that amphibians are aquatic or semi-aquatic and lay open-eggs (nonshelled) in water or very moist areas (Cooperider et al., 1986, pp.182).

However, because of the relatively small size of the SISTLES (10 to 80 acres) their value to native wildlife is limited. It has been shown that stands of 28 ha (70 a.) only begin to fill the habitat requirements of some bird species, allowing establishment of a few breeding pairs at best (Cooperider et al. 1986, pp. 175). Considering the species which breed on Santa Rosa and as well as the relative importance of riparian areas, SISTLES of the proposed size might harbor closer to 6-12 breeding pairs of passerines.

Continuity of riparian vegetation along the floodplain is extremely important to small mammals, reptiles, and amphibians. Small, discontinuous blocks, such as those proposed in this alternative, may not fulfill the needs of many of these species. An important feature of riparian zones is their use as corridors for dispersal and genetic continuity between populations. The maintenance of continuous riparian ecosystems is important to help maintain genetic heterogeneity (Cooperider et al. 1986).

The elimination of deer would significantly reduce browse pressure on the chaparral and other habitats. Under this alternative, elimination or reduction of deer should result in a direct and moderately beneficial impact to wildlife populations.

Shrubs and understory plants that are currently utilized by deer would increase when deer are removed, resulting in an increase in plant species preferred by other wildlife. The amount and type of vegetation that would eventually be reestablished is unknown; however, an increase in shrubs and in the understory would be expected.

The island fox, island spotted skunk and deer mouse would benefit from increased cover. In addition, as the understory slowly recovers, the invertebrate populations should increase, which would thus increase the food base for the fox, skunk, and mice. Birds would benefit from an increase in nesting and roosting potential as well as an increase in the understory and seed plants. Lizards would benefit from an increase in cover as well as from the increase in invertebrate/prey populations. Predators, including the gopher snake and birds of prey, would benefit from the increase in mouse and lizard populations.

The deer removal operations would have no permanent impact on native wildlife. Direct disturbances could be caused by people conducting capture and/or hunting operations. These impacts would be short term in nature.

There would be no effects to wildlife from pesticide use proposed under this alternative. Method of application (spot treatment of individual plants) minimizes the amount of herbicide used and that wildlife might contact or ingest. Triclopyr has low chronic toxicity to mammals and is not expected to concentrate to any significant degree in animal tissue (EXTOXNET 1993). Triclopyr is slightly toxic to water fowl and practically non-toxic to fish and aquatic invertebrates. Glyphosate is only slightly toxic to wild birds, and is practically nontoxic to fish (EXTOXNET 1994). There is very low potential for the chemical to accumulate in the tissues of aquatic invertebrates or other aquatic organisms. In mammals, glyphosate is poorly absorbed from the digestive tract and is largely excreted unchanged; it has no significant potential to accumulate in animal tissue.

Rare Species and Their Habitats

Removal of cattle from Old Ranch Pasture would have substantial, beneficial effects on some populations of proposed plant taxa. Six of the ten plant species proposed for listing by USFWS occur presently or have occurred in the past in Old Ranch Pasture. This is the highest concentration of proposed species in any of the pastures. Plants proposed for listing that occur in Old Ranch pasture are *Dudleya blochmaniae* ssp. *insularis*, *Dudleya* sp. nov., *Gilia tenuiflora* ssp. *hoffmannii*, and *Heuchera maxima*. Proposed species that formerly occurred in Old Ranch

that are no longer found there are *Berberis pinnata* ssp. *insularis* (no longer found on the island) and *Phacelia insularis* ssp. *insularis* (does occur in Carrington pasture).

Herbicide use proposed under this alternative would have no effect on listed or proposed species, except in the sense that eradication of alien species eliminates potential competitor for rare and other native plant species. Individual plants would not be affected; the spot method of herbicide application minimizes effects on non-target species. Herbicides would not be applied near populations or individuals of proposed or listed species.

Removal of cattle from Old Ranch pasture would likely benefit all the proposed species that occur there. The elimination of grazing and trampling would likely lead to an increase in the vigor and reproductive success of existing plants and facilitate the expansion of all proposed species populations. Removal of cattle would also decrease the need for vehicles to be in the pasture, reducing the possible occurrence of damage from vehicles.

Western snowy plover nesting habitat on Skunk Point is currently protected by a cattle enclosure fence. However, the wetlands of Old Ranch House Canyon Lagoon, Oat Point, and Old Ranch Canyon creek are important forage areas for western snowy plovers, and are currently only partially protected by the cattle enclosure fence. Plovers occasionally breed in the marsh and lagoon areas. The closure of Old Ranch Pasture and removal of cattle from the area would thus have a slight but positive effect on snowy plovers.

Removal of deer from the island is likely to substantially benefit the proposed species that are believed to be affected by deer browsing: *Berberis pinnata* ssp. *insularis*, *Arctostaphylos confertiflora*, *Arabis hoffmanii*, *Helianthemum greenei*, and *Castilleja mollis*. These species would no longer be subject to browsing by deer, and may consequently exhibit successful reproduction and recruitment, and may expand in geographical range.

Under this alternative, as under all alternatives, NPS would request consultation with USFWS regarding possible effects on listed species, and would request conference regarding possible effects on proposed species. NPS will work with USFWS to arrive at appropriate mitigation measures to avoid impacts to listed and proposed species.

Cultural Resources

Archeological Resources

Closure of Old Ranch Pasture to cattle would have substantial beneficial effects on archeological resources in that pasture. The exclusion of cattle would eliminate cattle impact to the archeological sites in this area, which could include the remains of the first island ranch structures.

Construction of fencing for riparian enclosures may potentially damage the numerous archeological sites on the island and disrupt the historic landscape. However, impact can be reduced by carefully controlling and monitoring this process. No new roads will be constructed in order to place enclosures in drainages. Archeological clearance will be obtained, and the

actions will be subject to compliance under Section 106 of the National Historical Preservation Act (NHPA). If archeological sites are unearthed during fence construction, work will be stopped, the Park archeologist will be consulted, and his recommendations will be followed.

Historical Resources

This alternative would have no effect upon historical structures or their surrounding historic landscape preservation area, since fencing and water developments would not be constructed near historic structures.

Cultural Landscape

Within Old Ranch Pasture, the removal of cattle would replace the current cultural landscape with a landscape more nearly resembling the prehistoric cultural landscape. Since a cultural landscape study has not been completed, it is unknown what effect this would have on potential cultural landscapes. For the same reason, construction of small riparian exclosures would have unknown effects on the cultural landscape. The remainder of the cultural landscape would be substantially unaffected.

Ethnography

Removal of cattle from the Old Ranch pasture would have slight, beneficial effects on ethnographic resources. Exclusion of cattle from Old Ranch would return a more traditional appearance to a portion of the island. Reduction of erosion should reduce the rate at which burials are exposed. Historic Chumash villages in the Old Ranch pasture would be less impacted by erosion.

Socioeconomic Resources

Regional Economic Environment

Implementation of this alternative would have negligible effects on the regional economic environment. The marginal effect on the permittee's operation would represent an insignificant change to regional agriculture/ranching. The removal of deer hunting, likewise, would have negligible effects on the regional economic environment.

Visitor Use

Under the Minimal Action alternative, there would be slight positive effects on visitor use and the visitor experience. Visitor activities currently stress low-impact, low-volume activities. Due to the Park's mandate for low visitation, this approach would not change under this alternative,

nor would visitor use in general on Santa Rosa Island. Recreational opportunities in Old Ranch Canyon could possibly increase under this alternative, if access is less restricted after closure of the pasture to cattle (visitors are currently not allowed access to most of the island unless escorted by a Ranger). In addition, visitors may enjoy their visit more if recovery of the riparian area and uplands in Old Ranch Canyon occurs.

Removal of deer may have both positive and negative effects on the visitor experience. On one hand, removal of the deer will allow eventual recovery of chaparral and coastal sage scrub communities, and visitors may find their island experience more pleasurable because of this. On the other hand, some visitors may find their island experience less pleasing if the deer are not present. The recovery of native shrub and woodland habitats would outweigh the latter, and the overall effect on the visitor experience is likely to be positive.

Construction of small riparian exclosures is likely to have negligible effects on the visitor experience. Visitors may not come in contact with many of the exclosures, due to the limited visitor access to the island. Those who do view the exclosures may find the fences unattractive, but may enjoy seeing recovered riparian areas.

Grazing/hunting Permittee

This action would slightly alter the current operations of the permittee, resulting in a slight adverse impact. The permittee would no longer be able to stock Old Ranch Pasture with cattle. This represents a 7% reduction in the islandwide stocking rate. Any remaining heifers from Old Ranch Pasture would likely be moved to Pocket Field (the other heifer pasture). The reduction in islandwide stocking rate would lead to a commensurate decline in ranch profits.

The construction of SISTLEs would likely have little if any affect on ranch operations. The exclosures would likely be so small as to not affect the stocking rates within any pasture. Cattle would likely still have easy access to water within streams. During inventory and round-up, vaqueros would likely have to take measures to avoid SISTLEs.

Vail & Vickers would incur a loss of commercial hunt revenue due to removal of the deer, though they would retain the revenue from the elk portion of the hunt. Additionally, Vail & Vickers would incur the expense of removing the deer from the island.

NPS Operations

There would be slight, adverse effects on Park operations from implementation of this alternative. The Park would lose any revenue from the grazing fees for the stock that previously grazed in Old Ranch Pasture. The Park would also bear the costs of any increased monitoring costs (riparian or water quality) and any increase in weed eradication efforts.

Wilderness

Wilderness values will remain unaffected by implementation of this alternative. Santa Rosa Island will remain unsuitable for wilderness designation until sometime after 2011, when grazing has been removed and restoration efforts have been completed.

Summary

Under implementation of the Minimal Action alternative, the closure of Old Ranch Pasture to cattle grazing would have substantial, beneficial effects on resources in that pasture, including soils, water quality and riparian areas, vegetation, wildlife, rare species and their habitats, and archeological sites. Water quality, riparian areas, and vegetation would improve in Old Ranch Pasture, and grazing threats to rare species in that pasture would be eliminated.

Removal of the deer will have substantial beneficial effects on vegetation and rare species and their habitats. Removal of the deer will eliminate browsing pressure on several rare plant species islandwide, and will encourage recovery of shrub, chaparral and woodland communities.

Construction of small riparian exclosures (SISTLE's) will have substantial, beneficial effects on resources in the exclosures, including soils, water quality and riparian areas, vegetation, and wildlife. The combination of closing Old Ranch Pasture to cattle grazing and construction of SISTLE's in Pocket Field and North Pastures would markedly improve water quality and the condition of riparian areas in those pastures, which comprise 30% of the island. Consequently, six of the island's 16 second-order drainages would improve in water quality and riparian condition/function.

Effects on the permittee would be slightly adverse, due to overall loss of grazing capacity, loss of revenue from deer hunting, and costs of removing the deer. Effects on NPS operations would also be slightly adverse, due to implementation costs (construction of riparian exclosures, weed management, etc.)

Effects in pastures other than Old Ranch Pasture would be similar to the effects identified under the No Action alternative. There would continue to be heavy effects on water quality and riparian areas in South Pasture, and in streams in North and Pocket Field that are not protected by exclosures. In pastures other than Old Ranch, there would continue to be heavy effects on vegetation, rare plants and habitats, and on soils (where livestock congregate and trail). There would be moderate effects on weed management, wildlife, and archeological resources.

Under this alternative, there would be slight, beneficial effects on visitor use. There would be no effect on historical resources, unknown effects on cultural landscapes, negligible effects on the regional economic environment, and no effect on wilderness values.

Impacts to rare species will be avoided by implementation of mitigation measures derived from consultation and conference with U.S. Fish and Wildlife Service.

Identified effects would continue until cattle grazing ceases in 2011.

Cumulative Effects

On other islands in the Park, past sheep and cattle grazing have led to heavy impacts on soils (Brumbaugh 1980, Johnson 1980). These impacts include intense hillside gully development and loss of soil from wind and water erosion, due to direct and indirect effects of sheep and cattle grazing, as well as loss of microphytic crust. These impacts have largely abated now that sheep and cattle are gone from these islands. Heavy, adverse effects have occurred to soils on Santa Rosa Island as a result of past and current ranching operations. Under this alternative, the closure of Old Ranch Pasture and the construction of riparian exclosures will have substantial beneficial impacts on soils. However, the cumulative impact of this alternative will be offset by adverse impacts to soils in other areas of the island and the Central Coast area.

Other past, present and future actions affecting water quality and riparian areas in the Central Coast region include the ongoing impacts of ranching activities throughout the Central Coast Region (this region includes Santa Cruz, Santa Clara, San Benito, Monterey, San Luis Obispo and Santa Barbara counties). The water quality problems identified for Santa Rosa Island (discharge of bacteria and sediment) are common among other rangelands in the Central Coast Region (Michael Thomas, Central Coast Regional Water Quality Control Board, personal communication, April 26, 1996). Although the CCRWQC Board has been working with the USFS to incorporate BMPs for water quality improvement into allotment management plans on the Los Padres National Forest, BMPs are not yet in place for most of these rangelands. As a result, there are ongoing, adverse impacts to water quality and riparian areas in other areas of the Central Coast region. If BMPs are implemented on these rangelands, these adverse impacts may be reduced.

As stated in this draft EIS, past grazing by the current permittee on Santa Rosa Island has rendered many drainages non-functional as riparian areas (Rosenlieb et al. 1995). The closure of Old Ranch Pasture to cattle and the construction of small riparian exclosures would begin to restore riparian function to Santa Rosa Island drainages, and would be a substantial, beneficial effect on water quality. Therefore, under Minimal Action there would be a slight positive cumulative effect on water quality in the Central Coast Region.

Other past, present and future actions affecting vegetation, which are detailed in the cumulative effects section of the No Action alternative, mainly result from past ranching activities on other northern Channel Islands and ongoing feral pig and sheep damage on Santa Cruz Island. In general, these actions have caused widespread conversion of native shrublands and perennial grasslands to communities dominated by non-native annual grasses and weeds. Though annual grassland will continue to dominate the island under this Minimal Action alternative, the removal of deer would reduce browsing pressure on shrub communities, and chaparral and coastal sage scrub may begin to recover. Additionally, vegetation communities in Old Ranch Pasture would begin to recover. Recovery of chaparral and coastal sage scrub communities on Santa Rosa could add substantially to the extent of those communities on the northern Channel Islands. Chaparral currently occupies about 18,000 acres on Santa Cruz Island, and 2,600 acres on Santa Rosa. Removal of deer would also reduce browsing pressure on Bishop pine woodland, which on the islands, only occurs on Santa Cruz and Santa Rosa Island. Thus, implementation of this alternative would have substantial beneficial cumulative effects on shrub and woodland communities of the northern Channel Islands.

The effects on wildlife of past and future grazing on Santa Rosa Island are unknown because habitat preference and utilization remain unknown for species such as the Channel Island spotted skunk and the Santa Cruz gopher snake. However, grazing has probably diminished habitat for the skunk, which may prefer riparian areas and upland shrub habitats (Crooks 1985). Similar effects on habitat for the Santa Cruz gopher snake include the maintenance of open annual grasslands and reduction of shrub communities, ; these conditions may increase the risk of predation for snakes and may adversely affect the prey base.

The status of the island spotted skunk and Santa Cruz gopher snake on Santa Cruz Island is unknown. Although habitat is generally better on Santa Cruz due to increased cover and greater areal extent of shrub communities, current feral pig rooting and sheep grazing on Santa Cruz may decrease or limit available habitat for both island spotted skunk and Santa Cruz gopher snake. The effects of this limitation of habitat for both species, when combined with the limitation of habitat on Santa Rosa, are unknown. Since these two taxa are limited in geographic range to Santa Cruz and Santa Rosa Islands, the status of the skunk and the snake would not change under this alternative. Limitation of habitat will continue on both islands until ungulates are removed and shrub and riparian habitats begin to recover and expand. Implementation of this Minimal Action alternative would have slight beneficial effects on these species in Old Ranch Pasture (due to removal of cattle from that pasture) but would have little overall effect on these species.

Heavy, significantly adverse impacts to rare species and their habitats are the result of the combined effects of past and current grazing and browsing by non-native ungulates. These effects are not limited to Santa Rosa Island, but have occurred on all of the northern Channel Islands, and are discussed under the Cumulative Effects section for the No Action alternative. Past and current land use practices on Santa Rosa Island have been identified by U.S. Fish and Wildlife Service as a factor contributing to the rarity and possible extirpation of the 11 Santa Rosa species proposed for listing as endangered. Under the Minimal Action alternative, the closure of Old Ranch Pasture to cattle grazing and the removal of deer from the island would result in significant beneficial effects on rare species, thus beginning to reverse the negative cumulative effects of past land use practices. Of the 11 species proposed for listing as Endangered, four occur only on Santa Rosa, and thus the actions proposed under this alternative would benefit each taxon over the entire range of its distribution. Four other species are extant on Santa Rosa and occur or previously occurred on other islands. These taxa would accrue benefits for a portion of their range or former range. The two remaining species are thought to be extirpated on Santa Rosa Island, but are known to occur on other islands. These taxa would also accrue benefits for a portion of their range or former range. The benefits to Santa Rosa species from implementation of this alternative would comprise a significant beneficial effect on rare species on the northern Channel Islands.

Although significant past and present effects on western snowy plover, California brown pelican and peregrine falcon populations on a regional and national level have led to their designation as threatened or endangered, implementation of this Minimal Action alternative will result in negligible cumulative effects on these listed species. Recovery of populations of the latter two species in the Southern California Bight will occur regardless of the alternative chosen in this plan. There are now about eight successful breeding pairs of peregrines which nest annually on the northern Channel Islands. Although Channel Islands peregrines still exhibit reproductive and survival problems due to accumulation of organochlorines, USFWS has published a notice of intent to prepare a proposed rule removing peregrines from the list of threatened and endangered

species due to overall recovery of the species (Federal Register 60 [126]:34406-409). Cumulative effects on western snowy plover will also be negligible. Although plover nesting habitat in Old Ranch Pasture would be protected by closure of Old Ranch Pasture to cattle grazing, nest failure at Skunk Point may remain high due to high winds and predation, and the site may not add significantly to plover production over the range of the species.

Moderate, significantly adverse effects on cultural resources have occurred due to effects of past trampling by non-native ungulates. Under this Minimal Action alternative, future cattle trampling in all pastures but Old Ranch would exacerbate damage to archeological sites from past and current grazing, and from past rooting by feral pigs. Indirect cumulative effects on archeological sites in all pastures but Old Ranch include further loss of cultural materials from sites due to erosion, which is exacerbated by the effects of ungulates on vegetation.

Under this Minimal Action alternative, cumulative effects on the permittee (ranch operations) would be slightly adverse, due to economic impacts such as loss of overall grazing capacity on the island, and costs incurred from removing the deer.

Mitigation Required

Under implementation of the Minimal Action alternative, mitigation would be required to prevent damage to archeological sites from fencing construction for small riparian exclosures. Construction of fencing for riparian exclosures may potentially damage the numerous archeological sites on the island and disrupt the historic landscape. However, impact can be reduced by carefully controlling and monitoring this process. No new roads will be constructed in order to place exclosures in drainages. Archeological clearance will be obtained, and the actions will be subject to compliance under Section 106 of the National Historical Preservation Act (NHPA). If archeological sites are unearthed during fence construction, work will be stopped, the Park archeologist will be consulted, and his recommendations will be followed.

Visitor use and access would need to be controlled while deer removal is occurring. NPS would also need to oversee removal operations to insure no impacts to other resources from vehicles, etc. Therefore, NPS will require the permittee to submit a detailed removal plan, with timetable, subject to NPS approval. NPS staff will be on hand to oversee removal activities.

To avoid impacts to listed and proposed species, the Park would implement any mitigation measures derived through consultation and conferencing with USFWS.

ALTERNATIVE C: TARGETED MANAGEMENT ACTION

Alternative C, Targeted Management Action, is the implementation of a combination of management actions intended to achieve significant improvement in water quality in two pastures. This would be accomplished by the closure of Old Ranch Pasture to cattle and horses, and the implementation of rotational grazing in North Pasture. The latter would be split by construction of a fence along the Smith Highway, and the riparian areas in the lowland areas (Brockway Pasture) would not be grazed during the hot season. To facilitate summer grazing in the upland portion of North (Black Mountain Pasture), three water developments would be constructed. Grazing and browsing pressure on rare plants would be reduced by the closure of

Old Ranch Pasture and the removal of the island's deer herd over a three year period, as well as a slight reduction in the island's elk herd. Small riparian exclosures would be used as restoration tools and to protect key riparian resources. Minimum Residual Dry Matter (RDM) standards would be raised to protect upland areas. The weed management program would be increased as funding allows, in order to address weed management problems on Santa Rosa Island.

Natural Resources

Soils

Under this alternative, there would be substantial beneficial effects on soils in Old Ranch Pasture. Removal of cattle from that pasture would remove the impacts of grazing cattle on soil resources. In Old Ranch, there would thus be decreased trampling of soils, resulting in increased soil stability, increased water availability for vascular plants, and decreased soil loss; increased nutrient availability to plants; and decreased vegetation loss. There would still be off-road vehicle travel by ranch vehicles during elk and deer hunts, with resultant compaction of soils.

Effects on soils in other pastures would not change under this alternative, except for the following. Increase of Residual Dry Matter (RDM) standards from 400 lb./ac to 1000 lb./ac will protect upland soils from erosion by maintaining more standing biomass (RDM) prior to the onset of fall/winter rains, and will result in moderately beneficial effects on soil resources. However, erosion may be greater on slopes in riparian areas and near the proposed water developments in Black Mountain Pasture, due to increased concentration of livestock in these areas. Increased seasonal stocking density in riparian areas in Brockway and Black Mountain may increase local erosion in these areas. If cattle and/or elk and deer are attracted to the small riparian exclosures, then there may be increased erosion from trampling in these areas. These impacts to soils would not be reduced until grazing ends in 2011. Stabilization and recovery of those soils should subsequently occur.

There would be no effects to soils from pesticide use proposed under this alternative. Pesticide use would probably remain at or slightly above existing levels (Table 17). The Park uses Garlon 3A (active ingredient triclopyr) and Roundup (active ingredient glyphosate). In soil and in aquatic environments, triclopyr, a selective, systemic herbicide, rapidly converts to an acid, which in turn is neutralized to a salt (EXTOXNET 1993). Triclopyr is rapidly degraded by soil microorganisms. The half-life in soils is from 30 to 90 days, with an average of about 46 days. Triclopyr is readily translocated throughout a plant after being taken up by either roots or the foliage. The estimated half-life in aboveground drying foliage is two to three months. Breakdown by sunlight is the major means of triclopyr degradation in water; the half-life is 10 hours at 25° C.

Glyphosate, a broad-spectrum, non-selective systemic herbicide, is so highly adsorbed on most soils that little is expected to leach from the application area (EXTOXNET 1994). Microbes are responsible for breakdown of the product, and the half-life in soil ranges from 1-174 days. Photodecomposition plays only a minor role in environmental breakdown. Glyphosate may be extensively metabolized by some plants while remaining intact in others. Once in the plant tissue, the chemical is translocated throughout the plant, including to the roots.

The spot treatment method of application minimizes the amount of herbicide that contacts soil.

Water Quality and Riparian Areas

Under implementation of Targeted Management, there would be substantial, beneficial effects on water quality and riparian areas due to three actions. The first would be the closure of Old Ranch Pasture. The second would be the creation of riparian exclusions throughout the island. The third would be the implementation of a rotational grazing system in the split North Pasture. Each action would likely have substantial, beneficial effects on riparian vegetation, stream bank stability, hydrologic functioning, and water quality.

Within all of these areas where cattle are excluded (Old Ranch Pasture and the small riparian exclusions), substantial beneficial effects are the same as described under the previous alternative: recovery of riparian vegetation, stabilization of stream banks, and improvement in water quality. Restoration may be required if native vegetation or seed sources are inadequate for natural recovery.

Riparian areas within the new Brockway Pasture would also likely improve, although the rate of recovery would probably not be as fast as in areas excluded to cattle. Under the proposed action, Brockway Pasture would be rested throughout the summer drought, when cattle utilization of riparian areas is usually highest. The summer rest would likely allow existing riparian vegetation to recover from the effects of defoliation and trampling. Because riparian vegetation has access to water, the lack of rainfall would not inhibit summer growth. In many cases where there is riparian vegetation nearby or seed sources upstream, new riparian vegetation may become established in current bare areas. As riparian vegetative cover increases, stream banks would likely become more stable. The stabilized banks would be less likely to erode during storm events. Expanding riparian vegetation would likely trap suspended sediments, creating more riparian habitat. Stream channels would likely become more narrow and deep. These are all the same recovery processes which would occur in areas where cattle have been excluded. The rate and extent of recovery would likely be much slower than in those areas totally excluded to cattle grazing.

During the winter months, when Brockway Pasture would be grazed, the riparian areas would likely receive greater grazing pressure than they currently do. This is because there would be twice as many animals grazing in the pasture than currently graze during the winter. Fortunately, cattle are well dispersed through the pasture during the winter rain season when the upland forage is green. It is during the hot, dry summer months that cattle use of riparian areas increases dramatically.

Overall effects on water quality and riparian areas in Brockway Pasture would be substantial and beneficial, due to warm season rest of that pasture.

Water Windmill and Cherry Canyons in Black Mountain Pasture would likely experience the brunt of the increased use of riparian areas during the summer months. Under the proposed action twice as many cattle would graze Black Mountain Pasture during the summer drought. Cattle would most likely spend a disproportionate amount of time in riparian areas.

To mitigate this eventuality, three water developments would be constructed. The water developments would be placed in locations to encourage cattle to leave riparian areas and take advantage of upland forage. Two SISTLEs would also be constructed to protect small stretches of streams within the pasture. Black Mountain Pasture would not be grazed during the cool winter season, and stream reaches within the pasture would likely recover somewhat during the period of rest. Riparian vegetation would likely recover to a certain degree during rest. Water quality would also likely improve during rest. Urine and fecal inputs would cease, leading to less nutrients available for *Cladophora* algae. Fecal coliform levels would also likely drop as well. But the rate of recovery would likely be far less than what would be expected in excluded areas or stream reaches within the Brockway pasture.

Despite the mitigation efforts, many of the stream reaches within Black Mountain Pasture would likely receive more grazing pressure than they currently do, and overall effects on water quality and riparian areas would be slightly adverse, compared to current impacts. This would likely offset many of the gains made by riparian areas during the summer rest, inhibiting recovery. Existing riparian vegetation cover may even be reduced, leading to further destabilization of stream banks. Sediment loads would likely remain high during storm events, indicating continued accelerated levels of erosion within affected watershed. The stream water column would likely remain unnaturally shallow and wide. Fecal and urine inputs into stream waters would likely increase dramatically during the summer grazing season. Coliform levels would likely exceed standards for the water contact recreation (REC-1) beneficial use.

Stream reaches within the South and Pocket Field pastures would receive minimal additional protection. Several drainages would have SISTLEs constructed within them, but the amount of stream corridor protected would be relatively small. Consequently, the majority of the stream reaches within these drainages would likely suffer from the same effects described for unprotected streams under the No Action alternative.

Overall, though, the gains in riparian area protection and improved water quality under Targeted Management would likely outweigh the deleterious impacts of summer seasonal grazing in Black Mountain Pasture and continuous grazing in Pocket Field and South Pastures. Closing Old Ranch pasture, implementing winter seasonal grazing in Brockway Pasture, and constructing SISTLEs throughout the island would result in substantial beneficial effects on water quality and riparian areas.

Cattle impacts to the marsh and lagoon in Old Ranch Pasture would be eliminated. Unnaturally high rates of sedimentation would continue, as a result of continued high stocking levels and erosion in other pastures. Marsh vegetation would continue the present trend toward upland vegetation types, as the marsh continues to dry out.

There would be no effects on water quality from herbicide application under this alternative. Herbicide would not be applied near water, and therefore would be little chance of leaching into groundwater or surface waters. Glyphosate binds tightly to soil particles and would decompose *in situ* within 1-6 months following treatment. Although triclopyr is much more mobile in the soil (it does not adsorb to soil particles), it breaks down more rapidly in soil (approximately 45 days) and very rapidly in water (10 hours). It is practically non-toxic to fish and aquatic invertebrates.

Vegetation

Effects on vegetation from the closure of Old Ranch Pasture to cattle and horses, from establishment of small riparian exclosures (SISTLE's), and from removal of deer are identical to the anticipated effects in Alternative B, with the following exceptions.

The removal of cattle from Old Ranch Pasture will have substantial, beneficial impacts on the vegetation communities in that pasture. Removal of horses will have the following effects. Horse use of Old Ranch Pasture is small in relation to cattle use. Horses are not known to browse coastal sage scrub. Otherwise, removing horses would likely provide small additional benefits of the same nature as removing cattle. Removing both would provide an increased opportunity for natural ecosystem processes to begin to re-establish in Old Ranch Pasture. An additional benefit of removing horses from Old Ranch Pasture is the reduced opportunity for introduction of fennel by horses from other pastures.

Construction of small riparian exclosures will have positive but limited effects on vegetation. Effects will be less than under the Minimal Action alternative, only nine exclosures would be constructed (compared to the 15 that would be constructed under the Minimal Alternative).

Division of North Pasture and Implementation of Rotational Grazing

The division of North Pasture and the implementation of rotational grazing between Brockway and Black Mountain Pastures, overall, is likely to have negligible effects on vegetation:

Construction of the fence is unlikely to impact any rare plant resources. Impacts to riparian areas will be avoided by careful siting and construction of fence in drainage bottoms.

Summer cattle use of Black Mountain Pasture will increase over pre-1997 levels, due to the cattle previously spending more time near the riparian areas in what will become Brockway Pasture. Black Mountain Pasture will contain a significant portion of the island's chaparral and woodland communities and their many resident rare species. Intensified cattle use in this area has the potential to negatively impact rare plants in these communities, as well as degrade the communities themselves, due to increased browsing, trailing, and loafing in the shade of these communities. These effects would be mitigated by construction of water developments and an increase in Residual Dry Matter (RDM) standards from 400 to 1000 lb./ac. Construction of water developments will draw cattle away from riparian areas, and shrub and woodland habitats. Implementation of the 1000 lb./ac RDM standard may prevent these negative impacts. Depending on the time of shoot elongation of the woody species, warm season grazing may postpone browsing of these new shoots by cattle. This may result in improved vigor for shrubby species, especially when shoots are able to get beyond browsing's reach.

Relief from grazing and trampling during the growing season may allow riparian species to begin to establish in the Brockway Pasture canyons. The rate of establishment will depend on the amount of reproductive material (seeds and asexual propagules) present as well as the amount of new growth that survives the subsequent six month grazing season. Because the pasture will be grazed in the "cool" season (November 1 - April 30), which is also the season for greatest upland grass growth, it is possible that utilization of the riparian areas will be reduced from current levels. However, without upland water developments in Brockway pasture, it is likely that the

riparian areas will continue to be areas of cattle concentration and impact. Additionally, without a period of initial rest (at least 2 years), it is likely that riparian vegetation will never get above the reach of grazing, and so will be unable to aid in improvement of either water quality or status of rare plant and animal species. In dry years, removal of grazing by May 1 may be too late to allow establishment of new riparian growth. Overall, there may be no difference from current effects on vegetation in Brockway Pasture.

Division of North Pasture and implementation of rotational grazing is likely to have little or no effect on weed species.

Construction of water developments in Black Mountain Pasture is likely to have the following effects on vegetation. Cattle and wildlife use in Black Mountain Pasture will likely become concentrated around the water developments. At the Round Top and Army Camp locations, this will likely not cause any discernible changes in vegetation since these are currently grasslands composed of alien annuals.

If deer are removed from the island concurrently with water development, this will prevent increased use of the area by those animals most likely to cause negative impacts. Cattle and elk may still cause measurable impacts, due to trailing, bedding, and some amount of browsing.

It is likely that thistle populations will establish in proximity to water developments.

Reduction of Elk Herd

Reducing the elk population will have moderately beneficial effects on vegetation. Elk are primarily grazers and so have many of the same effects on island vegetation as cattle. Additionally, elk have been implicated in predation on juvenile and mature *Pinus remorata* (Bartolome 1991). Reducing the number of elk on the island would likely reduce grazing, browsing, and trailing impacts on rare species and their habitats.

Increase in Residual Dry Matter Standards

Adjusting RDM standards (raise from 400 lb./ac to 1000 lb./ac) will have moderately beneficial effects on vegetation. Removal of cattle from a pasture when Residual Dry Matter declines to 1000 lb./ac instead of 400 lb./ac may allow for the expansion of perennial grasses and shrubs (*Baccharis pilularis*) into the annual grasslands. Coastal sage scrub, coastal bluff scrub, and lupine scrub communities may expand as cattle are removed from a pasture prior to their being "forced" to look for alternative forage. Such expansion would likely benefit the 3-dozen-plus Species of Concern that occur in these communities.

Increased residual biomass may reduce establishment of weeds due to lack of bare ground for seedling establishment.

Forage Production and Availability

In South, Pocket Field, Lobo, Carrington and Wire Field pastures, implementation of Targeted Management would have little impact on forage production and availability, because forage production would not change from current levels. The increase in the minimum RDM would

likely not affect forage production for annual species, and may lead to some increases in production for perennial species. Forage utilization through much of the island would remain patchy.

The effects on forage availability in Old Ranch Pasture due to closure of that pasture to cattle and horses would be generally as described under the previous alternative: increase in forage production, but available only to elk.

A major change in forage production and availability would result from the split of North Pasture. Under the proposed action, North Pasture would be split into two new pastures: Brockway and Black Mountain. Brockway Pasture would be grazed during the winter rainy season, whereas Black Mountain Pasture would be grazed during the summer drought. This new grazing system would likely affect production and utilization of forage in several ways.

Within Brockway Pasture, utilization may approximate forage production. There may be periods, particularly during the earliest portion of green-up, when there would be inadequate new forage to support the cattle herd. When grass seedlings first emerge, they are composed of up to 90% water. Cattle grazing upon this new tender forage would have to eat significantly more grass to obtain the equivalent dry weight forage. Cattle frequently lose weight during this time. This is why adequate amounts of residual dry matter will be critical. Leaving a minimum of 1000 lb./ac of RDM would likely ensure enough forage to sustain cattle through the early portion of green up. When the weather warms up, the grasses grow rapidly and the proportion of water within each blade decreases substantially. Grass biomass production would likely exceed utilization during the spring, and implementation of the 1000 lb./ac RDM levels would result in more biomass left at the end of the grazing season (in April) than is currently left. During the summer drought Brockway Pasture would be rested. Although little forage production would occur in the uplands during the summer, perennial grasses such as alkali rye (*Leymus triticoides*), pacific rye (*L. pacifica*), and saltgrass (*Distichlis spicata*) would likely experience some summer regrowth. Vegetation within the riparian area would likely experience substantial regrowth during the summer rest. Riparian vegetation would have access to water and would likely respond well to the warm summer temperatures. Indeed, one of the goals of the rotational grazing system is to allow for significant summer growth during the summer rest from cattle grazing. Overall effects on forage would be moderate and beneficial.

Black Mountain Pasture would have an almost opposite pattern of production and utilization than that of Brockway Pasture. Under this alternative, Black Mountain Pasture would be rested during the winter rainy season and grazed during the summer drought. Annual grasses would germinate, grow, flower, set seed, and die before cattle would be turned out into the pasture. Perennial grasses would grow, flower, and set seed prior to being grazed. Studies have shown that perennial grasses have better survivorship and recruitment when grazed under a deferred grazing system, than if grazed during the spring. Cattle grazing Black Mountain Pasture would be eating cured forage almost exclusively. Although not as palatable, the cured forage usually maintains the majority of its nutrients. Overall effects on forage in Black Mountain would be moderate and beneficial.

Wildlife

Effects on wildlife from the closure of Old Ranch Pasture to cattle and horses, from establishment of small riparian exclosures (SISTLE's), and from removal of deer are identical to the anticipated effects under Minimal Action. The closure of Old Ranch Pasture to cattle would have substantial, beneficial effects on wildlife populations. Establishment of small riparian exclosures would have localized, moderate beneficial effects on wildlife. Removal of deer would have moderate, beneficial effects on wildlife.

Under Alternative C, North Pasture will be split into two smaller pastures, Black Mountain and Brockway Pastures, and a seasonal rotational system will be implemented in those two pastures. Additionally, the minimum standards for RDM will be raised from 400 lb./ac to 1000 lb./ac. These changes in grazing management may be slightly beneficial to wildlife. Black Mountain Pasture is predominately an upland/grassland habitat, while Brockway Pasture contains significant reaches of riparian habitat. The amount and type of vegetation change which will occur in these pastures due to the rotational grazing strategy is unknown, so effects on wildlife habitat are largely unknown.

Wildlife utilization in Black Mountain Pasture may increase if habitat quality increases due to changes in grazing management. An increase in minimum RDM from 400 to 1,000 lb./ac may be accompanied by an increase in cover and seed grasses and an increase in invertebrates, which would increase the food base for fox, skunk, and mice. Birds would benefit from an increase in seed plants. Lizards would benefit from an increase in cover as well as from an increase in invertebrate/prey populations. Predators, including the gopher snake and birds of prey, would benefit from the increase in mouse and lizard populations.

However, if an increase in minimum RDM does not result in an increase in seed grasses and/or cover, most of the upland/grassland habitat will not be suitable for native terrestrial vertebrates, and there would be no beneficial effects in wildlife habitat from raising RDM standards. Invertebrate populations may still increase, thus increasing the food base for the fox and skunk. Mice and lizards would be able to utilize the increase in invertebrates along habitat edges, where some type of cover meets the open grassland. These edge habitats are where any benefit to predators would be seen.

The construction of water developments should have no permanent impact on native wildlife. Wildlife may use the water catchments when cattle are not using the area. The native wildlife are adapted to the existing availability of water on the island.

There would be no effects to wildlife from pesticide use proposed under this alternative. Method of application (spot treatment of individual plants) minimizes the amount of herbicide used and that wildlife might contact or ingest. Triclopyr has low chronic toxicity to mammals and is not expected to concentrate to any significant degree in animal tissue (EXTOXNET 1993). Triclopyr is slightly toxic to water fowl and practically non-toxic to fish and aquatic invertebrates. Glyphosate is only slightly toxic to wild birds, and is practically nontoxic to fish (EXTOXNET 1994). There is very low potential for the chemical to accumulate in the tissues of aquatic invertebrates or other aquatic organisms. In mammals, glyphosate is poorly absorbed from the digestive tract and is largely excreted unchanged; it has no significant potential to accumulate in animal tissue.

Rare Species and Their Habitats

Effects on threatened and endangered species from the closure of Old Ranch Pasture to cattle and horses, from establishment of small riparian exclosures (SISTLE's), and from removal of deer are identical to the anticipated effects in Alternative B, with the following exceptions.

The closure of Old Ranch Pasture to cattle and horse grazing would have substantial, beneficial effects on rare plant populations in that pasture. Effects of horse grazing on rare plant populations in Old Ranch Pasture are unknown, but are thought to be much less than effects of cattle.

Removal of deer and reduction of elk (from 1100 to 450 animals) would have substantial, beneficial effects on rare plant populations, islandwide. The three year time frame for removal would reduce effects on rare species more quickly than the five year time frame under the previous alternative.

Intensified cattle use in Black Mountain Pasture, and around the proposed water developments may negatively impact rare plants in chaparral and woodland habitat, as well as degrading these communities themselves, due to increased browsing, trailing, and loafing in the shade of these communities. These possible adverse effects would be mitigated by construction of water developments to improve distribution of cattle, and the proposed increase in RDM standards.

Herbicide use proposed under this alternative would have no effect on listed or proposed species, except in the sense that eradication of alien species eliminates potential competitor for rare and other native plant species. Individual plants would not be affected; the spot method of herbicide application minimizes effects on non-target species. Herbicides would not be applied near populations or individuals of proposed or listed species.

Effects on western snowy plover from Alternative C are identical to the effects described for Alternative B.

Under this alternative, as under all alternatives, NPS would request consultation with USFWS regarding possible effects on listed species, and would request conference regarding possible effects on proposed species. NPS will work with USFWS to arrive at appropriate mitigation measures to avoid impacts to listed and proposed species.

Cultural Resources

Archeological Resources

As described under the Minimal Action alternative, closure of Old Ranch Pasture to cattle would have substantial beneficial effects on archeological resources in that pasture. The exclusion of cattle would eliminate cattle impact to the archeological sites in this area, which could include the remains of the first island ranch structures.

Construction of fencing for riparian exclosures may potentially damage the numerous archeological sites on the island and disrupt the historic landscape. However, impact can be reduced by carefully controlling and monitoring this process. No new roads will be constructed in order to place exclosures in drainages. Archeological clearance will be obtained, and the actions will be subject to compliance under Section 106 of the National Historical Preservation Act (NHPA). If archeological sites are unearthed during fence construction, work will be stopped, the Park archeologist will be consulted, and his recommendations will be followed.

A decrease in the elk population would decrease the minimal impact of elk on archeological sites. Vehicular traffic associated with the elk hunt would continue to offer the potential to impact archeological sites. There would effectively be no change from current conditions (No Action)

Historical Resources

This alternative would have no effect upon historical structures or their surrounding historic landscape preservation area, since fencing and water developments would not be constructed near historic structures.

Cultural Landscape

Within Old Ranch Pasture, the removal of cattle would replace the current cultural landscape with a landscape more nearly resembling the prehistoric cultural landscape. Since a cultural landscape study has not been completed, it is unknown what effect this would have on potential cultural landscapes. For the same reason, construction of small riparian exclosures would have unknown effects on the cultural landscape. The remainder of the cultural landscape would be substantially unaffected.

Ethnography

Removal of cattle from the Old Ranch pasture would have slight, beneficial effects on ethnographic resources. Exclusion of cattle from Old Ranch would return a more traditional appearance to a portion of the island. Reduction of erosion should reduce the rate at which burials are exposed. Historic Chumash villages in the Old Ranch pasture would be less impacted by erosion.

Socioeconomic Resources

Regional Economic Environment

Implementation of this alternative would have negligible effects on the regional economic environment. The slight adverse effect on the permittee's operation would represent an

insignificant change to regional agriculture/ranching. The removal of deer hunting, likewise, would have negligible effects on the regional economic environment.

Visitor Use

Under the Targeted Management Action alternative, there would be slight positive effects on visitor use and the visitor experience. Visitor activities currently stress low-impact, low-volume activities. Due to the Park's mandate for low visitation, this approach would not change under this alternative, nor would visitor use in general on Santa Rosa Island. Recreational opportunities in Old Ranch Canyon could possibly increase under this alternative, if access is less restricted after closure of the pasture to all livestock (visitors are currently not allowed access to most of the island unless escorted by a Ranger). In addition, visitors may enjoy their visit more if recovery of the riparian area and uplands in Old Ranch Canyon occurs.

The splitting of North Pasture into Brockway and Black Mountain Pastures may have both positive and negative effects on the visitor experience. Visitors may find the fence along Smith Highway to be an eyesore. Recovery of riparian areas in Brockway will enhance the visitor experience, but the higher stocking density in Black Mountain during the summer and the construction of water catchments in that pasture may somewhat diminish the visitor experience in this area of the island.

Removal of deer and reduction of elk may have both positive and negative effects on the visitor experience. On one hand, removal of the deer will allow eventual recovery of chaparral and coastal sage scrub communities, and visitors may find their island experience more pleasurable because of this. On the other hand, some visitors may find their island experience less pleasing if the deer are not present.

Construction of small riparian exclosures is likely to have negligible effects on the visitor experience. Visitors may not come in contact with many of the exclosures, due to the limited visitor access to the island. Those who do view the exclosures may find the fences unattractive, but may enjoy seeing recovered riparian areas.

Raising the minimum RDM level from 400 to 1000 pounds per acre may protect upland areas more, and no pastures would appear overgrazed. However, riparian areas in most pastures will still be heavily utilized, negatively affecting the visitor experience.

Grazing/hunting Permittee

Implementation of the Targeted Management Action alternative would have a moderate, adverse impact to the permittee's operation, which would be slightly altered. The permittee would no longer be able to stock Old Ranch Pasture with cattle or horses. This represents a 7% reduction in the islandwide stocking rate. Any remaining heifers from Old Ranch Pasture would likely be moved to Pocket Field (the other heifer pasture). The 7% reduction in islandwide stocking rate would probably lead to a slight decline in ranch profits, though the actual amount of the decline is unknown.

The implementation of the rotational grazing strategy in the former North Pasture would most likely need a period of fine tuning, where stocking levels and timing are worked out. The timing of movement of cattle between the two new pastures was designed to coincide with existing ranch schedules. Currently the ranch begins roundup in April, and inventory in October. Rotation of cattle between the new Brockway and Black Mountain Pastures would occur at approximately the same time. The ranch may need to shift the schedule of which pastures are dealt with first, depending upon weather factors. For instance if forage on the north side of the island "browns out" (cures) early, then rotation from Brockway Pasture to Black Mountain Pasture may need to occur earlier than if the island receives late spring rains. The intent of the rotational grazing system is to fit into the existing calendar of events of the ranch on the island.

Raising the minimum RDM levels to 1000 lb./ac average per pasture would likely have a substantial impact on ranch operations during years of poor forage production (e.g. drought). In those years, more cattle may need to be taken off the island, or less shipped to the island, in order to meet the RDM standards. Effect on ranch profits is unknown, though would likely be commensurate with the number of cattle that need to be removed. Data from the past three years of forage monitoring (all average or above average precipitation years) indicates that in most pastures the ranch would have few problems maintaining an average of 1000 lb./acre of RDM. The Horse Pasture may be more problematic. The average RDM for this pasture did not meet the 1000 lb./ac average RDM in the fall of 1993 (Sellgren, 1994). All other pastures have met this new criteria over the last three years.

Vail & Vickers would incur a loss of commercial hunt revenue due to removal of the deer. Additionally, Vail & Vickers would incur the expense of removing the deer from the island.

NPS Operations

This alternative would significantly alter Park operations, with moderate adverse impact. The Park would lose revenue from the grazing fees for the stock that previously grazed in Old Ranch Pasture. The Park would also bear the costs of any increased monitoring costs (riparian or water quality) and any increase in weed eradication efforts.

Wilderness

Wilderness values will remain unaffected by implementation of this alternative. Santa Rosa Island will remain unsuitable for wilderness designation until sometime after 2011, when grazing has been removed and restoration efforts have been completed.

Summary

Under implementation of the Targeted Management Action alternative, the closure of Old Ranch Pasture to cattle and horse grazing would have substantial, beneficial effects on resources in that pasture, including soils, water quality and riparian areas, vegetation, wildlife, rare species and their habitats, and archeological sites. Water quality, riparian areas, and vegetation would

improve in Old Ranch Pasture, and grazing threats to rare species in that pasture would be eliminated.

The split of North Pasture and the implementation of rotational grazing would have substantial, beneficial effects on water quality and riparian areas in Brockway Pasture, and negligible effects on water quality and riparian areas in Black Mountain Pasture. Rotational grazing would have negligible effects on vegetation in Brockway and Black Mountain Pastures.

Construction of small riparian exclosures (SISTLE's) will have substantial, beneficial effects on resources in the exclosures, including soils, water quality and riparian areas, vegetation, and wildlife. The combination of closing Old Ranch Pasture to cattle grazing, and implementation of cool-season grazing in Brockway Pasture would markedly improve water quality and the condition of riparian areas in those pastures. Construction of SISTLE's in several drainages in Pocket Field, South and Wire Field would slightly or moderately improve water quality in those pastures. Eight of the island's 16 second-order drainages would improve in water quality and riparian condition/function.

Removal of the deer within three years would have substantial beneficial effects on vegetation and rare species and their habitats. Removal of the deer would eliminate browsing pressure on several rare plant species islandwide, and will encourage recovery of shrub, chaparral and woodland communities.

The increase in Residual Dry Matter standards from 400 to 1,000 lb./ac will have moderate, beneficial effects on soils, vegetation, and forage, and slight beneficial effects on wildlife.

Effects on the permittee would be moderately adverse, due to overall loss of grazing capacity, loss of revenue from deer hunting, and costs of removing the deer. Effects on NPS operations would also be moderately adverse.

There would continue to be heavy effects on water quality and riparian areas in some drainages in South and Pocket Field. In pastures other than Old Ranch, there would continue to be heavy effects on soils (in areas where livestock congregate or trail) and on vegetation. There would be moderate effects on weed management, wildlife, and archeological resources.

Under this alternative, there would be slight, beneficial effects on visitor use. There would be no effect on historical resources, unknown effects on cultural landscapes, negligible effects on the regional economic environment, and no effect on wilderness values.

Identified effects would continue until cattle grazing ceases in 2011.

Cumulative Effects

Due to the extensive landscape changes brought about by past and present land use practices, many of the cumulative effects which would be caused by this action are the same as described for the No Action and Minimal Action alternatives. Future cattle grazing under this alternative includes grazing at present stocking rates until 2011, when grazing ceases on the island, with the exception of the immediate closure of Old Ranch Pasture to cattle grazing and the implementation of rotational grazing in a split North Pasture.

On other islands in the Park, past sheep and cattle grazing have led to heavy impacts on soils (Brumbaugh 1980, Johnson 1980). These impacts include intense hillside gully development and loss of soil from wind and water erosion, due to direct and indirect effects of sheep and cattle grazing, as well as loss of microphytic crust. These impacts have largely abated now that sheep and cattle are gone from these islands. Heavy, adverse effects have occurred to soils on Santa Rosa Island as a result of past and current ranching operations. Implementation of the Targeted Management Action alternative may result in greater localized erosion of soils around water sources in Black Mountain Pasture, but this will be offset by reduction of cattle trampling islandwide due to closure of Old Ranch Pasture to cattle and horses, the exclusion of cattle from Brockway Pasture during the warm season, and an increase in Residual Dry Matter standards from 400 to 1,000 lb./ac. These represent moderate beneficial cumulative effects to soils on the northern Channel Islands.

Other past, present and future actions affecting water quality and riparian areas in the Central Coast region include the ongoing impacts of ranching activities throughout the Central Coast Region (this region includes Santa Cruz, Santa Clara, San Benito, Monterey, San Luis Obispo and Santa Barbara counties). The water quality problems identified for Santa Rosa Island (discharge of bacteria and sediment) are common among other rangelands in the Central Coast Region (Michael Thomas, Central Coast Regional Water Quality Control Board, personal communication, April 26, 1996). Although the CCRWQC Board has been working with the USFS to incorporate BMPs for water quality improvement into allotment management plans on the Los Padres National Forest, BMPs are not yet in place for most of these rangelands. As a result, there are ongoing, adverse impacts to water quality and riparian areas in other areas of the Central Coast region. If BMPs are implemented on these rangelands, these adverse impacts may be reduced.

As stated in this draft EIS, past grazing by the current permittee on Santa Rosa Island has rendered many drainages non-functional as riparian areas (Rosenlieb et al. 1995). Under this alternative, the closure of Old Ranch Pasture to cattle, implementation of rotational grazing and the construction of small riparian exclosures will begin to restore riparian function to Santa Rosa Island drainages. Under the Targeted Management Action alternative, water quality on Santa Rosa would improve and there would be a slight positive cumulative effect on water quality in the Central Coast Region.

Other past, present and future actions affecting vegetation, which are detailed in the cumulative effects section of the No Action alternative, mainly result from past ranching activities on other northern Channel Islands and ongoing feral pig and sheep damage on Santa Cruz Island. In general, these actions have caused widespread conversion of native shrublands and perennial grasslands to communities dominated by non-native annual grasses and weeds. Though annual grassland will continue to dominate the island under this Targeted Management Action alternative, the removal of deer would reduce browsing pressure on shrub communities, and chaparral and coastal sage scrub may begin to recover. Additionally, vegetation communities in Old Ranch Pasture would begin to recover. Recovery of chaparral and coastal sage scrub communities on Santa Rosa could add substantially to the extent of those communities on the northern Channel Islands. Chaparral currently occupies about 18,000 acres on Santa Cruz Island, and 2,600 acres on Santa Rosa. Removal of deer would also reduce browsing pressure on Bishop pine woodland, which on the islands, only occurs on Santa Cruz and Santa Rosa Island. Thus,

implementation of this alternative would have substantial beneficial cumulative effects on shrub and woodland communities of the northern Channel Islands.

The status of the island spotted skunk and Santa Cruz gopher snake on Santa Cruz Island is unknown. Although habitat is generally better on Santa Cruz due to increased cover and greater areal extent of shrub communities, current feral pig rooting and sheep grazing on Santa Cruz may decrease or limit available habitat for both island spotted skunk and Santa Cruz gopher snake. The effects of this limitation of habitat for both species, when combined with the limitation of habitat on Santa Rosa, are unknown. Since these two taxa are limited in geographic range to Santa Cruz and Santa Rosa Islands, the status of the skunk and the snake would not change under this alternative. Limitation of habitat will continue on both islands until ungulates are removed and shrub and riparian habitats begin to recover and expand. Implementation of this Targeted Management Action alternative would have slight beneficial effects on these species in Old Ranch Pasture (due to removal of cattle from that pasture) but would have little overall effect on these species.

Heavy, significantly adverse impacts to rare species and their habitats are the result of the combined effects of past and current grazing and browsing by non-native ungulates. These effects are not limited to Santa Rosa Island, but have occurred on all of the northern Channel Islands, and are discussed under the Cumulative Effects section for the No Action alternative. Past and current land use practices on Santa Rosa Island have been identified by U.S. Fish and Wildlife Service as a factor contributing to the rarity and possible extirpation of the 11 Santa Rosa species proposed for listing as endangered. Under the Targeted Management Action alternative, the closure of Old Ranch Pasture to cattle grazing and the removal of deer from the island would result in significant beneficial effects on rare species, thus beginning to reverse the negative cumulative effects of past land use practices. Of the 11 species proposed for listing as Endangered, four occur only on Santa Rosa, and thus the actions proposed under this alternative would benefit each taxon over the entire range of its distribution. Four other species are extant on Santa Rosa and occur or previously occurred on other islands. These taxa would accrue benefits for a portion of their range or former range. The two remaining species are thought to be extirpated on Santa Rosa Island, but are known to occur on other islands. These taxa would also accrue benefits for a portion of their range or former range. The benefits to Santa Rosa species from implementation of this alternative would comprise a significant beneficial effect on rare species on the northern Channel Islands.

Although significant past and present effects on western snowy plover, California brown pelican and peregrine falcon populations on a regional and national level have led to their designation as threatened or endangered, implementation of this Targeted Management Action alternative will result in negligible cumulative effects on these listed species. Recovery of populations of the latter two species in the Southern California Bight will occur regardless of the alternative chosen in this plan. There are now about eight successful breeding pairs of peregrines which nest annually on the northern Channel Islands. Although Channel Islands peregrines still exhibit reproductive and survival problems due to accumulation of organochlorines, USFWS has published a notice of intent to prepare a proposed rule removing peregrines from the list of threatened and endangered species due to overall recovery of the species (Federal Register 60 [126]:34406-409). Cumulative effects on western snowy plover will also be negligible. Although plover nesting habitat in Old Ranch Pasture would be protected by closure of Old Ranch Pasture to cattle grazing, nest failure at Skunk Point may remain high due to high winds

and predation, and the site may not add significantly to plover production over the range of the species.

Moderate, significantly adverse effects on cultural resources have occurred due to effects of past trampling by non-native ungulates. Under this Targeted Management Action alternative, future cattle trampling in all pastures but Old Ranch would exacerbate damage to archeological sites from past and current grazing, and from past rooting by feral pigs. Indirect cumulative effects on archeological sites in all pastures but Old Ranch include further loss of cultural materials from sites due to erosion, which is exacerbated by the effects of ungulates on vegetation. However, these effects would be ameliorated by the increase in vegetation cover due to raising the RDM standards. This would help reduce erosion damage to archeological sites. This would help reduce erosion damage to archeological sites, and would comprise a significant beneficial cumulative effect on cultural resources on the northern Channel Islands.

Under this Targeted Management Action alternative, cumulative effects on the permittee (ranch operations) would be moderately adverse, due to economic impacts such as loss of overall grazing capacity on the island, and costs incurred from removing the deer and reducing the elk.

Mitigation Required

Mitigation would be required to prevent damage to archeological sites from fencing construction for small riparian exclosures and the Smith Highway fence, and for construction of water developments in Black Mountain Pasture.

Construction of fencing for riparian exclosures and the Smith Highway fence may potentially damage the numerous archeological sites on the island and disrupt the historic landscape. However, impact can be reduced by carefully controlling and monitoring this process. No new roads will be constructed in order to place exclosures in drainages. Archeological clearance will be obtained, and the actions will be subject to compliance under Section 106 of the National Historical Preservation Act (NHPA). If archeological sites are unearthed during fence construction, work will be stopped, the Park archeologist will be consulted, and his recommendations will be followed.

Under implementation of rotational grazing, Water Windmill and Cherry Canyons in Black Mountain Pasture would likely experience the brunt of the increased use of riparian areas during the summer months. Under the proposed action twice as many cattle would graze Black Mountain Pasture during the summer drought. Cattle would most likely spend a disproportionate amount of time in riparian areas. To mitigate this eventuality, three water developments would be constructed. The water developments would be placed in locations to encourage cattle to leave riparian areas and take advantage of upland forage. Two SISTLEs would also be constructed to protect small stretches of streams within the pasture. To mitigate possible adverse effects of water development construction on archeological resources, the same procedures will be followed as described above for construction of SISTLE's.

Visitor use and access would need to be controlled while deer and elk removal is occurring. NPS would also need to oversee removal operations to insure no impacts to other resources from vehicles, etc. Therefore, NPS will require the permittee to submit a detailed removal plan, with timetable, subject to NPS approval. NPS staff will be on hand to oversee removal activities.

To avoid impacts to listed and proposed species, the Park would implement any mitigation measures derived through consultation and conferencing with USFWS.

ALTERNATIVE D: REVISED CONSERVATION STRATEGIES (THE PROPOSED ACTION)

Natural Resources

Soils

Implementation of Revised Conservation Strategy will have substantial, beneficial effects on soil resources. Closure of pastures, rapid (in most pastures) reduction of stocking levels, rapid removal of deer, and gradual reduction of elk will result in reduction and eventual elimination of all ungulate impacts to soils, and subsequent stabilization and recovery of those soils. There will thus be decreased trampling of soils islandwide, resulting in increased soil stability, increased water availability for vascular plants, and decreased soil loss; increased nutrient availability to plants; and decreased vegetation loss.

There would still be off-road vehicle travel by ranch vehicles during elk and deer hunts, with resultant compaction of soils. These effects would diminish and eventually halt as deer and elk populations declined, and commercial hunting decreased.

Under this alternative, annual herbicide use would probably increase to two or three times existing levels. However, there would be no effects to soils from this increase in pesticide use. The Park uses Garlon 3A (active ingredient triclopyr) and Roundup (active ingredient glyphosate). In soil and in aquatic environments, triclopyr, a selective, systemic herbicide, rapidly converts to an acid, which in turn is neutralized to a salt (EXTOXNET 1993). Triclopyr is rapidly degraded by soil microorganisms. The half-life in soils is from 30 to 90 days, with an average of about 46 days. Triclopyr is readily translocated throughout a plant after being taken up by either roots or the foliage. The estimated half-life in aboveground drying foliage is two to three months. Breakdown by sunlight is the major means of triclopyr degradation in water; the half-life is 10 hours at 25° C.

Glyphosate, a broad-spectrum, non-selective systemic herbicide, is so highly adsorbed on most soils that little is expected to leach from the application area (EXTOXNET 1994). Microbes are responsible for breakdown of the product, and the half-life in soil ranges from 1-174 days. Photodecomposition plays only a minor role in environmental breakdown. Glyphosate may be extensively metabolized by some plants while remaining intact in others. Once in the plant tissue, the chemical is translocated throughout the plant, including to the roots.

The Park will employ a spot treatment method of pesticide application in order to minimize the amount of herbicide that contacts soil.

Water Quality and Riparian Areas

Under implementation of the Revised Conservation Strategy alternative, protection of riparian areas and improvement in water quality would occur primarily through pasture closures and reduction of stocking levels.

Under implementation of this alternative, several pastures are scheduled to close to grazing within the next four years. As in the Minimal Action and Targeted Management Action alternatives, Old Ranch will be closed to grazing immediately, in 1997. Under the Revised Conservation Strategy, Carrington Pasture will be closed to grazing in 1998, and Pocket Field will be closed to grazing in 2000. As each pasture closes, beneficial effects are the same as described for closed pastures under previous alternatives: recovery of riparian vegetation, stabilization of stream banks, and improvement in water quality. Restoration of riparian areas may be required if native vegetation or seed sources prove inadequate for natural recovery. Fecal inputs from cattle would cease entirely within closed pastures, but some coliform bacteria would likely drift downstream from operating pastures that are upstream. Newly established riparian vegetation would filter out much of the nutrient inputs flowing downstream into the closed pastures. Thus, under this alternative, pasture closures would result in beneficial effects to Quemada Canyon Creek (includes Old Ranch Canyon Creek) and Old Ranch House Canyon Creek and the coastal marsh in 1997, and to Arlington Canyon, Tecolote Canyon, and Garanon Canyon in 2000. Closure of Old Ranch Pasture would eliminate cattle impacts to the marsh and lagoon in that pasture.

The phased reduction of stocking levels will also have beneficial effects on streams in pastures island-wide. Stocking level in Pocket Field will be reduced to 50% of current level in 1998 and 25% in 1999, prior to closure in 2000. Stocking level in North Pasture will be reduced to 75% of current level in 1998, 50% in 1999, and 25% in 2001, prior to closure in 2008. Reduction of pasture stocking level to 25% of current level should have positive, beneficial effects on riparian function and water quality, due to reduced fecal inputs and reduced trampling. These will result in recovery of riparian vegetation, stabilization of stream banks, and improvement in water quality. These positive effects will be seen in Arlington Canyon, Tecolote Canyon, and Garanon Canyon in 1999, and in Windmill Canyon, Cherry Canyon, Water Canyon, Soledad Canyon, Verde Canyon and Lobo Canyon in 1998.

South Pasture would be grazed under a continuous grazing system. However, beginning in 2008, stocking level in South Pasture would decrease, and water quality and riparian function would improve. A riparian exclosure constructed in Jolla Vieja Canyon in 1998 would protect that stream from these continued deleterious effects of cattle grazing. Within that exclosure, fecal inputs will be eliminated, as will cattle trampling of streambanks. This will result in recovery of riparian vegetation, stabilization of stream banks, and improvement in water quality within that exclosure.

Rapid removal of deer would protect the limited riparian woodlands remaining on the island, and would allow restoration of those woodlands. Surface waters island-wide will be improved by rapid phaseout of deer and gradual phaseout of elk, due to decreased trampling of streambanks and less erosion on steep slopes.

Implementation of road management measures will also have beneficial effects on water quality island-wide. Implementation of mitigation measures contained in the water quality certification for maintenance of road stream crossings will eliminate or significantly reduce inputs of sediment from road grading activities into Santa Rosa Island streams, and will ensure that graded roads and stream crossings do not become erosion hazards. Maintenance grading spoils will not be placed in island streams, and measures will be taken to stabilize spoils to abate discharge of sediment to island streams. Culverts and erosion/sediment control measures used at stream crossings will be adequately sized and engineered in order to reduce maintenance requirements and impacts to water quality.

There would be no measurable effects on water quality from herbicide application under this alternative. Herbicide would not be applied near water, and there would be little chance of leaching into groundwater or surface waters. Glyphosate binds tightly to soil particles and would decompose *in situ* within 1-6 months following treatment. Although triclopyr is much more mobile in the soil (it does not adsorb to soil particles), it breaks down more rapidly in soil (approximately 45 days) and very rapidly in water (10 hours). It is practically non-toxic to fish and aquatic invertebrates.

Overall, implementation of the Revised Conservation Strategy alternative would allow for the majority of Santa Rosa Island streams to be completely or significantly protected from the effects of grazing and uncontrolled road management. Implementation of this alternative would also allow for the Park to better manage weed populations which may affect riparian areas. Additionally, the Park will be able to initiate active restoration of riparian woodlands in pastures closed to cattle.

Vegetation

Implementation of the Revised Conservation Strategy will result in substantial, beneficial effects on island vegetation. Rapid removal of deer, and phased removal of elk and cattle will allow natural regeneration of native woodland and shrubland communities and will reduce the dominance of non-native annual grasslands. These vegetation communities contain most of the plant taxa currently proposed for listing as endangered under the Endangered Species Act. The Park has conferred with U.S. Fish and Wildlife Service regarding the likely effects of these proposed actions on these species, and will comply with the recommendations set forth by USFWS in their biological opinion.

Rapid removal of deer will eliminate the primary impactor of native plant communities. Current browsing pressure on native shrubland and woodland communities will be reduced significantly within three years. This will result in substantial beneficial effects on the following vegetation communities: mixed woodland, island oak woodland, ironwood, Bishop pine woodland, coastal sage scrub, and chaparral. Within these communities, new leader growth on individual plants will no longer be browsed off, and seedling establishment and recruitment will occur without predation. Individual plants will no longer be hedged into decumbent forms. Litter will gradually accumulate, and a complex understory may develop.

Phased removal of cattle from the island will have the following effects on vegetation. Within closed pastures (Old Ranch in 1997, Carrington in 1998, Pocket Field in 2000, North in 2008), annual grasses will greatly increase in cover, frequency and density. General ecosystem health

will likely be enhanced in these pastures due to accumulation of ungrazed grasses. The additional inputs of litter to the soil will improve seedling establishment through decreased soil surface temperatures, increased moisture holding capacity, and increased nutrient availability. The increased stubble height of ungrazed grasses will also provide increased protection from wind erosion to the shallow, fragile soils of Pocket Field. There will likely be little or no effect on weeds. Reduction of soil erosion will continue, further enhancing the establishment of native plant species in the uplands. Native habitats, particularly coastal sage scrub, chaparral, coastal bluff scrub, and lupine scrub are expected to expand.

A gradual decrease of elk is prescribed under this alternative because their effects on vegetation are not as acute as effects of the deer. The steady removal of elk over a 14-year period will have moderate beneficial effects on vegetation. The lengthy process of reducing the elk population would slowly relieve some grazing pressure throughout the grasslands and riparian areas. The amount and type of vegetation change which will occur due to this reduction is unknown. However, it is expected that there will be an overall increase in biomass and in cover of grass, shrubs, and trees. Trampling and erosion in woodland communities will decline.

Closure of Old Ranch and Pocket Field pastures to grazing (in 1997 and 2000, respectively) will confer protection on the vegetation in coastal wetlands and vernal pools located in those pastures.

Weeds

Removal of cattle is expected to produce a net, overall reduction in weed populations, with different local results depending on the particular weed, and the site.

Weeds that flourish in the heavily disturbed areas along streams, in bedding/resting areas, at feeding areas (for example, milk thistle, bull thistle, spiny clotbur, cheeseweed) are expected to gradually decrease their dominance of these areas, as grasses and other previously-grazed plants begin to cover these sites, and as litter accumulates on the soil surfaces.

Since the cattle are not feeding on these plants now, the animals' removal will not greatly affect current distributions or numbers of these species. Therefore, there will be similar patterns for the first few years in the absence of the animals, given that there are already large quantities of seed in the soil at these sites.

As the years progress, and vegetation and litter cover build up, there will be gradual decreases in population numbers and vigor of weedy species that prefer disturbed areas, though distributions will remain about the same. During this time, NPS will make every effort to preclude seed production by appropriate selective herbicide applications and/or timely mowing of stands. Though the life expectancy of seed in the soil seedbank can be lengthy (estimated 6-10 years for milk thistle and bull thistle, and perhaps somewhat longer for clotbur and cheeseweed), it is anticipated that enough other vegetation and litter will build up in the first few years without grazing-related disturbance to prevent seeds of these weeds from successfully establishing, or ever germinating. Eventually, the seedbank at that site will be greatly depleted or exhausted of seed of these species.

In areas where disturbance is due to larger forces (e.g. floodplains of streams, or geologically unstable areas), these plants will still find opportunities to persist and even thrive. In the case of areas subject to seasonal flood disturbance, the Park will continue to concentrate annual control efforts on prevention of seed production, and work in the longer term on stabilization of streamcourses and watersheds with recovering native vegetation so that these flood events will be less extensive and less frequent. Observation over time will determine which areas are truly geologically unstable, and which are temporarily de-stabilized due to depletion of native vegetation. As in the seasonally flooded areas, the Park will continue to concentrate on suppression of seed production, while allowing or assisting the recovery of native vegetation on these areas.

Weeds that initially become established in disturbed areas, but whose established stands usually persist and slowly expand with little or no continuing disturbance, such as fennel, horehound, perennial mustard, curly dock, and smilo grass, will need to be directly controlled, most often by spot applications of the appropriate herbicide to individual plants. These plants generally, and especially in the earlier phases of establishment that they display on Santa Rosa Island, are distributed patchily, and usually at low densities. This type of distribution, particularly if the seeds are not windborne, requires the thorough inspection and treatment that can best be accomplished on foot with backpack herbicide applicators. Each successive year of treatment will reduce the soil seed bank of weed seeds. Since, simultaneously, overall vegetation cover and density are increasing island-wide, there will be decreasing opportunities for the remaining weed seeds to germinate.

Weeds that are "co-dominants" or "sub-dominants" in alien annual grasslands in heavily grazed sites and/or sites of low soil-nutrient status, such as sweet-clover and Napa thistle, are expected to probably increase in both cover and total biomass in the first few years without grazing, as will the alien annual grasses that dominate these sites (for example, much of the thin caliche-underlain areas of Pocket Field Pasture, and much of the hot, dry, thin and rocky soils of the south-facing lower slopes of South Pasture). It is expected that both types of plants (forbs and grasses) would increase in proportion to the typical relative dominance of a particular site that they displayed while the sites were grazed.

However, after a few years of thatch build-up, seedlings of both types would be suppressed, but the forb seedlings would be suppressed more, due to their typically higher light requirements. Thus dominance of the site would be shifted away from the weedy forbs toward the alien annual grasses (typically bromes) that presently dominate these low-nutrient sites.

In the longer term, this situation is invisable by seedlings of the plant communities formerly dominant on these sites: Coastal Bluff Scrub and/or Coastal Sage Scrub in Pocket Field Pasture, and Coastal Bluff Scrub in South Pasture. As on San Miguel Island and on Santa Barbara Island, seedlings of certain members of these communities can successfully compete with the alien annual grasses typical of these sites (predominantly the smaller, less vigorous bromes).

Forage Production and Availability

Under the Revised Conservation Strategy alternative there would be moderate changes in forage production and availability. These changes can be classified into two categories: pasture closures and reduction of stocking levels.

This alternative calls for a series of pasture closures. Effects on forage production and availability due to the immediate closure of Old Ranch Pasture and in other closed pastures would be as described under previous alternatives, characterized by an increase in forage, but available only to elk. Reduction of stocking levels in North Pasture and in Pocket Field would result in increased availability of forage for the cattle remaining in the pasture. This would be a substantial, beneficial effect on forage.

Wildlife

Implementation of the Revised Conservation Strategy will have, overall, significantly beneficial effects on wildlife.

Effects on wildlife from the closure of Old Ranch Pasture and the removal of deer are identical to the effects described for Alternative C. Gradual removal of elk would have moderate beneficial effects on wildlife, in that elk removal would allow for commensurate recovery of native vegetation, which comprises habitat for native wildlife.

Carrington Pasture will be closed in 1998, Pocket Field in 2000, and North in 2008. The closing of these pastures will have direct and positive effects on wildlife. The small mammals which utilize these pastures would benefit from an increase in cover, seeds and other plant materials as the vegetation slowly recovers. The invertebrate populations within the pastures and riparian areas should increase, which would then increase the food base for fox, skunk, mice, and lizards. Lizards would also benefit from an increase in cover. Passerine birds would benefit from an increase in nesting and roosting habitat as well as an increase in the understory and seed plants. Predators, including the gopher snake and raptors, would benefit from the increase in mice, lizards and passerine bird populations.

Reduction in stocking levels in Pocket Field and North Pastures would have moderately beneficial effects on wildlife, similar in direction of change to effects anticipated from pasture closures, but short-term. Once these pastures are closed, the long-term effects on wildlife would be as described above.

The increase in RDM standards would have slight indirect benefits for wildlife, as described under Targeted Management Action, through habitat improvement. An increase in minimum RDM from 400 to 1,000 lb./ac may be accompanied by an increase in cover and seed grasses and an increase in invertebrates, which would increase the food base for fox, skunk, and mice. Birds would benefit from an increase in seed plants. Lizards would benefit from an increase in cover as well as from an increase in invertebrate/prey populations. Predators, including the gopher snake and birds of prey, would benefit from the increase in mouse and lizard populations.

There would be no significant effects to wildlife from herbicide use proposed under this alternative. The method of application (spot treatment of individual plants) minimizes the amount of herbicide used and that wildlife might contact or ingest. Triclopyr has low chronic toxicity to mammals and is not expected to concentrate to any significant degree in animal tissue (EXTOXNET 1993). Triclopyr is slightly toxic to water fowl and practically non-toxic to fish and aquatic invertebrates. Glyphosate is only slightly toxic to wild birds, and is practically nontoxic to fish (EXTOXNET 1994). There is very low potential for the chemical to accumulate

in the tissues of aquatic invertebrates or other aquatic organisms. In mammals, glyphosate is poorly absorbed from the digestive tract and is largely excreted unchanged; it has no significant potential to accumulate in animal tissue.

Rare Species and Their Habitats

Implementation of Alternative D, Revised Conservation Strategy, would have substantial, beneficial effects on rare species, including the following species which have been proposed for listing as endangered by the USFWS. The following section refers to both a *conference opinion* issued in April, 1997 by USFWS regarding possible effects of this plan on plant species proposed for listing as endangered, and a *biological opinion* issued by USFWS in 1995 regarding the effect of Park activities on two listed species, western snowy plover and brown pelican.

Hoffman's rock cress (*Arabis hoffmannii*)

Arabis hoffmannii has been impacted by historic and current activities of ungulates, including sheep, cattle, deer and elk. Under this alternative, *Arabis hoffmannii* will benefit from removal of deer and reduction of elk and cattle. *A. hoffmannii* occurs in low population numbers in steep, inaccessible habitat. The remnant habitat has poor soils and high erosion. Additionally, the small populations are isolated and fragmented. Coastal bluff and coastal sage scrub, the habitats for *A. hoffmannii*, will likely increase in extent and native species diversity following reduction of ungulates, since those habitats are currently restricted in distribution by ungulate browsing and grazing. This will provide better conditions to support the expansion of *A. hoffmannii* to more favorable sites. As per recommendations from USFWS' conference opinion, mitigation measures for this species will include erosion control in *Arabis* habitat and seed banking.

Santa Rosa Island manzanita (*Arctostaphylos confertiflora*)

Arctostaphylos confertiflora has been highly impacted over time by deer and elk browsing, by trampling/bedding by deer, elk, and cattle, and by soil erosion due to both historic and recent grazing practices. The few individuals of *A. confertiflora* remaining on Santa Rosa Island are relegated to fairly steep terrain. This species occurs in woodland and shrubland habitats which are highly degraded and no longer support natural nutrient cycling or fire regimes. Reduction in livestock numbers will remove the direct impacts of browsing and trampling. It may be possible for new individuals of *A. confertiflora* to recruit into the population. Over time, natural restoration in the woody communities will result in increases in native species, decreases in non-native species, increased ground cover, and expansion of community boundaries. Fire, a natural process in chaparral and Bishop pine communities, will be better able to assume its natural role. Implementation of this alternative would have significant, beneficial effects on *Arctostaphylos confertiflora*. As per recommendations from USFWS' conference opinion, mitigation measures for this species will include erosion control in *Arctostaphylos* habitat, monitoring of browse impacts to *Arctostaphylos*, and seed banking.

Soft-leaved paintbrush (*Castilleja mollis*)

Castilleja mollis has been impacted over time by historic and recent grazing practices, and will thus benefit from reductions in deer and elk populations and from the closure of Carrington Pasture and Pocket Field to livestock grazing. Deer, elk, and cattle are known to trample the habitat and break stems of *Castilleja mollis* (McEachern et al. 1997). The species is a hemiparasite, and its primary associates (*Isocoma menziesii*, *Erigeron galucus*, *Distichlis spicata*, *Atriplex californica*, and *Astragalus miguelensis*) are also affected by livestock grazing and trampling. Closure of Carrington and Pocket Field pastures will benefit populations of host plants, as well. Non-native plant species, especially iceplant, occur in association with *C. mollis*, and may compete for suitable habitat. Control of iceplant will require direct action by the NPS, and is a mitigation action. As per recommendations from USFWS' conference opinion, mitigation measures for this species will include weed control in *Castilleja* habitat and seed banking.

The scheduled reduction of elk is less rapid than the recommendation of the Conservation Strategy Team. This is because the combined effects of the removal of deer and reduction of elk numbers should reduce impacts on native habitats and species to an acceptable level, such that the elk reduction schedule can be maintained. However, if monitoring shows that elk impacts continue to be significant on rare species and habitats, their removal will need to be accelerated. Reduction of elk should result in commensurate reductions of elk impacts to *Castilleja mollis*. Monitoring of stem breakage in *Castilleja* populations will therefore be continued as a mitigation measure. If monitoring shows that the predicted decline in stem breakage is not occurring, or not occurring commensurate with elk reduction, then elk populations will be reduced at a faster rate until the level of damage is sufficiently low.

Santa Rosa Island live-forever (*Dudleya blochmaniae* ssp. *insularis*)

Dudleya blochmaniae ssp. *insularis* has been impacted over time by historic and recent grazing practices, by non-native plant species, cattle trampling, and occasional vehicle traffic. The immediate closure of Old Ranch Pasture to livestock will remove impacts from trampling and soil loss. Habitat restoration in the pasture may lessen the impact of non-native plants in the *Dudleya* habitat; however, direct control of non-native species in the *Dudleya* habitat will be needed. As per recommendations from USFWS' conference opinion, mitigation measures for this species will include seed banking.

Dwarf Greene's live-forever (*Dudleya greenii* forma *nova*)

Effects on *Dudleya greenii* forma *nova* from implementation of this alternative will be negligible. The known population in Old Ranch Pasture is presently protected from cattle grazing by a fenced enclosure. Closure of that pasture to cattle and horse grazing will have no additional effect on the species, which has been impacted by historic and recent grazing practices. As per recommendations from USFWS' conference opinion, mitigation measures for this species will include seed banking.

Hoffman's gilia (*Gilia tenuiflora* ssp. *hoffmannii*)

Gilia tenuiflora ssp. *hoffmannii* has been impacted over time by historic and recent grazing practices, including soil loss, habitat alteration, cattle grazing, and deer trampling. An unpaved road runs through the population near East Point. A "two track" road runs through the

population above Skunk Point. Part of the population near East Point has been fenced to exclude cattle. Old Ranch Pasture contains 100% of the known occurrences of *Gilia tenuiflora* ssp. *hoffmannii* on Santa Rosa. The immediate closure of Old Ranch Pasture to livestock will remove impacts from trampling and soil loss, resulting in significant beneficial effects on *Gilia*. The *Gilia* is surrounded by non-native annual grasslands. Removal of livestock from Old Ranch will allow the NPS to test methods for restoration of dune and coastal bluff scrub communities; actions which will be important for the protection and maintenance of *Gilia*. As per recommendations from USFWS' conference opinion, mitigation measures for this species will include seed banking.

Island alum-root (*Heuchera maxima*)

Heuchera maxima occurs in low population numbers in steep, inaccessible habitat, due to historic and recent grazing practices. The remnant habitat has poor soils and high erosion. Additionally, the small populations are isolated and fragmented. Coastal bluff and mixed woodlands, the habitats for *H. maxima*, will likely increase in extent and native species diversity following reduction of ungulates. This will provide better conditions to support the expansion of *H. maxima* to more favorable sites. As per recommendations from USFWS' conference opinion, mitigation measures for this species will include seed banking.

Island malacothrix (*Malacothrix indecora*)

Malacothrix indecora, a component of the coastal bluff community, occurs in very low numbers in two populations in North Pasture. These areas comprise degraded coastal bluff habitat that is accessible to livestock. *Malacothrix* will benefit from reductions in stocking level in North Pasture, which will result in increased vegetative cover by native plants and decreases in non-native grasses in the coastal bluff community. Thus, *Malacothrix* habitat will be improved. Additionally, reduction in stocking level will minimize the threat of trampling or predation by cattle. As per recommendations from USFWS' conference opinion, mitigation measures for this species will include weed control and erosion control in *Malacothrix* habitat, seed banking, and monitoring to track possible grazing impacts to *Malacothrix*. If such impacts are detected, *Malacothrix* populations will be fenced to exclude cattle and horses.

Northern Channel Islands phacelia (*Phacelia insularis* var. *insularis*)

Phacelia insularis var. *insularis*, which has been impacted over time by historic and recent grazing practices, will benefit from closure of Carrington Pasture to livestock. *P. insularis* currently occurs in very low numbers in degraded lupine scrub and coastal bluff habitat. High density of non-native grasses remove suitable habitat for the species. Restoration of *P. insularis* will be dependent on direct management actions to restore its habitat. Thus, mitigation will include the use of mowing to reduce alien grasses and restore native plant communities.

Phacelia occurred historically in the dune habitat behind Skunk Point (same habitat as occupied by *G. tenuiflora* ssp. *hoffmannii*). It is no longer known from this area. The historical habitat has been degraded over time by livestock trampling, grazing, and browsing. Removal of cattle and horses from Old Ranch will allow the NPS to test methods (such as prescribed fire) for restoration of the dune, and improvement of potential *Phacelia* habitat. This is a substantial, beneficial effect

on the species. As per recommendations from USFWS' conference opinion, mitigation measures for this species will include weed control in *Phacelia* habitat and seed banking.

Herbicide Use

Herbicide use proposed under this alternative would have no effect on listed or proposed species, except in the sense that eradication of alien species eliminates potential competitors of rare and other native plant species. Individual plants would not be affected; the spot method of herbicide application minimizes effects on non-target species. Herbicides would not be applied near populations or individuals of endangered or threatened species, or species proposed for listing.

Western snowy plover

Effects on western snowy plover from Alternative D are identical to the effects described for Alternatives B and C.

NPS has completed conferencing with USFWS regarding possible effects of the proposed actions on species proposed for listing as endangered under the Endangered Species Act. NPS developed a biological assessment evaluating the effects of these actions on proposed species, and concluded that implementation of the proposed actions contained in this plan would not result in jeopardy for any proposed species. In a subsequent biological opinion, USFWS concurred with NPS' assessment. The Park will comply with the recommendations set forth by USFWS in the biological opinion, and those actions have been incorporated as mitigation measures into this plan.

Cultural Resources

Archeological Resources

As described under the Targeted Management Action alternative, closure of Old Ranch Pasture to cattle would have beneficial effects on archeological resources in that pasture. The exclusion of cattle would eliminate cattle impact to the archeological sites in this area, which could include the remains of the first island ranch structures. There would be similar beneficial effects on archeological resources in other closed pastures (Carrington in 1998, Pocket Field in 2000, North in 2008).

Prior to construction of fencing for riparian enclosures in Jolla Vieja Canyon (South Pasture) and at Box Springs (Wire Field Pasture), the Park will conduct an archeological survey to ensure no damage to archeological sites. The proposed fenceline would be re-routed, as necessary. The Park will obtain an archeological clearance, and the actions will be subject to compliance with Section 106 of the National Historical Preservation Act (NHPA). If archeological sites are unearthed during fence construction, work will be stopped, the Park archeologist will be consulted, and his recommendations will be followed.

A decrease in the elk population would decrease the minimal impact of elk on archeological sites. Vehicular traffic associated with the elk hunt would continue to offer the potential to impact archeological sites, but this would decrease significantly as elk were gradually removed from the island.

Historical Resources

This alternative would have no effect upon historical structures or their surrounding historic landscape preservation area, since fencing and water developments would not be constructed near historic structures. Implementation of this alternative does not affect NPS plans for a demonstration ranch at Beecher's Bay, as per the Park's general management plan (NPS 1985).

Cultural Landscape

Within Old Ranch Pasture and other closed pastures, the removal of cattle would replace the current cultural landscape with a landscape more nearly resembling the prehistoric cultural landscape. A cultural landscape study has not been completed, but it is unlikely that this would negatively affect potential cultural landscapes. Implementation of this alternative would not affect Park plans to preserve the cultural landscape of the ranch at Beecher's Bay via an 800 acre demonstration ranch. The remainder of the cultural landscape would be substantially unaffected.

Ethnography

Removal of cattle from the Old Ranch pasture would have slight, beneficial effects on ethnographic resources. Exclusion of cattle from Old Ranch would return a more traditional appearance to a portion of the island. Reduction of erosion should reduce the rate at which burials are exposed. Historic Chumash villages in the Old Ranch pasture would be less impacted by erosion.

Socioeconomic Resources

Regional Economic Environment

Under this alternative, the current cattle grazing operation would be reduced to approximately 50% of its current level within four years, and would remain at that level until further reductions begin in 2008 and operations cease in 2011. The exact effects of this on the regional economic environment are unknown, but given that this alternative affects only one ranch in the Central Coast area, the effects are likely to be negligible.

Visitor Use

Under implementation of the Revised Conservation Strategy alternative, there would be positive effects on visitor use and the visitor experience. Visitor activities currently stress low-impact, low-volume activities, but visitors are currently not allowed access to most of the island unless escorted by a Ranger. Under this alternative, however, visitor access on Santa Rosa Island will be increased. The requirement for Ranger escort would be eliminated. In addition, visitors may enjoy their visit more when recovery of the riparian area and uplands occurs in closed pastures.

Removal of deer and reduction of elk may have both positive and negative effects on the visitor experience. On the one hand, removal of the deer will allow eventual recovery of chaparral and coastal sage scrub communities, and visitors may find their island experience more pleasurable

because of this. On the other hand, some visitors may find their island experience less pleasing if the deer are not present.

Raising the minimum RDM level from 400 to 1000 pounds per acre may protect upland areas more, and no pastures would appear overgrazed. In the short term, some riparian areas will be heavily utilized, and ongoing aesthetic impacts similar to those described for Alternative A would continue. In the long term, as grazing is reduced and more pastures are closed, riparian areas would improve. This improvement would be a beneficial impact on the visitor experience.

Grazing/hunting Permittee

Implementation of this alternative would have varying degrees of adverse effects on the permittee over time. The current operations of the permittee would be markedly affected in the short term, and there would be additional impacts over the long-term as grazing is reduced further. Each reduction in AUM's would likely result in commensurate reduction of ranch profits. See Table 9 and Figure 5 for the schedule of stocking level reduction. At some point in this process that ranch could lose economic viability. When the ranch would meet that point is not known.

The closure of Carrington Pasture in the year in 1998 would force a change in ranch operations. Currently Carrington Pasture is used for long term management of weak or sick animals. Acute care currently occurs in the Hospital Field near the ranch. Loss of Carrington Pasture would likely force the ranch to either set aside other areas on the island for long term management of weakened animals or to ship these animals off the island at a loss.

Vail & Vickers could eventually incur a loss of commercial hunt revenue after 2002 due to removal of the deer, and possibly the expense of removing the deer from the island. Reduction of the elk herd could also cause a loss of revenue to the permittee. Alternately, these costs could be offset by income from sales or commercial hunts, if those are part of the removal program.

Vail & Vickers would also have to bear the cost of fence construction, for the exclosures in Jolla Vieja Canyon and at Box Springs, and for fence maintenance for the existing Lobo Canyon exclosure and the island oak exclosure at Soledad Peak.

NPS Operations

Implementation of the Revised Conservation Strategy alternative would have moderate, positive impacts on NPS operations. The Park would no longer bear the costs of escorting visitors on the island. There would be a phased loss of revenue to the Park from the grazing fees for the stock that previously grazed in pastures that are closed. The Park would also bear the costs of any increased monitoring (riparian or water quality), any increase in weed eradication efforts, and any restoration actions, such as prescribed burns and propagation/outplanting of native plant materials. These costs, however, are likely less than the eventual costs to NPS of island restoration if the ranch and hunt operations were to continue unchanged until 2011.

Wilderness

Wilderness values would be slightly improved by implementation of the Revised Conservation Strategy, in that wilderness suitability will be improved in closed pastures, as recovery occurs.

Summary

Under implementation of the Revised Conservation Strategy alternative, the phased reduction of livestock grazing would have substantial, beneficial effects on resources, including soils, water quality and riparian areas, vegetation, wildlife, rare species and their habitats, and archeological sites. Water quality, riparian areas, and vegetation would improve immediately in closed pastures and pastures with reduction in stocking levels. Grazing threats to rare species would be eliminated. With the exception of Jolla Vieja Canyon (which would be protected by a small riparian enclosure), there would be no change in water quality and riparian areas in some drainages in South Pasture, until stocking level is reduced (2008-2011).

Removal of deer within three years will have substantial beneficial effects on vegetation and rare species and their habitats. Removal of the deer will eliminate browsing pressure on several rare plant species islandwide, and will encourage recovery of shrub, chaparral and woodland communities.

Phased removal of the elk will have moderate, beneficial effects on vegetation, and will have substantial benefits to two proposed plant species.

The increase in Residual Dry Matter standards from 400 to 1,000 lb./ac will have moderate, beneficial effects on soils, vegetation, and forage, and slight beneficial effects on wildlife.

Effects on the permittee would be adverse, due to overall loss of grazing capacity, loss of revenue from elk and deer hunting, and costs of removing the deer and elk. Effects on NPS operations would be moderate and positive.

Implementation of mitigation measures identified through Section 7 conferencing with USFWS will prevent impacts to rare species.

Under this alternative, there would be beneficial effects on visitor use. There would be no effect on historical resources, unknown effects on cultural landscapes, negligible effects on the regional economic environment, and minimal effect on wilderness values.

Cumulative Effects

Due to the extensive landscape changes brought about by the combined effects of past and present land use practices, many of the cumulative effects which would be caused by this action are the same as described for the No Action, Minimal Action and Targeted Management Action alternatives. Future cattle grazing under this alternative includes phased removal of grazing according to the prescribed schedule.

On other islands in the Park, past sheep and cattle grazing have led to heavy impacts on soils (Brumbaugh 1980, Johnson 1980). These impacts include intense hillside gully development and loss of soil from wind and water erosion, due to direct and indirect effects of sheep and cattle grazing, as well as loss of microphytic crust. These impacts have largely abated now that sheep and cattle are gone from these islands. Many years of ranching activities have caused heavy, adverse effects on soils on Santa Rosa Island. Implementation of the Revised Conservation Strategy alternative will result in reduction of cattle trampling islandwide due to phased closure of pastures, reduction of stocking levels, and an increase in Residual Dry Matter standards from 400 to 1,000 lb./ac. These represent substantial beneficial cumulative effects to soils on the northern Channel Islands.

Other past, present and future actions affecting water quality and riparian areas in the Central Coast region include the ongoing impacts of ranching activities throughout the Central Coast Region (this region includes Santa Cruz, Santa Clara, San Benito, Monterey, San Luis Obispo and Santa Barbara counties). The water quality problems identified for Santa Rosa Island (discharge of bacteria and sediment) are common among other rangelands in the Central Coast Region (Michael Thomas, Central Coast Regional Water Quality Control Board, personal communication, April 26, 1996). Although the CCRWQC Board has been working with the USFS to incorporate BMPs for water quality improvement into allotment management plans on the Los Padres National Forest, BMPs are not yet in place for most of these rangelands. As a result, there are ongoing, adverse impacts to water quality and riparian areas in other areas of the Central Coast region.

As stated in this plan, years of livestock grazing on Santa Rosa Island has rendered some drainages non-functional as riparian areas (Rosenlieb et al. 1995). Under this alternative, the phased closure of pastures and reduction in stocking would begin to restore riparian function to Santa Rosa Island drainages. Under these proposed actions, water quality on Santa Rosa would also improve. Implementation of this alternative would result in a slight positive cumulative effect on water quality and riparian habitat in the Central Coast Region.

Other past, present and future actions affecting vegetation, which are detailed in the cumulative effects section of the No Action alternative, mainly result from past ranching activities on other northern Channel Islands and ongoing feral pig and sheep damage on Santa Cruz Island. In general, these actions have caused widespread conversion of native shrublands and perennial grasslands to communities dominated by non-native annual grasses and weeds. Though annual grassland will continue to dominate the island in the near future under this alternative, the removal of deer will reduce browsing pressure on shrub communities, and chaparral and coastal sage scrub will begin to recover. Additionally, vegetation communities in Old Ranch Pasture will begin to recover. Recovery of chaparral and coastal sage scrub communities on Santa Rosa could add substantially to the extent of those communities on the northern Channel Islands. Chaparral currently occupies about 18,000 acres on Santa Cruz Island, and 2,600 acres on Santa Rosa. Removal of deer will also reduce browsing pressure on Bishop pine woodland, which on the islands only occurs on Santa Cruz and Santa Rosa Island. Thus, implementation of this alternative will have substantial beneficial cumulative effects on shrub and woodland communities of the northern Channel Islands.

The status of the island spotted skunk and Santa Cruz gopher snake on Santa Cruz Island is unknown. Although habitat is generally better on Santa Cruz due to increased cover and greater

areal extent of shrub communities, current feral pig rooting and sheep grazing on Santa Cruz may decrease or limit available habitat for both island spotted skunk and Santa Cruz gopher snake. The effects of this limitation of habitat for both species are unknown. These two taxa are limited in geographic range to Santa Cruz and Santa Rosa Islands. The status of both the skunk and the snake may improve under this alternative when shrub and riparian habitats begin to recover and expand. Implementation of this alternative would have moderate beneficial effects on these species on Santa Rosa Island and moderate overall beneficial effects on these species.

Heavy, significantly adverse impacts to rare species and their habitats are the result of the combined effects of many years of grazing and browsing by non-native ungulates. These effects are not limited to Santa Rosa Island, but have occurred on all of the northern Channel Islands, and are discussed under the Cumulative Effects section for the No Action alternative. The many years of ranching activities on Santa Rosa Island have been identified by U.S. Fish and Wildlife Service as a factor contributing to the rarity of the 11 Santa Rosa plant species proposed for listing as endangered. Under the Revised Conservation Strategy alternative, the phased pasture closures and reduction of stocking level, the removal of deer from the island, and the reduction of elk would result in significant beneficial effects on rare species, thus beginning to reverse the negative cumulative effects of past land use practices. Of the 11 species proposed for listing as Endangered, four occur only on Santa Rosa, and thus the actions proposed under this alternative would benefit each of those taxa over the entire range of its distribution. Four other species are extant on Santa Rosa and occur or previously occurred on other islands. These taxa would accrue benefits for a portion of their range or former range. The two remaining species are thought to be extirpated on Santa Rosa Island, but are known to occur on other islands. These taxa would also accrue benefits for a portion of their range or former range. The benefits to Santa Rosa species from implementation of this alternative would comprise a significant beneficial effect on rare species on the northern Channel Islands.

Although significant past and present effects on western snowy plover, California brown pelican and peregrine falcon populations on a regional and national level have led to their designation as threatened or endangered, implementation of this alternative will only result in negligible cumulative effects on these listed species. Recovery of populations of the latter two species in the Southern California Bight will occur regardless of the alternative chosen in this plan. There are now about eight successful breeding pairs of peregrines which nest annually on the northern Channel Islands. Although Channel Islands peregrines still exhibit reproductive and survival problems due to accumulation of organochlorines, USFWS has published a notice of intent to prepare a proposed rule removing peregrines from the list of threatened and endangered species due to overall recovery of the species (Federal Register 60 [126]:34406-409). Cumulative effects on western snowy plover will also be negligible. Although plover nesting habitat in Old Ranch Pasture will be protected by closure of Old Ranch Pasture to cattle grazing, nest failure at Skunk Point may remain high due to high winds and predation, and the site may not add significantly to plover production over the range of the species.

Moderate, significantly adverse effects on cultural resources have occurred due to the effects of past trampling by non-native ungulates. Under this alternative, future cattle trampling will be reduced by phased closure of pastures and phased removal of grazing, and by the increase in vegetation cover due to raising the RDM standards. This would help reduce erosion damage to archeological sites, and would comprise a significant beneficial cumulative effect on cultural resources on the northern Channel Islands.

Under this Revised Conservation Strategy alternative, cumulative effects on the permittee (ranch operations) could be heavy and adverse, due to economic impacts such as loss of overall grazing capacity on the island, and the possible costs incurred from removing the deer and reducing the elk.

Mitigation Required

Mitigation would be required to prevent damage to archeological sites from fence construction for exclosures in Jolla Vieja Canyon and at Box Springs. Archeological clearance will be obtained, and the actions will be subject to compliance with Section 106 of the National Historical Preservation Act (NHPA). If archeological sites are unearthed during fence construction, work will be stopped, the Park archeologist will be consulted, and his recommendations will be followed.

For safety reasons, visitor use and access would need to be controlled while deer and elk removal is occurring. NPS would also need to oversee removal operations to minimize impacts to other resources from vehicles, etc. Therefore, NPS will require the permittee to submit a detailed removal plan, with timetable, subject to NPS approval. NPS staff will be on hand to oversee removal activities.

As per the recommendations included in the biological opinion from USFWS regarding these proposed actions, NPS will undertake the following mitigation actions for species proposed for listing as endangered under the Endangered Species Act:

- Alien plant control in *Castilleja*, *Phacelia* and *Arabis* habitat
- Erosion control in *Arabis*, *Arctostaphylos* and *Malacothrix* habitat
- Monitoring of *Malacothrix* populations; construction of cattle exclosures if cattle impacts are detected
- Monitoring of *Arctostaphylos* populations for browse damage, to quantify the effects of deer removal
- Monitoring of stem breakage in *Castilleja*, and acceleration of elk reduction schedule if unacceptable levels of stem breakage continue
- Use of methods such as mowing and prescribed fire to improve habitat for *Phacelia* and *Gilia*
- Establishment of a seed banking program for rare species
- Submission of an annual report to USFWS on the above, along with a report on cattle utilization by pasture

The Park will develop and implement a comprehensive weed management program to mitigate problems caused by alien plant species.

ALTERNATIVE E: IMMEDIATE REMOVAL OF UNGULATES

Alternative E, Immediate Removal of Ungulates, would require the permittee to remove all livestock, including cattle, horses, deer, and elk, from Santa Rosa Island within three years. The weed management program would be increased as funding allows.

Natural Resources

Soils

Implementation of Immediate Removal of Ungulates will have substantial, beneficial effects on soil resources. After all ungulates are removed from the island (within three years of implementation), impacts to soils will be eliminated, and stabilization and recovery of those soils should subsequently occur. There will thus be decreased trampling of soils islandwide, resulting in increased soil stability, increased water availability for vascular plants, and decreased soil loss; increased nutrient availability to plants; and decreased vegetation loss.

There would still be off-road vehicle travel by ranch vehicles during elk and deer hunts, with resultant compaction of soils. These effects would diminish and eventually halt as deer and elk populations declined, and commercial hunting decreased.

There would be no effects to soils from pesticide use proposed under this alternative. Pesticide use would probably remain at or slightly above existing levels (Table 17). The Park uses Garlon 3A (active ingredient triclopyr) and Roundup (active ingredient glyphosate). In soil and in aquatic environments, triclopyr, a selective, systemic herbicide, rapidly converts to an acid, which in turn is neutralized to a salt (EXTOXNET 1993). Triclopyr is rapidly degraded by soil microorganisms. The half-life in soils is from 30 to 90 days, with an average of about 46 days. Triclopyr is readily translocated throughout a plant after being taken up by either roots or the foliage. The estimated half-life in aboveground drying foliage is two to three months. Breakdown by sunlight is the major means of triclopyr degradation in water; the half-life is 10 hours at 25° C.

Glyphosate, a broad-spectrum, non-selective systemic herbicide, is so highly adsorbed on most soils that little is expected to leach from the application area (EXTOXNET 1994). Microbes are responsible for breakdown of the product, and the half-life in soil ranges from 1-174 days. Photodecomposition plays only a minor role in environmental breakdown. Glyphosate may be extensively metabolized by some plants while remaining intact in others. Once in the plant tissue, the chemical is translocated throughout the plant, including to the roots.

The spot treatment method of application minimizes the amount of herbicide that contacts soil.

Water Quality and Riparian Areas

Complete and immediate removal of all non-native ungulates within three years would have substantial, beneficial impacts to the streams, riparian areas, and water quality of the island. Riparian vegetation would likely grow rapidly if appropriate vegetation and/or seed sources are available. However, most riparian areas on the island are devoid of native riparian plants. In these areas, restoration efforts would likely be required. Whether recovery occurs naturally or with the assistance of restoration, vegetative cover along stream banks would likely increase. This in turn would facilitate stabilization of stream banks. As riparian cover increases, sediments would likely be trapped by the vegetation, forming new stream banks and point bars. This in turn would likely provide new riparian habitat. As the process continues, stream width would likely

decrease, while stream column depth would increase. The result would be narrower and deeper streams.

The improvements in riparian habitat and channel morphology would lead to improvements in water quality. With a narrower and deeper stream column, water temperatures would decrease. Establishment of shrubby and woody riparian vegetation would contribute to this process by providing shade for the stream waters. Suspended sediment levels during storm events would not rise as high within excluded areas. Fecal and urine inputs from cattle would cease entirely, once cattle were completely removed. Amounts of *Cladophora* algae would likely diminish within a few years. Water quality would improve and riparian areas would recover at faster rates and over a wider area than under the other alternatives.

There would be no effects on water quality from herbicide application under this alternative. Herbicide would not be applied near water, and therefore would be little chance of leaching into groundwater or surface waters. Glyphosate binds tightly to soil particles and would decompose *in situ* within 1-6 months following treatment. Although triclopyr is much more mobile in the soil (it does not adsorb to soil particles), it breaks down more rapidly in soil (approximately 45 days) and very rapidly in water (10 hours). It is practically non-toxic to fish and aquatic invertebrates.

Vegetation

Implementation of this alternative would result in substantial, beneficial effects to vegetation. The direct effects of this alternative would be to remove all grazing, browsing, and trampling impacts from all vegetation. Plants would no longer be harmed or destroyed by being wholly or partially eaten, nor would they be broken or uprooted by being walked on, lain upon, or rubbed against. Reproductive cycles would no longer be interrupted by consumption or breakage of flowering/fruitlet structures.

In response to removal of these direct effects, the majority of the vegetation will show an increase in plant size, plant density, and population area.

Annual plants may show rapid recovery. This includes the proposed species *Gilia tenuiflora hoffmannii* and *Phacelia insularis insularis*. Recovery will be directly related to the size of the seedbank and the amount of precipitation received after removal of the animals.

Perennial succulent and herbaceous species will likely show a rapid two-phased recovery. First will be an increase in size and vigor of existing plants. This will begin immediately upon removal of herbivory and trampling. Reproductive success will also be increased which will be followed by an increase in the number of seedlings. Seedling survival will be enhanced by the lack of herbivory and trampling. Enhanced seedling survival leads to the second phase of recovery, which is increased population density and extent. The long term effect of increased population density and extent is a reduction in vulnerability to extinction through stochastic (random) events. Proposed species that are herbaceous or succulent perennials are *Dudleya blochmaniae insularis*, *Dudleya* sp. nov., *Heuchera maxima*, and *Arabis hoffmannii*. It is possible that *Arabis hoffmannii*, which is currently presumed extirpated from the island, could be re-established. New populations of this species were discovered on Santa Cruz Island after the removal of livestock.

Shrubs and subshrubs will likely show rapid increase in size due to removal of browsing by deer and elk. Reproduction will likely be improved as more flowers and fruits remain on the plants. More seedlings will survive because they are not eaten or trampled. Populations will likely increase in extent, expanding into the annual grasslands. Shrub and subshrub species that are proposed for listing are *Arctostaphylos confertiflora*, *Berberis pinnata insularis*, *Castilleja mollis*, and *Helianthemum greenii*. *Castilleja mollis*, which is partially parasitic on *Isocoma venetus* would likely experience a double benefit as ungulate pressure is removed from both species. *Orobanche parishii*, a Park Species of Concern is also presumed to be parasitic on *Isocoma*, and so would likely benefit from any improvement in that plant's status.

Shrub and tree dominated plant communities (such as chaparral, coastal sage scrub, and mixed woodland) will respond to removal of browsing and trampling impacts. They will likely begin to develop greater species richness in their understories. As reproduction of woody species is enhanced, shrublands and woodlands will begin developing greater age and size class diversity. Seral stage diversity will also likely increase as these communities expand into their former ranges, replacing exotic annual grasslands. Fragmentation of native communities will decrease as a result of this expansion.

Even with complete and immediate removal of non-native herbivores, the reversion of annual grasslands to perennial grasslands is likely to proceed slowly. Annual grass seedlings emerge earlier in the season than perennial seedlings, and so claim a greater portion of moisture, sunlight, and space. Active restoration may be necessary to re-establish the former extent of native perennial grasslands. With the removal of grazing, prescribed fire becomes a viable tool for perennial grassland restoration. Tender young perennials that seed and sprout following fire will no longer be vulnerable to herbivory. Moreover, the temporary loss of forage from a fire will not impact a commercial livestock operation.

Complete removal of deer and elk will allow fuel loadings in shrub and woodland communities to increase. This increase will permit the use of prescribed fire in managing the woodland stands. Chaparral and Bishop pine stands will likely show marked rejuvenation after implementation of an appropriate burn program.

Complete removal of all ungulates will eliminate trampling. This will allow the re-establishment of the soil's microphytic crust. This crust will lead to a reduction in soil erosion and enhance moisture and nutrient availability to plants. Ground nesting pollinators will also benefit from removal of trampling, which may lead to improved reproductive success for native plant species.

All fennel plants on the island would be released from control by grazing. This would likely result in a large increase in seed production, which could lead to significantly increased numbers of plants on the island. Black mustard and wild radish may undergo similar increases. Thistles are likely to continue to expand, but not aggressively. The current weed management program would likely be inadequate to control the spread of these species. Depending upon the extent of the weed invasion, the appearance of the landscape may change substantially, where seasonal fluxes of black mustard or sweet fennel may mask the annual grasses underneath. Eventually (>20 years) native shrub communities would likely invade into former grasslands, further changing the character of the island's landscape.

Effects on forage availability and utilization are irrelevant, under this alternative. Forage availability would increase during the period when cattle are removed, since there would be fewer cattle grazing. Obviously, this is not an issue, since all grazing animals will have been removed from the island.

Wildlife

Implementation of this alternative would have substantial, beneficial effects on wildlife. Under this alternative, the removal of all non-native ungulates would halt deterioration of the island's habitats, with short and long-term benefits for wildlife.

The island fox, island spotted skunk, and deer mouse would benefit from an increase in cover, seeds, grasses, and other plant material as the vegetation slowly recovers; in addition, as the understory slowly recovers, the invertebrate populations should increase which would thus increase the food base for the fox, skunk, and mice. Passerine birds would benefit from an increase in nesting and resting potential as well as an increase in the understory and seed plants. Lizards would benefit from an increase in cover as well as from the increase in invertebrate/prey populations. Predators, including the gopher snake and birds of prey, would benefit from the increase in mouse and lizard populations.

The removal of ungulates from riparian areas would halt the current damage to these areas from trampling and trailing. These water sources would return to natural conditions and become more available to wildlife after the non-native ungulates are removed.

There would be no effects to wildlife from pesticide use proposed under this alternative. Method of application (spot treatment of individual plants) minimizes the amount of herbicide used and that wildlife might contact or ingest. Triclopyr has low chronic toxicity to mammals and is not expected to concentrate to any significant degree in animal tissue (EXTOXNET 1993). Triclopyr is slightly toxic to water fowl and practically non-toxic to fish and aquatic invertebrates. Glyphosate is only slightly toxic to wild birds, and is practically nontoxic to fish (EXTOXNET 1994). There is very low potential for the chemical to accumulate in the tissues of aquatic invertebrates or other aquatic organisms. In mammals, glyphosate is poorly absorbed from the digestive tract and is largely excreted unchanged; it has no significant potential to accumulate in animal tissue.

Rare Species and Their Habitats

Effects of immediate removal of ungulates on rare plant species are given in the section on vegetation, above.

Herbicide use proposed under this alternative would have no effect on listed or proposed species, except in the sense that eradication of alien species eliminates potential competitor for rare and other native plant species. Individual plants would not be affected; the spot method of herbicide application minimizes effects on non-target species. Herbicides would not be applied near populations or individuals of proposed or listed species.

Effects on western snowy plover would be identical to those described for the closure of Old Ranch Pasture under Alternative B.

Under this alternative, as under all alternatives, NPS would request consultation with USFWS regarding possible effects on listed species, and would request conference regarding possible effects on proposed species. NPS will work with USFWS to arrive at appropriate mitigation measures to avoid impacts to listed and proposed species.

Cultural Resources

Archeological Resources

Removal of all ungulates within three years would have substantial, beneficial effects on archeological resources, islandwide. Removal of ungulates would halt all current trampling damage to archeological sites. Additionally, cessation of hunting activities after three years would remove the potential for damage to archeological sites from vehicles associated with the hunt.

Historical Resources

This alternative would have no effect upon historical structures or their surrounding historic landscape preservation area. Since no proposed activities would occur at or near historic structures.

Cultural Landscape

Removal of all ungulates within three years would cause the current cultural landscape to be replaced with a landscape more nearly resembling the prehistoric cultural landscape. Since a cultural landscape study has not been completed, it is unknown what effect this would have on potential cultural landscapes.

Ethnography

Removal of ungulates from the island would have slight, beneficial effects on ethnographic resources. Removal of ungulates would return a more traditional appearance to the island. Reduction of erosion should reduce the rate at which burials are exposed. Historic Chumash villages would be less impacted by erosion.

Socioeconomic Resources

Regional Economic Environment

Under this alternative, the ranching and hunting operations on Santa Rosa Island would terminate within three years from the date of implementation of this plan. The effects of this on the regional economic environment are unknown, but likely to be negligible. If the termination of grazing allowed greater visitor access and recreational opportunities on Santa Rosa, then overall effects on the regional recreation industry would be slightly positive.

Visitor Use

Removal of ungulates within three years would have moderate, beneficial effects on visitor use. Visitor activities currently stress low-impact, low-volume activities. Due to the Park's mandate for low visitation, this approach would not change under this alternative. If this alternative is implemented, visitor use during the first three years will continue to be restricted, in order to reduce interference with the closure activities by the permittee. After these first three years, the island would be more accessible to visitors, the demonstration ranch will provide an additional visitor attraction, and recreational activity on and near Santa Rosa Island should increase.

Grazing/hunting Permittee

Implementation of this alternative would result in heavy, significantly adverse effects on the permittee. Removal of all ungulates within three years would drastically alter the current operations of the permittee. Under this alternative, the present SUP would be terminated or amended requiring the permittee to terminate commercial operations and remove all cattle, deer, elk and horses from the island within three years. Vail & Vickers would still retain the right of non-commercial use and occupancy for the 8 acre ranch complex. During the removal process, the permittee would still earn the revenue generated from the sale of each head of cattle presently on the island. However, they would incur costs to remove the cattle, deer, elk and horses within the three year time frame. The permittee will also lose the future expected revenue that would have been generated by the ranching and hunting operation until the year 2011. In addition, the employees of the permittee's ranching and hunting operations will also lose their jobs and associated income.

NPS Operations

This alternative would, overall, have both positive and negative effects on Park operations. The Park would lose the income from the annual SUP fees, which have averaged around \$43,913.55 annually over the last five years. Substantial financial investment in weed eradication and revegetation would be needed to prevent immediate and rapid explosion of non-native weedy plant species. However, NPS would not incur costs for range monitoring.

Wilderness

Implementation of this alternative would have moderate, beneficial effects on wilderness values, which would be improved. Wilderness suitability of the island will improve after all grazing is removed, and all restoration is completed. Under this alternative, restoration efforts may be completed 10-12 years earlier than in all other alternatives.

Summary

Complete and immediate removal of ungulates from Santa Rosa Island, would allow for rapid recovery of riparian areas and improvement in water quality in all drainages, and would remove all grazing and browsing pressure from rare plant species and their habitats. Several species of weeds which are currently being controlled by grazing would probably spread in extent. The permittee's operation would be terminated by implementation of this alternative.

Immediate removal of ungulates would have substantial, beneficial effects on soils, water quality and riparian areas, vegetation, wildlife, rare species and their habitats, and archeological resources. Implementation of this alternative would have no effect on historical resources, unknown effects on cultural landscapes, and slightly beneficial effects on ethnographic resources. There would be unknown effects on the regional economic environment, moderate, beneficial effects on visitor use, heavy, significantly adverse effects on the permittee, and both positive and negative effects on NPS operations. Implementation of mitigation measures identified in Section 7 consultation with USFWS will prevent impacts to rare species during the three year removal period.

Cumulative Effects

Due to the extensive landscape changes brought about by past and present land use practices, many of the cumulative effects which would be caused by this action are the same as described under previous alternatives. Future cattle grazing under this alternative includes that which would occur until all ungulates are removed from the island (within three years of plan implementation).

On other islands in the Park, past sheep and cattle grazing have led to heavy impacts on soils (Brumbaugh 1980, Johnson 1980). These impacts include intense hillside gully development and loss of soil from wind and water erosion, due to direct and indirect effects of sheep and cattle grazing, as well as loss of microphytic crust. These impacts have largely abated now that sheep and cattle are gone from these islands. Heavy, adverse effects have occurred to soils on Santa Rosa Island as a result of past and current ranching operations. Implementation of the Immediate Removal alternative. Implementation of the Immediate Removal of Ungulates alternative would begin abatement of all these effects within three years. Thus, there would be substantial beneficial cumulative effects on soils on Santa Rosa, and for soil resources on the northern Channel Islands.

Other past, present and future actions affecting water quality and riparian areas in the Central Coast region include the ongoing impacts of ranching activities throughout the Central Coast Region (this region includes Santa Cruz, Santa Clara, San Benito, Monterey, San Luis Obispo and Santa Barbara counties). The water quality problems identified for Santa Rosa Island (discharge of bacteria and sediment) are common among other rangelands in the Central Coast

Region (Michael Thomas, Central Coast Regional Water Quality Control Board, personal communication, April 26, 1996). Although the CCRWQC Board has been working with the USFS to incorporate BMPs for water quality improvement into allotment management plans on the Los Padres National Forest, BMPs are not yet in place for most of these rangelands. As a result, there are ongoing, adverse impacts to water quality and riparian areas in other areas of the Central Coast region. If BMPs are implemented on these rangelands, these adverse impacts may be reduced.

As stated in this draft EIS, past grazing by the current permittee on Santa Rosa Island has rendered many drainages non-functional as riparian areas (Rosenlieb et al. 1995). Under this alternative, the phased closure of pastures and reduction in stock as well as the implementation of rotational grazing would begin to restore riparian function to Santa Rosa Island drainages. Under the Immediate Removal alternative, water quality on Santa Rosa would improve and there would be a slight positive cumulative effect on water quality in the Central Coast Region.

Other past, present and future actions affecting vegetation, which are detailed in the cumulative effects section of the No Action alternative, mainly result from past ranching activities on other northern Channel Islands and ongoing feral pig and sheep damage on Santa Cruz Island. In general, these actions have caused widespread conversion of native shrublands and perennial grasslands to communities dominated by non-native annual grasses and weeds. The removal of all ungulates under this alternative would reduce grazing and browsing pressure on shrub communities, and chaparral and coastal sage scrub would begin to recover. Recovery of chaparral and coastal sage scrub communities on Santa Rosa could add substantially to the extent of those communities on the northern Channel Islands. Chaparral currently occupies about 18,000 acres on Santa Cruz Island, and 2,600 acres on Santa Rosa. Removal of deer would also reduce browsing pressure on Bishop pine woodland, which on the islands, only occurs on Santa Cruz and Santa Rosa Island. Thus, implementation of this alternative would have substantial beneficial cumulative effects on shrub and woodland communities of the northern Channel Islands.

The status of the island spotted skunk and Santa Cruz gopher snake on Santa Cruz Island is unknown. Although habitat is generally better on Santa Cruz due to increased cover and greater areal extent of shrub communities, current feral pig rooting and sheep grazing on Santa Cruz may decrease or limit available habitat for both island spotted skunk and Santa Cruz gopher snake. The effects of this limitation of habitat for both species, are unknown. These two taxa are limited in geographic range to Santa Cruz and Santa Rosa Islands. The status of both the skunk and the snake may improve under this alternative when shrub and riparian habitats begin to recover and expand. Implementation of this alternative would thus have substantial beneficial effects on these species on Santa Rosa Island and substantial overall beneficial effects on these species.

Heavy, significantly adverse impacts to rare species and their habitats are the result of the combined effects of past and current grazing and browsing by non-native ungulates. These effects are not limited to Santa Rosa Island, but have occurred on all of the northern Channel Islands, and are discussed under the Cumulative Effects section for the No Action alternative. Past and current land use practices on Santa Rosa Island have been identified by U.S. Fish and Wildlife Service as a factor contributing to the rarity and possible extirpation of the 11 Santa Rosa species proposed for listing as endangered. Under the Immediate Removal alternative, the complete removal of all ungulates within three years would result in significant beneficial effects

on rare species, thus beginning to reverse the negative cumulative effects of past land use practices. Of the 11 species proposed for listing as Endangered, four occur only on Santa Rosa, and thus the actions proposed under this alternative would benefit each taxon over the entire range of its distribution. Four other species are extant on Santa Rosa and occur or previously occurred on other islands. These taxa would accrue benefits for a portion of their range or former range. The two remaining species are thought to be extirpated on Santa Rosa Island, but are known to occur on other islands. These taxa would also accrue benefits for a portion of their range or former range. The benefits to Santa Rosa species from implementation of this alternative would comprise a significant beneficial effect on rare species on the northern Channel Islands.

Although significant past and present effects on western snowy plover, California brown pelican and peregrine falcon populations on a regional and national level have led to their designation as threatened or endangered, implementation of this alternative would result in negligible cumulative effects on these listed species. Recovery of populations of the latter two species in the Southern California Bight will occur regardless of the alternative chosen in this plan. There are now about eight successful breeding pairs of peregrines which nest annually on the northern Channel Islands. Although Channel Islands peregrines still exhibit reproductive and survival problems due to accumulation of organochlorines, USFWS has published a notice of intent to prepare a proposed rule removing peregrines from the list of threatened and endangered species due to overall recovery of the species (Federal Register 60 [126]:34406-409). Cumulative effects on western snowy plover will also be negligible. Although plover nesting habitat in Old Ranch Pasture would be protected by removal of cattle, nest failure at Skunk Point may remain high due to high winds and predation, and the site may not add significantly to plover production over the range of the species.

Moderate, significantly adverse effects on cultural resources have occurred due to the combined direct effects of past trampling by non-native ungulates. These effects would be abated by removal of ungulates under this alternative. This would comprise a significant beneficial cumulative effect on cultural resources on the northern Channel Islands.

Under this Targeted Management Action alternative, cumulative effects on the permittee (ranch operations) would be heavy and adverse, due to economic impacts such as loss of overall grazing capacity on the island, loss of revenue from the hunt, and costs incurred from removing the deer and reducing the elk.

Mitigation Required

The Park would need to control visitor use and access while ungulate removal is occurring. NPS would also need to oversee removal activities to insure no impacts to other resources from vehicle damage, etc. Therefore, NPS will require the permittee to submit a detailed removal plan, with timetable, subject to NPS approval. NPS staff will be on hand to oversee removal activities.

To avoid impacts to listed and proposed species, the Park would implement any mitigation measures derived through consultation and conferencing with USFWS.

UNAVOIDABLE ADVERSE IMPACTS

The impacts identified below for each alternative are those for which there are no mitigating measures or which could not be mitigated to a level of insignificance.

Alternative A No Action

The No Action alternative, by definition, contains no measures to mitigate impacts to resources. Thus, continued cattle grazing and game ranching on Santa Rosa Island under this alternative will result in unmitigated, significant, adverse impacts to soils, water quality and riparian areas, vegetation, rare species and their habitats, and archeological sites.

Alternative B Minimal Action

In streams or pastures not targeted for management actions (South , Wire Field, Carrington and Lobo), there would be continuation of current adverse effects of continuous grazing on riparian areas, water quality, populations of rare species and their habitats, archeological sites, and soil.

Alternative C Targeted Management Action

In pastures not targeted for management actions (South, Pocket Field, Lobos, Carrington, Wire Field) as well as in some areas of targeted pastures (North), there would be continuation of current adverse effects of continuous grazing on riparian areas, water quality, populations of rare species and their habitats, archeological sites, and soil.

Alternative D Revised Conservation Strategy (The Proposed Action)

In South Pasture, there would be continuation of current adverse effects of continuous grazing on riparian areas, water quality, archeological sites, and soil, until stocking rate is decreased in 2007.

Alternative E Immediate Removal of Ungulates

There would be continuation of current adverse effects of continuous grazing on riparian areas, water quality, and archeological sites, for the three year removal period, or until stocking rate decreased substantially.

RELATIONSHIP BETWEEN SHORT-TERM USES OF MAN'S ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

Alternative A No Action

Under the No Action alternative, some short-term uses of the environment on Santa Rosa Island will continue until 2011. These include all aspects of the cattle ranch and commercial hunt operations. During that 15 year time period, the permittee will annually use the available forage on the island to feed cattle for the stocker operation, and to support the existing herds of deer and elk for the commercial hunt operation. Under the No Action alternative, there will be no new existing short-term uses that will affect long-term productivity.

Alternative B Minimal Action

Under the Minimal Action alternative, some short-term uses of the environment on Santa Rosa Island will continue until 2011. These include cattle ranching at current levels, except for the closure of Old Ranch Pasture, and commercial hunting of elk. During that 15 year time period, the permittee will annually use the available forage on the island to feed cattle for the stocker operation, and to support the existing herd of elk for the commercial hunt operation. Under the Minimal Action alternative, there will be no new existing short-term uses that will affect long-term productivity.

Alternative C Targeted Management Action

Under the Targeted Management Action alternative, some short-term uses of the environment on Santa Rosa Island will continue until 2011. These include cattle ranching at current levels, except for the closure of Old Ranch Pasture and implementation of rotational grazing in North Pasture. Additionally, the permittee will continue the commercial hunt operation for elk. During that 15 year time period, the permittee will annually use the available forage on the island to feed cattle for the stocker operation, and to support the existing herd of elk for the commercial hunt operation. Under the Targeted Management Action alternative, there will be no new existing short-term uses that will affect long-term productivity.

Alternative D Revised Conservation Strategy (The Proposed Action)

Under the Targeted Management Action alternative, some short-term uses of the environment on Santa Rosa Island will continue until 2011. These include cattle ranching until pastures are phased out from grazing, or until islandwide stocking rate decreases. Additionally, the permittee will continue the commercial hunt operation for elk, though that will be phased out also. During that 15 year time period, the permittee will annually use the available forage on the island to feed cattle for the stocker operation, and to support the existing herd of elk for the commercial hunt operation, though incrementally less each year. Under the Revised Conservation Strategy alternative, there will be no new existing short-term uses that will affect long-term productivity.

Alternative E Immediate Removal of Ungulates

Under the Targeted Management Action alternative, some short-term uses of the environment on Santa Rosa Island will continue until the end of the three year period for ungulate removal.

These uses include cattle ranching and commercial hunt operations for deer and elk. It is unlikely that these short-term uses would have effects on long-term productivity by causing long-term impacts to natural and cultural resources on Santa Rosa Island. Under the Immediate Removal alternative, there will be no new existing short-term uses that will affect long-term productivity.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

Irreversible commitments are those which cannot be reversed, except perhaps in the extreme long term. For example, extinction of a species is an irreversible loss. *Irretrievable* commitments are those that are lost for a period of time. For example, restriction of visitor use while an area is temporarily closed would be an ongoing irretrievable loss. The following section identifies irreversible and irretrievable commitments of resources resulting from affirmative actions identified in the various alternatives.

Alternative A No Action

Under the No Action alternative, loss of soil to erosion and the potential extirpation of rare taxa would represent irreversible or irretrievable loss of resources.

Alternative B Minimal Action

Under the Minimal Action alternative, there would be no irreversible or irretrievable loss of resources due to identified actions.

Alternative C Targeted Management Action

Under the Targeted Management Action alternative, there would be no irreversible or irretrievable loss of resources due to identified actions.

Alternative D Revised Conservation Strategies (The Proposed Action)

Under the Revised Conservation Strategy alternative, there would be no irreversible or irretrievable loss of resources due to identified actions.

Alternative E Immediate Removal of Ungulates

Under the Immediate Removal of Ungulates alternative, there would be no irreversible or irretrievable loss of resources due to identified actions.

CONSULTATION AND COORDINATION

THE EIS PROCESS AND PUBLIC REVIEW

All federal actions are subject to review under the National Environmental Policy Act of 1969, which requires federal agencies to assess the environmental consequences of proposed and alternative actions. Because the proposed actions of this resources management plan comprise a major federal action with sufficient controversy, an *environmental impact statement* (EIS) is being prepared to assess the impacts of this action on the natural and cultural environment.

The EIS process is implemented to provide managers with a process for decision-making, and to insure that proposed federal actions have adequate review by the public and other agencies. Though not required by law, public input and review is an integral part of the EIS process, and occurs at all stages. The process begins with *scoping*, in which the federal agency presents the problem to the public and solicits comments both on the *issues* to be considered and the *range of alternatives* which the government should consider when developing solutions to the problem. Using this input, the agency then develops its preferred alternative, which is presented in a *draft environmental impact statement* for a mandatory public review period of 60 days. Public comments are then incorporated into the *final environmental impact statement*, which is released for a 30-day review period before implementation.

HISTORY OF PUBLIC INVOLVEMENT

In order to solicit public participation in developing the issues and range of alternatives to be considered in this plan, the Park conducted a comprehensive public scoping process. The scoping process for this resources management plan began when NPS published a Notice of Intent to prepare an EIS in the Federal Register on September 15, 1995. The Park then held a series of public meetings and workshops to solicit public opinion on the issues and range of alternatives to be considered.

The Park held three public scoping meetings on October 18, 1995, October 24, 1995 and November 7, 1995. These meetings were publicized through press release and invitations were mailed to over 100 individuals that had previously expressed interest in the issue. Over 40 people attended each meeting. The Park also provided opportunity for written comment to those that were not able to attend the meeting or did not want to speak publicly. Comment cards were designed and used for this purpose. Lastly, the Park created one-page planning updates to inform the public of the Park's progress throughout this process. Three different planning updates have been mailed to over 100 interested parties.

The Park prepared and distributed a draft resources management plan and environmental impact statement to affected public agencies, special interest groups, businesses and individuals in May 1996. A Notice of Availability was published in the Federal Register on May 24, 1996. The 60-day comment period was extended an additional 45 days, and ended on September 9, 1996. A public meeting was held in Santa Barbara on August 21, 1996, to provide an opportunity for the public to submit oral and written comments on the Draft RMP/EIS.

PUBLIC REVIEW OF THE DRAFT ENVIRONMENTAL IMPACT STATEMENT

Comments were received orally and in written form following the release of the Draft RMP/EIS in May 1996. All comments were examined and considered by the National Park Service according to the requirements of 40 CFR 1503 (the implementing regulations for the national Environmental Policy Act). Those comments which were “substantive”, and not simple statements for or against the proposal, are responded to in the chapter Response to Public Comments.

RECORD OF PUBLIC COMMENT

A Notice of Availability was published in the Federal Register on May 24, 1996, for the Draft Resources Management Plan and Environmental Impact Statement for Improvement of Water Quality and Conservation of Rare Species and their Habitats on Santa Rosa Island. The 60-day comment period was to end on July 23, 1996. Approximately 400 copies of the draft were distributed to public agencies(see list of agencies, below), special interest groups, businesses, and individuals.

On July 19, 1996, a notice was published in the Federal Register announcing that the comment period for the Draft RMP/EIS had been extended 45 days, to September 9, 1996.

A public meeting was held in Santa Barbara on August 21, 1996. Notices of the public meeting were sent to each recipient of the draft document and to local newspapers, and a notice was published in the Federal Register on July 19, 1996.

PUBLIC MEETING

The purpose of the public meeting held in Santa Barbara on August 21, 1996, was to provide opportunity of the public to ask questions about the draft and submit oral and written comments on it. Approximately 50 people attended the meeting. Seven members of the public chose to deliver oral comments on the Draft RMP/EIS. The Acting Superintendent answered questions from the public regarding the Draft RMP/EIS and the planning process. Responses to substantive comments received during the public meeting, organized by subject matter, are included in the Response to Public Comments chapter of this Final RMP/EIS.

WRITTEN COMMENTS

During the comment period, 244 letters were received from public agencies, special interest groups, businesses and individuals. Of these, 67 contained substantive issues that required clarification of information in the draft environmental impact statement, modification of the text, or direct responses. Since many substantive comments were similar in content, they are addressed by subject matter in a question and answer format (see Response to Public Comments chapter). All the comment letters from public agencies are reprinted in Appendix C, Comment Letters from Public Agencies.

AGENCIES WHICH RECEIVED COPIES OF THE DRAFT RMP/EIS

California Coastal Commission
California Department of Fish and Game
California Department of Parks and Recreation
Cachuma Resource Conservation District
California Regional Water Quality Control Board - Central Coast Region
Natural Resources Conservation Service
Santa Ynez Indian Reservation
State Historic Preservation Office
U.S. Environmental Protection Agency
U.S. Fish and Wildlife Service
U.S. Forest Service, Los Padres National Forest
U.S. Navy, Naval Air Weapons Stations, Pt. Mugu

RESPONSE TO PUBLIC COMMENTS

PURPOSE AND METHODOLOGY

The final environmental impact statement is to be an accurate analysis of impacts of the proposed action and its alternatives. Public and agency review of the draft statement helps to ensure quality.

The National Park Service received 244 comment letters during the public comment period for the *Draft Resources Management Plan and Environmental Impact Statement for Improvement of Water Quality and Conservation of Rare Species and Their Habitats on Santa Rosa Island*. This chapter contains responses to substantive comments received by the National Park Service during the public comment period.

Substantive comments are defined as

- not simple statements for or against the proposal
- those requiring additional explanation or analysis of data
- those that debate facts or conclusions reached in the draft environmental impact statement

ORGANIZATION OF COMMENTS AND RESPONSES

Comments have been arranged by broad topic (such as Grazing Management) and specific issue (such as Management of Horses). Answers to questions and responses to comments are given in the Response to Comments section of this chapter, and have been incorporated into the text of this Final RMP/EIS as appropriate. The list of commentors is given in the Index of Comment Letters by Category of Author section, which follows.

INDEX OF COMMENT LETTERS BY CATEGORY OF AUTHOR

The topic of each substantive comment contained in the following comment letters is listed following each author. Refer to those sections of this document to find the answers to each comment.

Public Agency Comment Letters

Cachuma Resource Conservation District (Road Management, Weed Management)	U.S. Environmental Protection Agency (Deer/elk Management, Road Management, Water Quality/riparian Areas, Weed Management)
California Regional Water Quality Control Board - Central Coast Region (Road Management, Water Quality/riparian Areas, Weed Management)	U.S. Fish and Wildlife Service (Alternatives in the Draft RMP/EIS, Goals and Objectives, Grazing Management, Rare Species, Road Management, Socioeconomic Issues, Soils, Water Quality/riparian Areas, Wildlife)
Natural Resources Conservation Service (Cultural Resources, Grazing Management, Monitoring, Rare Species, Soils, Vegetation, Weed Management, Wildlife)	

Special Interest Group Comment Letters

California Cattlemen's Association (Fire Management, Grazing Management, Soils, Water Quality/riparian Areas)	California Wilderness Coalition (Socioeconomic Issues)
California Native Plant Society (Roberson) (Alternatives in the Draft RMP/EIS, Deer/elk Management, Fire Management, Goals and Objectives, Grazing Management, Monitoring, Rare Species, Road Management, Socioeconomic Issues, Soils, Vegetation, Water Quality/riparian Areas, Weed Management)	Friends of the Scrub Natural Resources Defense Council (Grazing Management, Socioeconomic Issues)
California Native Plant Society, Los Angeles/Santa Monica Mountains Chapter	Range Watch (Ecosystem Management, Socioeconomic Issues, Soils, Weed Management)
California Native Plant Society, Monterey Bay Chapter	Santa Barbara Urban Creeks Council (Alternatives in the RMP/EIS, Monitoring, Restoration Plans, Socioeconomic Issues, Soils, Vegetation, Water Quality/riparian Areas, Weed Management, Wilderness, Wildlife)
	Santa Barbara County Cattleman's Association (Grazing Management)

RESPONSE TO PUBLIC COMMENTS

Santa Cruz Island Foundation (Cultural Resources, Geological Resources, Grazing Management, Rare Species, Soils, Water Quality/riparian Areas)

Santa Rosa Chapter, Santa Cruz Island Foundation
Save Our Coast
Washington Native Plant Society (Rare Species)

Business Comment Letters

Multiple Use Managers, Inc. (Deer/elk Management, Fire Management, Monitoring, Vegetation, Weed Management)
Vail & Vickers (Deer/elk Management, Grazing Management, Legal

Authorities, Agency Policies and Guidelines, Monitoring, Rare Species, Restoration Plans, Road Management, Socioeconomic Issues, Water Quality Riparian Areas)

Individual Comment Letters

Anderson, Marjorie
Avanti, Mary
Ayers, Mark R.
Bar, Alan
Barrett, Karen (Alternatives in the RMP/EIS)(Grazing Management, Water Quality/riparian Areas)
Bartolome, James W.
Bell, Barbara
Belnap, Jayne (Altrnatives in the RMP/EIS, Legal Authorities, Agency Policies, and Guidelines, Socioeconomic Issues, Soils, Weed Management)
Berghaier, Robert
Blakley, Stephen (Ecosystem Management)
Blanchard, Bob, Jr.
Branch, Thomas L., and Pamela A. Branch
Broussard, William J.
Brown, Elisabeth
Brown, Marlene
Bryant, Paul M. (Ecosystem Management)
Burgess, Jeff (Legal Authorities)
Burk, Peter, and Joyce Burk
Byrd, Stephen (Socioeconomic Issues)
Cardenas, Eric (Vegetation)
Carroll, Mark S.

Carson, Carol
Cela, Bill
Chalinski, Ontario
Christensen, Robert
Chubb, Charles (Ecosystem Management)
Chubb, Mimi (Ecosystem Management)
Chue, Lisa
Cloud, John (Legal Authorities, Socioeconomic Issues)
Coe, Clarence S.
Collignon, Karen
Combs, Mike
Combs, Tim
Connelly, Abigail
Conroy, James (Legal Authorities)
Cornelius, Lynn R. (Ecosystem Management)
Coughlin, Michael
Counterman, S.
Coyle, Eric
Crabtree, Sandy
Crawford, John Vickers, and Anne Vickers (Nancy) Crawford (Grazing Management, Legal Authorities, Agency Policies and Guidelines, Soils, Water Quality/riparian Areas)
Crooks, William and Ramona Crooks
Cuffe, Brian T.
Czapla, Barbara

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Davis, Richard	Flynn, Zelma C. (Legal Authorities, Agency Policies, and Guidelines)
Dean, Earl L.	Fogle, Margueriette E.
Denison, Mr. and Mrs. J.L.	Fontenot, Kim, and Donald Fontenot
Dickinson, Selden C.	Furmanski, Monica
DiCroce, Shirley N. (Ecosystem Management)	Gaber, J. F.
Dodero, Mark W.	Glick, Ronnie (Alternatives in the RMP/EIS, Legal Authorities, Agency Policies, and Guidelines, Rare Species, Socioeconomic Issues, Soils, Vegetation, Water Quality/riparian Areas)
Doherty, Anne	Gliessman, Stephen R, Elizabeth Painter, Jayne Belnap, Dirk Van Vuren, Tom Dudley, Carla D'Antonio, Peter Raven, and Mark Eggar (Water Quality/riparian Areas, Weed Management)
Donnellan, Micael D. (Rare Species)	Goldman, Michael F. (Legal Authorities, Agency Policies, and Guidelines, Socioeconomic Issues)
Dornblaser, Mark	Griffith, Marlene
Dremann, Craig C. (Grazing Management, Legal Authorities, Agency Policies, and Guidelines, Vegetation, Water Quality?riparian Areas, Wilderness)	Hafsrud, Susan T., Norman R. Hafsrud, and Eric R. Hafsrud
Drum, Robert	Hallman, Patricia
Dryer, Chris (Legal Authorities, Agency Policies, and Guidelines, Socioeconomic Issues)	Halpin, William F. (Ecosystem Management)
Dudley, Tom (Restoration Plans, Vegetation, Water Quality/riparian Areas, Weed Management)	Hammett, Benjamin C.
Duffield, Kathy	Hansen, Doug
Dyer, Brenda B. (Ecosystem Management)	Helgeland, Sylvia
Eddington, Barbara	Hessing, Richard J.
Edgar, Bryan	Horton, Barbara
Edlund, Sharilyn	Hubbs, Earl L.
Edwards, Marcia	Humes, Sherry
Eggers, Henry (Rare Species)	Hurst, Gerry (Ecosystem Management)
Eggers-Jones, Ann	Hutton, Patti H.
Eilers, Stan	Ice, Diana Carolyn
Ellison, Elaine	Johnson, Barbara
Ettell, Harry	Johnson, Geraldine
Everett, William T. (Rare Species, Weed Management)	Jones, D. Cris (Cultural Resources, Grazing Management, Legal Authorities, Agency Policies, and Guidelines, Rare Species, Water Quality/riparian Areas)
Fahs, Alice	Jones, Stephen A.
Fallon, David R.	Kahn, Randy (Ecosystem Management)
Fallord, Audrey	Kanne, Robert M.
Fellers, Gary M. (Deer/elk Management, Socioeconomic Issues, Wildlife)	Kayon, Renee K.
Fickling, Karl F.	
Filkins, Susanne K. (Ecosystem Management)	
Flake, Victor J., and Kim Y. Flake	
Flake, Victor J.	
Fleming, Janis	
Flexner, Barbara L.	

RESPONSE TO PUBLIC COMMENTS

Ketchum, Helen	Painter, Elizabeth L. (Alternatives in the
Killian, John S.	RMP/EIS, Cultural Resources,
Kleinfield, Elizabeth	Ecosystem Management, Geological
Kleist, Kristopher D.	Resources, Goals and Objectives,
Klinger, Rob (Alternatives in the	Grazing Management, Legal
RMP/EIS, Goals and Objectives,	Authorities, Agency Policies, and
Monitoring, Weed Management)	Guidelines, Monitoring, Rare
Kluth, Paul	Species, Restoration Plans,
Knutson, Ruth C.	Socioeconomic Issues, Soils,
Kohler, Tim	Vegetation, Water Quality/riparian
Kroll, Shelly (Ecosystem Management)	Areas, Weed Management,
Kroll, Sondra	Wilderness, Wildlife)
Landers, Karen	Parkerson, David
Larkey, Alex	Paumi, Joseph
Larson, Jeanne	Pettit, Marie B.
LeRoy, Eileen G.	Pogue, H.
Lewis, Mary Page	Reamer, Charles A.
Libby, Hy	Reiner, Jeff (Monitoring, Water
Lilenthall, Betty H., et al.	Quality/riparian Areas)
Locke, Jen H.	Reitz, Edna Maisner
Mackler, Melville (Ecosystem	Reitz, G.
Management, Socioeconomic Issues,	Ringer, June
Soils)	Robbins, Eleanor C.
Malinin, Mike	Ruderman, Denise (Ecosystem
Maloney, Ken, and Julie Ford-Maloney	Management)
Mann, Sandra L.	Rustkowski, Robert
Mannchen, Brandt	Ryall, Marjorie M.
Marlowe, Marcia A.	Rydman, Linda R.
Mayall, Donald	Sacino, Laura, and Rob Sacino
McCann-Sayles, Alan, and Sarah Scher	Salisbury, Paulette
McKinley, Corenne M. (Ecosystem	Salmon, Leah E.
Management)	Saretsky, Richard
McLean, Malcom	Sattler, Genevieve, and William Sattler
Mroziushi, Christi A.	Schneider, David L.
Murawski, Pamela	Schwabauer, Arlys
Murphy, Laura M.	Sherman, Lynne (Grazing Management,
Myers, Janis	Socioeconomic Issues)
Nelson, Eric	Sherman, Rebecca
Newgard, Robert A.	Shuken, Howard L.
Niswander, M. Ruth	Sigg, Jacob (Legal Authorities, Agency
Noramly, Selina	Policy, and Guidelines)
Nuccio, Robert	Simon, Nathan M.
O'hare, John	Simpson, Christine M. (Ecosystem
O'Neill, Cora	Management)
Ochoa, Carol	Sinclair, I.B.
Olson, Lynn	Skinner, Ida C.
Orlovsky, S. Jean	Smay, Betty
	Smith, Betty

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Smith, David, and Lisa Smith (Grazing Management, Socioeconomic Issues, Water Quality/riparian Areas, Weed Management)	Vandenburgh, William G.
Smith, Sarajane	Vasquez, Andrew L.
Soria, Norma R.	Walker, Clark, and Paula Walker
Spelts, Gayle M.	Walter, Marilyn J.
Starrett, Mildred J.	Warnick, Jeremy N.
Starshine, D.	Weber, James G.
Staubery, Rose Ellen	Wetherwax, Margriet (Rare Species)
Stevens, William M., Jr.	Whitaker, Howard J.
Stoddard, Barbara (Ecosystem Management)	White, William P.
Stoller, Sybil W.	Whitehouse, Alan
Stone, Ned W. (Ecosystem Management)	Wiltse, Diana
Suk, Thomas	Wimsett, Nancy Boone
Swanberg, Lee	Wolfe, Dwight
Syrjala, Edward S.	Wooley, John J. (Legal Authorities, Agency Policies, and Guidelines, Vegetation, Water Quality/riparian Areas)
Thacker, Joel E.	Wooley, Margaret V. (Cultural Resources, Legal Authorities, Agency Policies, and Guidelines)
Thobe, Mary P. (Ecosystem Management)	Yaeger, T. Bowman
Thomas, Rachel	Yates, Meredith
Tinsley, Wilma A.	Yoder, Vincent (Alternatives in the RMP/EIS, Legal Authorities, Agency Policies, and Guidelines)
Todd, Russell	Yost, Peggy, et al.
Tuck, Gene (Ecosystem Management)	
Turner, Debra L. (Ecosystem Management)	
Tyner, Robin	

RESPONSE TO COMMENTS

Alternatives in the Resources Management Plan And Environmental Impact Statement

Issue: Alternatives Considered in the Draft RMP/EIS

Comment Letters: California Native Plant Society (Roberson), Santa Barbara Urban Creeks Council, Karen Barrett, Jayne Belnap, Bob Blanchard, Jr., Ronnie Glick, Vince Yoder

- Q. The Draft RMP/EIS should consider the following alternatives:
- Grazing phaseout versus rapid removal, with and without weed control
 - Gradual reduction of AUM's, islandwide
 - Phaseout of cattle, elk and deer over a period determined to be least detrimental to the island and its threatened species
 - Limit grazing by area based on slope and distance to creek, by watershed, or by AUM
 - Active restoration (planting and hydroseeding) in conjunction with varied levels of grazing
 - Establish a pilot high density, short duration grazing project on a significant portion of the island

RESPONSE TO PUBLIC COMMENTS

- Phaseout of all exotic herbivores over a 10-year period, with fencing of rare species, herding of livestock and development of alternative water sources to keep livestock away from sensitive resources during the phaseout period
- A. *The park considered a wider range of actions and alternatives than what was ultimately included in the draft RMP/EIS. Many of the suggested actions are a component of the alternatives which were evaluated in the draft document.*

The alternatives evaluated in the draft RMP/EIS represent an array of alternatives capable of permitting a reasoned choice between management actions which could be implemented on Santa Rosa Island to achieve park goals. We feel that the array of alternatives presented was adequate to foster informed public participation and informed decision-making by the NPS.

Issue: Impact Topics Considered in the Draft RMP/EIS

Comment Letters: Santa Barbara Urban Creeks Council

- Q. The Draft RMP/EIS failed to consider the following impact topics:
- erosion rates (bank and watershed)
 - streambed constituency
 - genetic diversity of vegetation
 - thermal pollution
 - eutrophication
 - bio-contamination of water effect on wildlife
 - topsoil depth
 - gullying
 - estuary impacts
 - aesthetics
 - all of the above as they relate to impacts to biota
- A. *The Park considered erosion rates, gullying, estuary impacts, and aesthetics in its environmental analysis. The other topics mentioned were not considered because either they are components of other impact topics (topsoil depth is a component of soils, for example) or they are not relevant.*

Issue: Choice of Preferred Alternative

Comment Letters: California Native Plant Society (Roberson), Jayne Belnap, Ronnie Glick, Rob Klinger

- Q. The NPS should specify what factors or weighting criteria led to the decision to choose Alternative C over the other two alternatives (D and E) which would better achieve plan objectives and comply with existing laws and policies.
- A. *The final preferred alternative is different than the alternative which was proposed as a preferred alternative in the draft plan. The NPS considered the comments received from the public, as well as additional information, in determining the final preferred alternative.*

According to regulations promulgated by the Council on Environmental Quality, NEPA requires the lead agency to explore and evaluate a range of alternatives, including reasonable alternatives not within the lead agency's jurisdiction. See, 40 C.F.R. § 1502.14. The final RMP EIS evaluates and discloses the environmental impacts of five different alternatives for the improvement of water quality and the conservation of rare species. However, NEPA does not require federal agencies to identify in an EIS the degree to which each alternative meets agency mandates. Information regarding the extent to which the selected alternative meets agency mandates is typically included in the agency's Record of Decision. The NPS expects to issue a Record of Decision for this EIS approximately 30 days after publication of the Final EIS. The NPS will explain the basis for its selection of one alternative over all others when it issues the Record of Decision for this EIS.

- Q. Why did NPS convene a panel of expert biologists to craft an alternative (Alternative D, developed by the Conservation Strategies Document team) and then ignore their advice?
- A. *The advice and information developed by the Conservation Strategies Document team was used throughout the process of development of the RMP/EIS. The final preferred alternative is based on modifications the Conservation Strategies Team made to Alternative D following their consideration of public comments and other information regarding the condition of island resources.*

Issue: Sufficiency of Information in the RMP/EIS Alternatives

Comment Letters: U.S. Fish and Wildlife Service

- Q. The alternatives presented in the draft RMP/EIS fail to provide sufficient information to allow the reader to fully understand the proposed actions.
- A. *The Draft and Final RMP/EIS both contain a full representation of the proposed actions and a reasonable examination of environmental impacts. A second document, the Park's "Biological Assessment on Effects of Park Activities on Proposed Plant Taxa; Santa Rosa Island, Channel Islands National Park" contains much more detail on proposed plant taxa and the impacts of the proposed action on those taxa.*

Issue: Irreversible and Irretrievable Commitments of Resources

Comment Letters: U.S. Fish and Wildlife Service, Santa Barbara Urban Creeks Council

- Q. The assessment reached by NPS for the No Action alternative is incorrect. The loss of soils due to erosion and the potential extinction of taxa should be considered as irreversible and irretrievable commitments of resources that may occur as a result of a decision by NPS to allow the ranching operation to continue in its present form.
- A. *This is correct, and the No Action Alternative in the Final RMP/EIS has been revised to reflect this.*

Issue: Cumulative Impacts of the Alternatives

Comment Letters: National Parks and Conservation Association, Santa Barbara Urban Creeks Council

Q. Considering that the impacts to Santa Rosa Island's resources are cumulative, the Preferred Alternative, as well as Alternatives A and B, will actually increase impacts over the next 15 years. The RMP/EIS should indicate that deterioration will continue at specific, possibly increasing rates until grazing ceases, resulting in a net, possibly permanent ecological degradation, potentially including loss of native species, and reduced diversity and abundance.

A. *Actual rates of "deterioration" are not expected to increase under any alternative. For example, erosion rates would not increase, even under the no action alternative.*

Issue: Short Term Use of the Environment versus Long-term Productivity

Comment Letters: Santa Barbara Urban Creeks Council, Jayne Belnap

Q. The long-term productivity of the environment has already been compromised by the long history of grazing on the island. It will be further compromised unless grazing is halted.

A. *The present landscape on Santa Rosa island is the result of over 150 years of land-use practices. Given the long history of grazing on Santa Rosa Island, its continuation until 2011, even at current levels, will not result in new short-term uses that significantly affect long-term productivity.*

Issue: Irreversible and Irretrievable Commitments of Resources

Comment Letters: Jayne Belnap

Q. The loss of riparian genetic material, such as cottonwoods, is a loss of an irreplaceable resource.

A. *This is correct, and the No Action Alternative in the Final RMP/EIS has been revised to reflect this.*

Issue: Adequacy of the Alternatives to Achieve Plan Goals

Comment Letters: National Parks and Conservation Association, Santa Barbara Urban Creeks Council, Jayne Belnap, Ronnie Glick, Rob Klinger, Elizabeth L. Painter, Vince Yoder

Q. None of the alternatives except Alternative E meets all stated goals of the RMP/EIS. The existing Preferred Alternative does not protect or enhance Santa Rosa Island's natural resources, including native plants and water quality. It does not achieve any of the three stated goals of the Plan. Only Alternative E (Immediate Removal) satisfies the stated purpose of the plan.

RESPONSE TO PUBLIC COMMENTS

A. *The Park has altered the preferred alternative to ensure compliance with the purpose of the plan and all applicable laws and regulations.*

Q. Under the existing Preferred Alternative, recovery of one area will occur at the expense of another. NPS mandates for resources management will not be met in such sacrifice areas.

A. *The NPS has modified the Proposed Action. We feel that the final Proposed Action, Alternative D: Modified Conservation Strategies, will result in improvement in resource conditions in ALL areas of Santa Rosa Island.*

Q. If Alternative D was modified to eliminate proposed impacts to rare plant species/habitats, to reduce levels of impact island-wide, and to make a serious commitment to weed research, it would meet the goals of the RMP/EIS. It would have greater potential than A-C of allowing meaningful research coordinated with phased withdrawal of livestock and would allow NPS to diminish any hypothesized negative impacts of abrupt management change.

A. *The final proposed action is Alternative D: Modified Conservation Strategies. This alternative provides an orderly removal of non-native ungulates from Santa Rosa Island in a manner that eliminates impacts to the most sensitive resources most rapidly. The NPS will be able to focus weed control and native ecosystem restoration on those portions of the island which continue to support the most threatened resources. Additionally, Alternative D provides considerable opportunity for research into the changes brought about by removal of ungulates.*

Q. Only Alternative E meets the stated RMP/EIS goal to “conserve and restore rare plant and animal species and their habitats.” Only Alternative E actually reduces negative impacts to rare taxa. The other alternatives would increase adverse impacts either by increasing current direct and indirect impacts or through failure to remove on-going cumulative impacts.

A. *The NPS disagrees with this comment. Modified Alternative D assures that impacts to all rare taxa would be reduced. The USFWS’ conference opinion concurs with this conclusion.*

Q. None of the alternatives contain management actions that would achieve the stated plan goal to “ensure that alien plant species will not threaten restoration of rare species and their habitats.

A. *The final proposed action, Alternative D, contains actions to restore native ecosystems and remove alien species. The highest priority for these actions will be in habitats occupied by rare species.*

Issue: Technical Adequacy of the Preferred Alternative

Comment Letters: National Parks and Conservation Association

RESPONSE TO PUBLIC COMMENTS

- Q. The Preferred Alternative is not based upon the best available science. The RMP/EIS should be submitted to a peer review panel to ensure that the management strategy adopted is the best for Santa Rosa Island's resources and is based on conservation biology.
- A. *It is the responsibility of the NPS to determine the alternative that best meets our mandates for management of park units. The agency relied on the advise of the Conservation Strategies Team, NPS resource specialists, and scientific information in our development of the final preferred alternative.*

The NPS expects to issue a Record of Decision for this EIS approximately 30 days after publication of the Final EIS. The NPS will explain the basis for its selection of one alternative over all others when it issues the Record of Decision for this EIS.

Cultural Resources

Issue: Management of Cultural Resources on Santa Rosa Island

Comment Letters: Santa Cruz Island Foundation, D. Chris Jones, Elizabeth L. Painter, Margaret V. Wooley

- Q. Since Public Law 96-199 (the law establishing Channel Islands National Park) calls for the protection of cultural as well as natural resources, the cultural resources must be addressed in this management plan on an equal footing with the natural resources. Vail & Vickers' cattle operation is the last remaining culturally active feature on any of the Park islands, and thus by mandate should be protected under the law.
- A. *Protection of cultural resources is fully addressed in the RMP/EIS. In addition to the ranch and commercial hunt operation, the cultural resources of Santa Rosa Island include thousands of archeological sites, early European exploration, fishing camps and shipwrecks, and military uses of the island.*

The Channel Islands National Park was authorized by Congress to protect a myriad of natural and cultural resources. It is clear from the legislation establishing the park, that the NPS must manage the islands in a manner to conserve the most significant of its resources. The park's General Management Plan includes provisions for continuation of a demonstration ranch of approximately 800 acres. This provides for continuity and interpretation of this portion of the cultural history, while better protecting and restoring the important cultural and natural resources on the remainder of the island.

- Q. The current ranch operation has altered practices over time and does not reflect any single type of historical ranching culture. Since ranching represents less than 2% of the documented time of human occupation on Santa Rosa Island, interpretation of the livestock operation should not take precedence over interpretation of the other 98% of human occupation, which included Chumash and earlier native Americans.

RESPONSE TO PUBLIC COMMENTS

- A. *The preferred alternative, in conjunction with the park's General Management Plan, provides the best balance of protection for the many significant resources which the park was set aside to protect.*
- Q. Would the proposal to nominate Santa Rosa Island to the National Registry of Historic Place impact management of natural resources?
- A. *No. There should be no impact on the management of natural resources. All the other islands within the Park are listed on the National Register as archeological districts and there is no problem with managing natural resources as a result of this designation. The National Register nomination is currently in rough draft.*

Issue: Knowledge of Archeological Resources on Santa Rosa Island

Comment Letters: National Parks and Conservation Association

- Q. Overall, the archeological resources on Santa Rosa Island are poorly known and more information is needed in order to determine the actual benefits and detriments associated with each alternative.
- A. *It is true that there is much information yet to be learned about the archeological resources of Santa Rosa Island. The Park has made considerable headway in surveys to locate archeological sites and identify those sites which are most in danger of loss to erosion. To date, 35% of the island has been surveyed by archeologists, who have recorded over 450 sites. Several studies are at or near the publication stage. Over 70 new radiocarbon dates have been derived from Santa Rosa Island in the last ten years.*

There is sufficient information available to make an informed determination of the likely effects of various management alternatives on archeological resources.

Issue: Impacts to Archeological Sites

Comment Letters: Natural Resources Conservation Service, Elizabeth L. Painter

- Q. Isn't it true that humans have had a far greater impact on archeological sites than cattle have had?
- A. *There have been extensive, direct alterations to archeological sites from both cattle and humans. Additionally, some of the impacts to archeological sites, such as accelerated erosion due to removal of vegetation, reflect the indirect impacts of humans, cattle, and sheep. Currently, there are few instances of human disturbance to archeological sites on the island. There are no cases of pothunting undertaken by Park visitors; the Park is continuously educating people regarding the legal protection of archeological sites. Disturbance by cattle continues; however, this is probably not as significant as in the past because after the initial grinding of archeological materials in the upper layers of archeological sites, the process of disturbing new materials is slower.*

RESPONSE TO PUBLIC COMMENTS

- Q. Disruptive influences of trampling may be particularly important where management practices permit livestock to achieve high concentrations. Therefore, spatial disruption of artifacts may increase under alternatives C and D.
- A. *The proposed action, Alternative D, does not contain the rotational grazing program that would concentrate cattle in North Pasture.*

Issue: Impacts to Historic Structures

Comment Letters: Santa Cruz Island Foundation, D. Chris Jones

- Q. Although the Draft RMP/EIS states that under Alternatives A-E there would be no effect on historic structures or the surrounding historic preservation area, this is not true. Any alteration of Vail & Vickers' operation would have an impact on the historical resources of Santa Rosa Island. These impacts must be determined and taken into consideration.
- A. *The impacts of the various alternative in the RMP/EIS on historical resources were determined and taken into consideration in the decision-making process. Because the Park intends to maintain a demonstration ranch centered upon the Beecher's Bay Ranch, it is correct that the alternatives discussed in that document will not have an effect on historic structures or the surrounding historic preservation area.*

Issue: Impacts to Cultural Landscapes

Comment Letters: Santa Cruz Island Foundation

- Q. The entire island should be defined as the "surrounding historic landscape".
- A. *The Channel Islands National Park was authorized by Congress to protect a myriad of natural and cultural resources. The Channel Island's General Management Plan (GMP) determined the management zoning for Santa Rosa Island through a process of park planning and public comment and review. This resulted in designation of an area in the vicinity of the Beecher's Bay ranch complex as the "Preservation/Adaptive Use" zone, referred to in the RMP/EIS as the "historic landscape preservation zone". There are numerous significant cultural resources outside of this zone which will also be protected. The preferred alternative provides for protection of the significant natural and cultural resources which the park was set aside to protect. A cultural landscape study will determine the portion of the island to be designated as a "cultural landscape".*
- Q. The term "cultural landscape" needs to be defined.
- A. *The NPS Cultural Resources Management Guidelines define a "cultural landscape" as "...a geographic area, including both natural and cultural resources, associated with a historic event, activity, or person."*
- Q. The term "prehistoric landscape" is invented and is inappropriate for use in the RMP/EIS.

RESPONSE TO PUBLIC COMMENTS

- A. The term “prehistoric landscape” is very appropriate to describe the landscape appearance and processes of the islands prior to the creation of the historic vernacular landscape of the ranch era.

Issue: Impacts to Ethnographic Resources

Comment Letters: Santa Cruz Island Foundation

- Q. The term “ethnography” is applied incorrectly in the document and with bias to include only descendants of Chumash Indians. Ethnography, the systematic recording of human cultures, necessarily includes the ranching traditions of Santa Rosa Island. A cultural anthropologist should be employed to study the cultural values represented by the descendants of 138 years of continuous island ownership and occupation.

- A. *It is correct that the term “ethnography” can be applied to all cultures. The NPS Cultural Resource Management Guidelines define ethnographic resources as:*

...basic expressions of human culture and the basis for continuity of cultural systems. A cultural system encompasses both the tangible and the intangible. It includes traditional arts and native languages, religious beliefs and subsistence activities. Some of these traditions are supported by ethnographic resources: special places in the natural world, structures with historic associations, and natural materials.

We agree with commenter’s desire to have additional studies of the ranching traditions of Santa Rosa Island. Limited funds and competing needs has prevented the NPS from funding this endeavor. The Santa Rosa Island Foundation, a private non-profit group, has begun such work with the ranch families.

Issue: Demonstration Ranch/Living History Museum

Comment Letters: Santa Cruz Island Foundation, Elizabeth L. Painter

- Q. The concept of a living history museum should be included in the RMP/EIS.
- A. *We assume that the term “living history museum” refers to the demonstration ranch at Beecher’s Bay. The draft RMP/EIS (p. 13) identifies a demonstration ranch at Beecher’s Bay, with a small number of cattle and horses, as a component of all the alternatives addressed in the plan.*
- Q. The Park’s GMP calls for an 800 acre demonstration ranch at Beecher’s Bay. Would choosing Alternative E (Immediate Removal) preclude this possibility?
- A. *No. Under all the RMP/EIS alternatives the park will manage a demonstration ranch at Beecher’s Bay.*

Deer/elk Management

Issue: Justification for Retaining Elk Herd

Comment Letters: California Native Plant Society (Roberson), Multiple Use Managers, Inc.

- Q. Since NPS guidelines for natural resources management require eradication of alien species which threaten to alter natural ecosystems or restrict or prey on natural populations, complete eradication would seem to be the only appropriate option for management of this species. Because this is not the management strategy chosen for the Preferred Alternative, the RMP/EIS should justify the proposed retention of a viable population of elk on Santa Rosa Island.
- A. *The final Preferred Alternative proposes phased reductions in elk over the next 14 years. Elk will be removed at a faster rate in the initial years in order to lessen impacts to native habitats and rare plant species. All elk will be gone from Santa Rosa Island by the end of 2011. Alternative D, the Proposed Action, therefore does not propose retention of a “viable herd”.*
- Q. A herd of approximately 750 elk, with the majority of them being bulls, could be maintained until the year 2011 with little or no impact on the environment.
- A. *The elk have been documented to cause impacts to native habitats and rare plant species. The consensus of a team of biologists from the NPS, U.S. Fish and Wildlife Service, and the USGS Biological Resources Division, who are knowledgeable with the resources of Santa Rosa Island, was that the elk are causing degradation of park resources and that numbers needed to be significantly reduced.*

The final Proposed Action proposes phased reductions of elk over the next 14 years. The duration of the commercial hunt operation and the manner of removal of the elk will be at the discretion of Vail and Vickers. It is conceivable that they will continue their current operation through 2011.

Issue: Removal and Management Methods for Deer and Elk

Comment Letters: U.S. Environmental Protection Agency, Multiple Use Managers, Inc., Vail & Vickers, Gary M. Fellers

- Q. The RMP/EIS should discuss possible removal methods for deer and elk.
- A. *The deer and elk are the private property of Vail and Vickers, the former owners of Santa Rosa Island. The NPS will not make decisions regarding how V&V handles their property. The Special Use Permit which will be issued to V&V by the NPS will include provisions to ensure that V&V removal operations will not cause unacceptable harm to park resources or interference with visitor uses of Santa Rosa Island.*
- Q. The RMP/EIS should discuss the potential for disease transmission from deer and elk relocated from Santa Rosa Island to the mainland.

RESPONSE TO PUBLIC COMMENTS

- A. *The deer and elk are the private property of Vail and Vickers, the former owners of Santa Rosa Island. They are responsible for evaluating all issues with removal of their animals to the mainland.*
- Q. Implementation of the removal schedule proposed in the Preferred Alternative is physically impossible.
- A. *We believe that the removal schedule in the proposed action (Alternative D, Revised Conservation Strategy) is achievable. That schedule calls for Vail & Vickers to remove approximately 250 deer per year, and 50 to 100 elk. The park will work with Vail and Vickers to ensure that they are able to meet the schedule.*
- Q. Implementation of the removal schedule proposed in the Preferred Alternative would result in negative publicity for Vail & Vickers and NPS. There are limits on the ability to commercially capture and sell live deer (as opposed to elk where that opportunity exists). The mortality associated with capture and transport of deer is high. Widespread killing of doe and yearling deer would bring on a public outcry.
- A. *Channel Islands National Park was established to protect the unique natural and cultural resources of the islands and surrounding marine waters. Non-native mule deer on Santa Rosa Island cause more degradation to unique native plants than any other single factor. The NPS will work with the Vail and Vickers, as well as the public, to ensure that there is widespread understanding of the reasons why deer must be removed from the island.*
- Q. Deer should be managed by eliminating them from key areas where there are rare plant concerns. It would be possible to keep these areas deer-free, since deer have relatively small home ranges and are not aggressive when it comes to invading new territory. These areas could be periodically checked and deer removed.
- A. *The deer are browsers and occur almost entirely in native woodland and shrubland habitats. These habitats, which contain most of the rare species on Santa Rosa Island, have been highly degraded and restricted in size. Because deer occur almost entirely within sensitive habitats, it is necessary to remove all of the deer in order to protect these habitats.*
- Q. Alternatively, the deer removal program should be long-term and directed primarily at does. The deer could be reduced by 2/3 within 8 years, then eliminated by 2011.
- A. *Alternatives similar to this were considered by the Park. This much slower removal was not selected due to the considerable impacts by deer on native habitats (especially chaparral, coastal sage scrub, Santa Cruz Island Pine woodland, mixed woodland, riparian woodland and lupine scrub), on proposed plant species (especially *Arctostaphylos confertiflora*, *Castilleja mollis*, and *Heuchera maxima*), and on numerous rare plant species.*
- Q. It is illogical to manage the elk herd at a population level of 450, which is what the herd was reduced to during severe drought conditions.
- A. *The final preferred alternative does not include managing the elk herd at a population level of 450 animals. The elk will be phased-out over a 14 year period.*

- Q. NPS should consider removal of the elk within three years.
- A. *The NPS did consider an alternative similar to this (see Alternative E, Immediate Removal of Ungulates).*

Ecosystem Management

Issue: Application of Ecosystem Management Principles to Santa Rosa Island Management

Comment Letters: Range Watch, Stephen Blakely, Paul M. Bryant, Charles Chubb, Mimi Chubb, Lynn R. Cornelius, Shirley N. DiCroce, Brenda B. Dyer, Susanne K. Filkins, William F. Halpin, Gerry Hurst, Randy Kahn, Shelly A. Kroll, Melville Mackler, Corenne McKinley, Elizabeth L. Painter, Denise Ruderman, Christine M. Simpson, Barbara Stoddard, Sybil W. Stoller, Ned W. Stone, Mary P. Thobe, Gene Tuck, Debra L. Turner

- Q. Rather than taking an ecosystem management approach, the RMP/EIS addresses only the two issues (water quality and rare species) that the Park is legally forced to address. An ecosystem management approach would have proposed measures to reduce livestock impacts to soils and soil crusts, and would have attempted to improve the health of all the island's native plant communities.
- A. *The NPS has revised the preferred alternative in a manner that will improve increasing portions of the island's native plant communities over the next 14 years as commercial grazing and hunting are reduced. The areas of the island with the most sensitive resources were prioritized for the most rapid removal of non-native ungulates and restoration of resources. Reduction of cattle, horses, deer and elk comprises an ecosystem-level approach to island management.*
- Q. There is no discussion of impacts to ecosystem structure or function related to livestock herbivory. Ecosystem function may be altered through changes in nutrient cycles, hydrologic cycles, etc. Ecosystem structural alterations can include changes in vegetation stratification, loss of living and dead plant cover, loss of cryptobiotic soil crusts, loss of mycorrhizal fungi and other soil organisms, increases in soil compaction, loss of soil stability, increased erosion, etc.
- A. *We agree that the alterations that livestock cause to ecosystems are pervasive. We believe that the RMP/EIS addresses the key indicators of ecosystem change in sufficient detail to allow the public to intelligently comment on the plan and to allow the NPS to make an informed decision regarding management of Santa Rosa Island.*

Fire Management

Issue: Restoring Natural Fire Regimes

Comment Letters: California Native Plant Society (Roberson)

- Q. The Final RMP/EIS should contain proposals to investigate and/or restore natural fire regimes on Santa Rosa Island. If investigations show that burning is needed, a prescribed fire program should be initiated. The program should be implemented in pastures that are closed to grazing, or pastures should be closed temporarily to grazing (for 2-3 years) to allow prescribed burning to be implemented.
- A. *The NPS does intend to use fire as a tool to restore native ecosystems. The only prescribed burn that has been planned is a 600-acre burn in Old Ranch Pasture (currently closed to cattle) for the restoration of native grasslands. We will evaluate the results of this burn prior to testing prescribed burns in other pastures.*

Issue: The Effect of Fire on Shrub Species

Comment Letters: California Cattlemen's Association

- Q. What is the frequency of fire on Santa Rosa Island, and has this caused a measurable decrease in shrub species?
- A. *The Park has initiated a fire history study of the northern Channel Islands, with results expected in 1998. Some dating of charcoal from prehistoric fire events has occurred. It is impossible to determine, however, whether those prehistoric fires were natural or human starts. Additionally, occurrence and frequency of lightning strikes of the islands during recent years have been studied. Lightning is known to strike the islands on occasion, but at a lower frequency than on the mainland.*

Two Santa Rosa Torrey Pines, approximately 275 years old, were cored to date fire scars. They showed five and six fire scars each before the year 1860 and none thereafter. The average fire intervals for these two trees were 17 and 28 years for the pre-ranch period.

Much remains to be learned about the natural frequency of fire and the use of burning by the Chumash on Santa Rosa Island. It appears, however, that fire is less frequent on Santa Rosa Island now than it was prior to 1860. This situation would tend to favor the spread of shrub communities, rather than lead to a decrease. The decrease in the extent of shrublands is due to the introduction of non-native ungulates.

Issue: The Effect of Livestock on Fire Regimes

Comment Letters: Multiple Use Managers, Inc.

- Q. If grazing is eliminated, the chance of major fire would increase dramatically. Fires would be more difficult to maintain, due to lots of dry grass and increased accumulation of litter.

- A. *Fire is a natural and necessary process of the ecosystem on Santa Rosa Island. Nevertheless, there are resources, particularly structures, that the NPS has identified as needing protection from fire. The NPS will use fire as a tool to reduce fuel hazards near structures and to restore natural processes. The NPS maintains a fire cache and trained fire fighting personnel on the island and the mainland.*

Geological Resources

Issue: Geologic Descriptions of Santa Rosa Island

Comment Letters: Santa Rosa Chapter, Santa Cruz Island Foundation

- Q. It is not true that “the bedrock north of the fault is made up largely of rocks of tertiary age”. The uncapitalized Tertiary has no meaning in geology.
- A. *This change has been incorporated into the Final RMP/EIS.*
- Q. It is not true that the Transverse Ranges are much the same as Santa Rosa Island. The rocks on the island are essentially unrelated to those in the rest of the Transverse Range.
- A. *This change has been incorporated into the Final RMP/EIS.*
- Q. It is not true that the rocks south of the Santa Rosa Fault are “more volcanic” than those north of the fault. There are volcanic rocks south of the fault, but they also exist north of the fault. The bedrock south of the fault is dominantly sandstone, shale and conglomerate of Eocene through Miocene age, and those rocks are unrelated to the volcanics.
- A. *This change has been incorporated into the Final RMP/EIS.*

Issue: Geologic Processes on Santa Rosa Island

Comment Letters: Elizabeth L. Painter

- Q. The Draft RMP/EIS concludes that the deeply incised nature of many of the stream reaches on Santa Rosa Island is probably the result of thousands of years of development of arroyo systems,. However, recent studies of sediment accumulation indicate that arroyo development is the result of post-settlement livestock impacts.
- A. *More study is needed to determine the history of the arroyo systems on Santa Rosa Island.*

Goals and Objectives

Issue: Overall NPS Management Goals for Santa Rosa Island

Comment Letters: U.S. Fish and Wildlife Service, California Native Plant Society (Roberson), National Parks and Conservation Association

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Q. The stated goals and objectives of the RMP/EIS are not reviewed in the broader context of NPS management goals for Santa Rosa Island. Specifically, is one of NPS' goals to maintain a ranching operation on Santa Rosa Island? If this is a goal of the RMP/EIS, it should be stated as such. This goal, however, would appear to be in conflict with other stated goals of the RMP/EIS, as well as with several federal laws.

A. *The broad management goals for Santa Rosa Island are set forth in the park's General Management Plan. The purpose of the RMP/EIS is more narrow in scope, and the RMP goals are described in the Purpose and Need chapter. Maintaining a commercial ranching operation of Santa Rosa Island is not one of NPS' goals. However, the Park does have a long-term goal to maintain a demonstration ranch in the historic landscape preservation zone in Beecher's Bay.*

Q. The current Plan places the goal of livestock production before enhancement and protection of Santa Rosa Island's resources.

A. *The RMP/EIS presents a range of alternatives. Under the proposed action in this Final RMP/EIS, non-native ungulates are reduced in a manner which will protect the resources of the island. Other alternatives have different impacts on island resources.*

Q. The RMP/EIS should more fully explain how the overall management goals for Santa Rosa Island were affected by the former owners' decision not to reserve a right of use and occupancy for the entire island, and the fact that NPS did not enter into a lease agreement with the former owners for continuation of existing uses.

A. *Discussions of decisions which did not happen would be beyond the scope of the RMP/EIS. See answers to questions under Ownership and Management of Santa Rosa Island.*

Q. Given the enabling legislation, shouldn't continuation of the ranching operation be among the Plan Goals and Objectives?

A. *The enabling legislation does not direct the Park to continue the ranch and hunting operation. However, as described in the Park's general management plan (1985), the Park plans to develop an 800 acre demonstration ranch at Beecher's Bay to interpret the ranching history of the island.*

Issue: Adequacy of Plan and Goals and Objectives

Comment Letters: California Native Plant Society (Roberson), Rob Klinger, Elizabeth L. Painter

Q. The stated goals and objectives of the RMP/EIS are inadequate. No desired plant communities, or other specific ecosystem goals, are described. No monitoring programs are proposed to provide timely feedback.

A. *The scope of the RMP/EIS does not encompass all possible actions and management goals which the NPS has in the management of Santa Rosa Island. Many of the broader issues are*

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addressed in the Park's general management plan (GMP). The RMP/EIS is tiered from the GMP. The RMP/EIS must be consistent with that document as well as the Park's enabling legislation and other applicable laws.

- Q. The Final RMP/EIS should adopt the Draft Conservation Strategies recommendations for Desired Future Conditions, Interim Goals, and Standards.
- A. *The final Preferred Alternative is adopted from the Conservation Strategy Team's management recommendation. Although implementation of the Proposed Action in this Final RMP/EIS will result in considerable progress toward the goals set forth in the Draft Conservation Strategies, NPS cannot afford to monitor all ecosystem elements necessary to record achievement of those goals. Therefore, those goals are not incorporated into this final plan.*
- Q. There are no objectives for the stated goal to "ensure that alien species will not threaten restoration of rare species and their habitats".
- A. *The Park will continue monitoring of all proposed species, many rare species, and all vegetation communities. Additionally, the Park will begin removal of alien species that are threatening proposed species. Phased reduction of non-native ungulates from Santa Rosa Island is the most significant step that the Park is taking to ensure that native species and habitats are better able to compete with alien species.*
- Q. The objectives for habitat types should be more quantifiable. For each vegetation unit, NPS managers should establish as a goal a desired plant community. Since undisturbed sites for comparison with disturbed sites are scarce, any such areas must be protected immediately from livestock. Since alien-dominated grasslands are not a natural community, they should not be chosen as a desired plant community.
- A. *NPS cannot afford to monitor all ecosystem elements necessary to record achievement of such goals as desired plant communities. Therefore, such goals are not incorporated into this final plan.*
- Q. The objective for water quality is not quantifiable. Natural resources management guidelines for NPS (NPS-77) require quantifiable objectives. The objective should be made quantifiable, or the RMP/EIS should state that quantifiable standards mutually agreed upon by NPS and Central Coast Regional Water Quality Control Board will be applied. If sediment transport is an identified problem, why is it not included in the objective? Will NPS attempt to meet the objective only in selected pastures and streams? For protection of both visitors and park personnel, safe water should be the objective for all watersheds and wetlands.
- A. *The Central Coast Water Quality Control Board is not requiring NPS to meet specific quantifiable standards. By this Proposed Action, NPS is complying with the existing Cleanup or Abatement Order by a phased approach that will remove impacts to island surface waters.*
- Q. The objectives for riparian areas are not quantifiable. Desired future condition, interim goals and interim standards for riparian areas from the Conservation Strategies Document might be used in the interim.

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- A. *Although implementation of the Proposed Action in this Final RMP/EIS will result in considerable progress toward the riparian area goals set forth in the Draft Conservation Strategies, NPS cannot afford to monitor all ecosystem elements necessary to record achievement of those goals. Therefore, those goals are not incorporated into this final plan*

Grazing Management

Issue: Grazing Management Goals for Santa Rosa Island

Comment Letters: National Parks and Conservation Association

- Q. The current Range Management Plan is designed for the management of an alien-grass dominated grassland on privately owned ranches where the goal is to maximize livestock production and profits while minimizing impacts to forage productivity. This approach is inappropriate for Santa Rosa Island, since Santa Rosa has no natural annual-dominated grasslands, and is not privately owned. National Parks should not be managed to maximize livestock production or profits, but rather to minimize impacts to natural resources while promoting public access.
- A. *The final Proposed Action was developed to meet the requirements of NPS law and appropriate legislation and regulations. The goal of the chosen alternative is to protect rare plant species and their habitats and improve water quality island-wide. The final Proposed Action meets these goals within the framework of an orderly phase-out of non-native ungulates from Santa Rosa Island.*

Issue: Establishment of a Grazing Fee for Santa Rosa Island

Comment Letters: Natural Resources Conservation Service, Natural Resources Defense Council, Craig Dremann, Elizabeth L. Painter, Lynne Sherman, David and Lisa Smith

- Q. What was the formula used by NPS to determine the current grazing fee paid by Vail & Vickers?
- A. *The grazing fee was based on a determination of the fair market value of the Special Use Permit. Determination of the grazing fee is outside of the scope of the RMP/EIS.*
- Q. The grazing fee for Santa Rosa Island is lower than heavily subsidized fees charged to graze other federal lands. In fact, it is the lowest grazing fee charged anywhere in the U.S. The Park Service attempts to justify this low fee as offsetting the costs of transporting cattle to and from the island, but the grazing permittee, not the taxpayers, should bear this cost. The effect is that the public has been forced to underwrite the commercial activities of the permittee.
- A. *The grazing fee was based on a determination of the fair market value of the Special Use Permit. Determination of the grazing fee is outside of the scope of the RMP/EIS.*

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- Q. Does Vail & Vickers pay grazing fees only for cattle, or for deer, elk and horses as well?
- A. *Under the previous Special Use Permits, Vail and Vickers paid grazing fees for cattle, deer and elk use of the island. Under the Special Use Permit that will be issued following release of this Final RMP/EIS, Vail and Vickers will pay grazing fees for cattle, horse deer and elk use of the island.*
- Q. NPS-77 guidelines for natural resources management state that the government expects to get “fair market value” when it establishes fees for the use of resources. Fair market value reported by USDA and USDI for western public rangelands was \$6.84 per AUM. However, NPS established a rate of \$1.00 per AUM because it subtracted costs associated with operating an offshore cattle ranch. NPS should not subtract these costs from the grazing fees. These are the costs of operating an unusual commercial enterprise, and it is not the responsibility of the public to offset them.
- A. *All costs which would be incurred by a permittee to carry out a special use within a park are factors used in calculating the fair market value of that use.*
- Q. If NPS actually obtained fair market value for grazing on Santa Rosa Island, it may actually receive more funds than what it currently spends on the operation
- A. *Analysis of the costs of the island management are beyond the scope of the RMP/EIS.*

Issue: Proposed Changes to Grazing Management Practices

Comment Letters: Vail & Vickers

- Q. The Park should construct additional exclosures, beyond that number proposed in the Draft RMP/EIS, and should place them so as to maximize benefit to riparian restoration and protection. One or two of the exclosures should be enlarged to riparian pastures where grazing would be allowed on a limited basis. Such grazing could be for a set time period or a set usage or a set stubble height. A riparian pasture should be established in Quemada Canyon.
- A. *The Park considered alternatives similar to that proposed for protection of riparian habitats. The final Proposed Action protects riparian habitats primarily through the exclusion of cattle from riparian areas using existing pasture fencing and reduction of cattle numbers.*
- Q. In Lobo Canyon NPS should extend the existing exclosure upstream to the road, and develop an off-line cattle water facility.
- A. *The Park considered an option similar to that proposed for protection of Lobo Canyon. The final Proposed Action protects Lobo Canyon through reduction of cattle numbers, removal of deer, and phase-out of elk.*

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- Q. In Lobo Canyon NPS should construct a fence to eliminate cattle use of the lower part of the canyon.
- A. *There is currently a fence which excludes cattle from the lower part of the canyon. This fence will remain in place until 2008 when cattle are entirely removed from the pasture.*
- Q. Old Ranch Pasture should be grazed on a seasonal basis, from September 1st to March 31st. This would avoid impacts to plovers during the nesting season. It would allow green-up in the winter prior to grazing, and would allow seed set and seed desiccation in early Spring.
- A. *The Park considered this option for Old Ranch Pasture. It was not chosen for further consideration in the RMP/EIS because of the presence of several rare plant species, native habitats, the coastal marshes, and a non-functional riparian corridor. The NPS determined that these resources require year-round exclusion of cattle to prevent adverse impacts.*

Issue: Impacts of Grazing Management Practices

Comment Letters: U.S Environmental Protection Agency, California Native Plant Society (Roberson), National Parks and Conservation Association, Elizabeth L. Painter

- Q. The RMP/EIS should recognize the Council on Environmental Quality (CEQ) memorandum (1/29/93 Federal Register) on incorporating pollution prevention features in Federal NEPA documents. The RMP/EIS should include such measures as apply to rangeland management and road management and non-point source pollution prevention.
- A. *The Final RMP/EIS has incorporated best management practices for rangeland management, such as pasture closures, reduction of stocking levels, and construction of riparian exclosures. The plan also incorporates as mitigation measures the best road management practices identified by the Central Coast Water Quality Control Board as terms and conditions of the water quality certification for maintenance of road stream crossings. These measures achieve pollution prevention goals.*
- Q. Although stocking rate is the most powerful tool available to range managers to reduce grazing impacts, stocking rate will not change substantially over most of Santa Rosa Island under any alternative other than E (Immediate Removal). Neither would cattle management change significantly. As a result, cattle would continue to graze season-long in many areas, and damage to riparian areas and other highly impacted areas would be exacerbated.
- A. *We believe that the final Proposed Action answers many of the concerns expressed in this comment. Under this alternative, the stocking rate is progressively decreased over the next 14 years. The pastures with the greatest concentration of sensitive resources were prioritized for the most rapid reduction of grazers. Season-long grazing will continue in areas where cattle are permitted to remain.*
- Q. The proposed split of North Pasture and implementation of a six-month seasonal grazing schedule will increase cattle-related grazing impacts through overgrazing.

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A. *We agree that the proposed split of North Pasture had the potential for exacerbating some impacts to rare plants and habitats. As a result, this action was removed from Alternative D, the final Proposed Action.*

Q. There has been a history of cattle trespass into fenced areas (Lobo Canyon, snowy plover enclosure) on Santa Rosa Island. The Draft RMP/EIS does not acknowledge this, nor does it propose measures to deal with trespass cattle.

A. *We agree that cattle trespass has been a problem in some newly fenced enclosures. The final Proposed Action does not rely extensively on the construction of enclosures to protect resources. Cattle exclusion is primarily based on existing pasture fences. We believe that these fences will be highly successful in containing cattle.*

The Proposed Action does provide for two small enclosures to protect riparian resources in pastures which will remain open to cattle until 2011. A “defensible” fence line will be chosen. The NPS and Vail & Vickers will monitor the fencelines to ensure that cattle do not enter the enclosures.

Q. The Draft RMP/EIS propose no measures to address the problem of salt block placement near water, though there have been numerous occasions of salt blocks being placed within ¼ mile of water since 1993.

A. *The NPS will continue to require that salt and molasses blocks be placed at least ¼ mile from water sources. The park notifies Vail & Vickers when they are in violation and requires that the blocks be moved.*

Q. If cattle displaced by pasture closures are put in other pastures, this increased stocking density could lead to further degradation in those other pastures.

A. *We agree. The final Proposed Action provides that as pastures are reduced or closed, those AUM’s will be subtracted from the total island allotment of AUM’s.*

Issue: Management of Horses

Comment Letters: U.S. Fish and Wildlife Service

Q. The RMP/EIS contains no management measures for horses.

A. *Horses are managed in conjunction with cattle. Vail & Vickers can decide how they wish to distribute horses between the pastures which remain open to livestock.*

Q. The RMP/EIS states that the number of horses allowed in Old Ranch Pasture will be set at a maximum, but it doesn’t specify the maximum. Effects of horses on natural resources would be dependent upon the number of horses that remain in the pasture.

A. *In the final Proposed Action horses are not allowed in Old Ranch Pasture.*

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- Q. Removal of the existing herd of brood mares (15-20) from Old Ranch Pasture is unnecessary, because they never leave the high country or go to the western snowy plover nesting areas. Removal of the horses would affect Vail & Vickers' breeding program and animal safety.
- A. *The western snowy plover is not the only Park resource in need of protection. For example, the horses impact the pasture wetlands (habitat for the very rare species *Lasthenia glabrata* var. *coulteri*) and the rocky outcrop which is the only known location of *Dudleya blochmaniae* ssp. *insularis*. Removal of the horses will be a change in the Vail & Vickers operation but the horses may be moved to another pasture which is open to livestock.*

Issue: Calculation of Grazing Capacity for Santa Rosa Island

Comment Letters: U.S. Fish and Wildlife Service, National Parks and Conservation Association, Elizabeth L. Painter

- Q. The RMP/EIS should explain how grazing capacities for different pastures were developed, and define the "scorecard" method.
- A. *See Appendix B, Recent History of Livestock Use of Santa Rosa Island.*
- Q. Island-wide available AUM's were determined by Bartolome and Clawson in the 1992 Range Management Plan, but were to be replaced by GIS-developed models when available. This has not been done. Therefore, the estimate of available AUM's (41,102) is not accurate. Estimates of reductions of AUM's in the RMP/EIS should therefore be based on actual monitoring data.
- A. *The "scorecard" estimates were validated by a subsequent GIS analysis. See Appendix B, Recent History of Livestock Use of Santa Rosa Island.*
- Q. Grazing capacity should be recalculated using appropriate reductions for slope, since livestock generally avoid steep slopes and prefer to use more accessible areas.
- A. *Those factors were taken into consideration in both the scorecard analysis and subsequent GIS analysis. See Appendix B, Recent History of Livestock Use of Santa Rosa Island.*
- Q. Since actual use numbers are not available, actual yearly forage demand may not be less than that estimated by Bartolome and Clawson in the Range Management Plan. Bartolome and Clawson determined that forage demand by horses and deer was not significant, but horses and deer do in fact have a significant effect on habitat, vegetation and forage. This contradicts NPS statements in the RMP/EIS that the island is not overstocked.
- A. *Actual stocking rates are comparable to those recommended by Bartolome and Clawson. See Appendix B, Recent History of Livestock Use of Santa Rosa Island.*
- Q. All areas containing habitat for rare plant taxa should be excluded from "available" plant resource calculations. Palatability of different species should also be considered, as well as season. Some of the annual grasses should only be considered as forage during the growing season, because they have low quality and palatability when mature.

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- A. *The phased reduction of stocking levels islandwide (see Table 9) will take care of these concerns. Until 2008, only South Pasture will be stocked at current levels. However, this pasture does not contain the same degree of sensitive resources as found in other pastures.*
- Q. Estimations of reductions in AUM's should be based on actual monitoring data, not on Bartolome and Clawson's estimates, which are flawed.
- A. *Actual stocking rates are comparable to those recommended by Bartolome and Clawson. See Appendix B, Recent History of Livestock Use of Santa Rosa Island.*

Issue: Use of Residual Dry Matter (RDM) to Manage Grazing

Comment Letters: U.S. Fish and Wildlife Service, California Cattlemen's Association, National Parks and Conservation Association, Santa Rosa Chapter, Santa Cruz Island Foundation, Vail & Vickers, James W. Bartolome, John Vickers Crawford and Nancy Vickers Crawford, D. Chris Jones Elizabeth L. Painter

- Q. Methods used to calculate RDM are faulty. Data collected are entirely subjective because the monitored quadrat plots that are clipped for actual biomass depend on subjective judgment of the observer. Total pasture RDM estimates are based on clipped biomass from non-randomly placed quadrats from an inadequate number of sites per pasture, with number of sites only loosely related to pasture size.
- A. *Use of RDM is an accepted range management tool. The Park's implementation of RDM has been, and will continue to be, in accordance with acceptable guidelines for its use. Under the preferred alternative, NPS will undertake additional monitoring of water quality, riparian areas, and rare species.*
- Q. The existing monitoring protocol does not account for patchy use of pastures by cattle. It assumes pastures are more or less homogeneous and there is uniform distribution of forage resources. It thus does not account for areas with greater or lesser livestock predation than the sampling sites. It treats all biomass collected as available forage, whether or not that material is palatable or being used. It assumes the entire pasture is grassland. It does not monitor other vegetation types and thus fails to provide information about the most sensitive or heavily used resources.
- A. *Use of RDM is an accepted range management tool. The Park's implementation of RDM has been, and will continue to be, in accordance with acceptable guidelines for its use. More importantly, RDM will not be used exclusively to set pasture stocking levels. Those have been set (Table 9) according to known impacts to water quality, riparian areas, rare species, and native vegetation.*
- Q. Current analysis procedures by NPS regarding RDM data allow for considerable error. Statistical probability is set at 0.20. Sample sizes are problematic; statistical analysis for adequacy of sampling size revealed that sample size (number of sites per pasture) was inadequate for three of four pastures. RDM analysis has little predictive power, and SRI data are insufficient to predict how many animals can be sustained in each pasture.

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- A. *Use of RDM is an accepted range management tool. The Park's implementation of RDM has been, and will continue to be, in accordance with acceptable guidelines for its use. RDM is not applied as a research investigation, and data collected are not intended for eventual publication in peer-reviewed scientific journals. More importantly, RDM will not be used exclusively to set pasture stocking levels. Those have been set (Table 9) according to known impacts to water quality, riparian areas, rare species, and native vegetation.*
- Q. The forage monitoring protocol assumes that there is uniform livestock utilization. This is not true.
- A. *On the contrary, the Park recognizes that the primary problem, resource-wise, with the Santa Rosa Island cattle ranching operation is the patchy distribution of cattle. The forage monitoring program is being de-emphasized, and will only be used to adjust stocking levels in drought years.*
- Q. Location of monitoring sites is not representative of pastures or cattle utilization of pastures. The sites are currently in non-native grasslands, are all at least ¼ mile from water, and are on slopes less than 25%.
- A. *Locations of forage monitoring sites will be reviewed.*
- Q. What will be the fate of cattle that are removed from a pasture once the minimum RDM level has been exceeded?
- A. *They must be relocated to another pasture in which allowable AUM's and RDM have not been exceeded.*
- Q. The factors of weather and slope were omitted from determination of proper utilization and acceptable RDM levels.
- A. *The new minimum RDM, 1,000 lb./ac, applies to all slope categories. Rainfall has not been used as a factor in setting this minimum RDM level. The Park desires this level of protection for island soils in both normal and drought years.*
- Q. Current minimum RDM levels are appropriate for Santa Rosa Island. An increase to 1000 lb./ac is not based on ranges with similar feed, topography or climatic conditions, and would be detrimental to the rangeland ecosystem. Too much RDM can stifle next year's growth and choke out many desirable plants.
- A. *In order to protect island soils, the Park desires the level of protection conferred by a minimum RDM of 1,000 lb./ac. The ranch operation has met these levels in many areas since the Park began monitoring RDM in 1993. This has not been detrimental to the rangeland ecosystem.*
- Q. Other Federal agencies have set RDM standards that would be appropriate for managing grazing at Channel Islands National Park. The U.S. Forest Service Rangeland Analysis Field Guide and the Bureau of Land Management Bakersfield District Standards for Rangeland

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Health should be consulted. The forage guides of these Federal agencies are developed based on what is necessary or advantageous to the range and plant communities, and are not based on use of purpose of the respective agencies. Consequently, the standards are equally transferable to any other agency such as NPS.

- A. *RDM levels that are appropriate for Federal agencies with multiple-use mandates are not necessarily appropriate for NPS lands. The RDM levels used by other Federal agencies would not allow NPS to achieve the goals of this RMP.*
- Q. Although NPS has been encouraged to change livestock monitoring by the original Range Management Plan, by the Rapid Riparian Assessment Team report, and by its own Range Management Specialist, the Draft RMP/EIS proposes only to raise RDM to 1000 lb./ac.
- A. *Under the new Proposed Action, RDM monitoring will not be used exclusively to set pasture stocking levels. Those have been set (Table 9) according to known impacts to water quality, riparian areas, rare species, and native vegetation. Monitoring of rare species and water quality/riparian areas have been added.*
- Q. How would an increase in RDM to 1000 lb./ac result in benefits to the island, when recent RDM has generally never fallen below 1000 lb./ac?
- A. *Under the current program, the ranch has only to meet a minimum RDM standard of 400 lb./ac. Raising the minimum RDM standard to 1000 lb./ac ensures protection of island soils.*
- Q. The initial RDM standards were based on a goal of sustainable livestock production and now should be revised to reflect changing objectives for improving water quality, riparian habitat, and conserving rare species. This may be best accomplished by adding additional monitoring sites and revising RDM standards upwards. RDM can guide livestock management in critical habitats and riparian areas if sites are carefully located and standards are appropriate.
- A. *The RDM standards have been revised upwards. RDM will not be used to guide livestock management in critical habitats, though, because herding would come at cost to the ranch, and additional fencing is expensive, requires extra maintenance in the harsh marine environment, negatively affects other resources, and would only be in place for a decade or so. Instead, under Alternative D, NPS would implement phased reduction of stocking levels to protect rare species and critical habitats. NPS would also conduct rare species monitoring to ensure that these species are not adversely impacted by grazing.*

Issue: Proposed Rotational Grazing System

Comment Letters: U.S. Fish and Wildlife Service, Vail & Vickers, Elizabeth L. Painter

- Q. The RMP/EIS states in one place (p. 79) that the proposed rotational grazing system will be designed to fit into the existing calendar of events of the ranch, and in another place (p. 19) states that the rotation would be on a seasonal basis, keyed to climatic seasons. This apparent discrepancy should be resolved. If the rotation would be based on the existing calendar of ranch events, the RMP/EIS should discuss how these events would influence the biological recovery goals of the plan.

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- A. *The Proposed Action in this Final RMP/EIS no longer includes a rotational grazing system, due to the unacceptable impacts from such a system.*
- Q. Forage resources (range) are not divided equally between the proposed Brockway and North Pastures, and so a six-month rotation between these two pastures is overly simplistic.
- A. *The Proposed Action in this Final RMP/EIS no longer includes a rotational grazing system, due to the unacceptable impacts from such a system.*
- Q. The proposed grazing rotation would result in overstocking of both new pastures.
- A. *The Proposed Action in this Final RMP/EIS no longer includes a rotational grazing system, due to the unacceptable impacts from such a system.*

Issue: Management of Grazing in Perennial and Annual Grasslands

Comment Letters: U.S. Fish and Wildlife Service, Vail & Vickers

- Q. Annual forage ranges require different grazing management than perennial forage ranges. Annuals do not require root reserves and their vigor is unrelated to grazing. They have rapid return capability and will thrive so long as the grazing animals thrive. Thus, good cattle management will naturally result in plant species protection. Rotational grazing has no application on annual plants; reasonable year-long use is compatible with plant protection.
- A. *Non-native annual grasslands are the result of historic and recent land-use practices, have expanded at the expense of native vegetation types, and are thus not a desired plant community for the Park. Therefore, actions contained in this RMP/EIS are not designed to promote or maintain annual grasslands, but to facilitate expansion of native shrub communities and native perennial grassland.*

Issue: Standards and Guidelines

Comment Letters: California Native Plant Society (Roberson), Elizabeth L. Painter

- Q. The Final RMP/EIS should contain standards and guidelines for grazing management, including utilization limits for Santa Rosa Island plant communities or species. Standards and guidelines are essential components of grazing management on other federal lands.
- A. *Although setting utilization limits and standards and guidelines are desirable in some contexts, , the operation on Santa Rosa is not conducive to application of such grazing management concepts. Constant monitoring would be required in many critical areas, and NPS does not have the resources to conduct that level of monitoring. Once standards had been exceeded, management options would be limited. Moreover, herding would come at cost to the ranch, and additional fencing is expensive, requires extra maintenance in the harsh marine environment, negatively affects other resources, and would only be in place for a*

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decade or so. NPS believes that phased reduction of stocking levels best protects critical habitats and achieves the goals of the RMP.

- Q. The RMP/EIS should specify levels of utilization acceptable to NPS. Severe utilization of annual grasses might be acceptable, but no amount of utilization is acceptable for rare plant taxa.
- A. *NPS agrees that is desirable to greatly restrict utilization of rare plant taxa. That is why the Proposed Action prescribes rapid removal of deer, gradual removal of elk, and phaseout of cattle and horse grazing. The most critical areas are targeted first. NPS will also conduct rare species monitoring to ensure that the phased reduction rates are protective of plant taxa.*

Issue: Best Management Practices

Comment Letters: National Parks and Conservation Association

- Q. The Draft RMP/EIS fails to apply the Best Management Practices (BMP's) necessary to achieve water quality standards for all of Santa Rosa Island's waters.
- A. *The Proposed Action in this Final RMP/EIS will improve water quality island-wide through phaseout of ungulates. This is the most rapid method of achieving water quality standards and meeting the other goals of the plan.*

Issue: Alternative Water Sources

Comment Letters: Santa Barbara County Cattleman's Association, Vail & Vickers

- Q. To limit the number of cattle days in the riparian areas, water sources must be improved elsewhere: spring development, horizontal drilling, rain catchment tanks, and supplemental placement. The proposed water developments in the Preferred Alternative should be constructed immediately to spread cattle more evenly throughout North Pasture.
- A. *Construction of water developments would cause impacts to other resources, and are not required given the phased reduction of stocking levels contained in the final Proposed Action.*

Issue: Park Grazing Management Personnel

Comment Letters: California Native Plant Society (Roberson)

- Q. Currently the Park has no range conservationist on staff. How can the Park meet its range management commitments without a range conservationist on staff?
- A. *The Park has recently hired a permanent, full-time Range Management Specialist who will enter on duty May 12, 1996.*

Issue: Enforcement of Grazing Management Requirements

Comment Letters: Elizabeth L. Painter

- Q. The Draft RMP/EIS contains no information about penalties for non-compliance with grazing standards. There is apparently no cost of noncompliance and limited incentive for compliance.
- A. *The penalty for non-compliance with provisions of the Special Use Permit is revocation of the permit and subsequent impoundment of livestock by the Park.*
- Q. The Draft RMP/EIS does not contain any mechanism for rapid adjustment of stocking rate.
- A. *In an island grazing operation with large pastures, rapid adjustment of stocking rate is problematic, at best. Resources will be protected by the phased reduction in stocking rate (Table 9) and adjustment of stocking levels in drought years.*
- Q. Since actual stocking numbers are not available, actual forage demand may exceed estimated grazing capacity.
- A. *Actual islandwide stocking levels approximate the level recommended by Bartolome and Clawson in the Range Management Plan for Santa Rosa Island (1992). See Appendix A, Recent History of Livestock Use of Santa Rosa Island.*

Legal Authorities, Agency Policies, and Guidelines

Issue: Ownership and Management of Santa Rosa Island

Comment Letters: Craig Dremann, Chris L. Dryer, Zelma C. Flynn

- Q. Does the NPS have the legal authority to implement NPS policies and fully manage Santa Rosa Island's resources? Legally, how much say does Vail & Vickers have in management of the island? Since Vail & Vickers only reserved a right of non-commercial use for a limited area of the island, why do they have decision-making authority over the entire island?
- A. *The National Park Service owns Santa Rosa Island in fee and has full legal authority to implement NPS policies. The NPS has not delegated any of its management authority to Vail & Vickers. However, NPS strives to have a cooperative working relationship with Vail & Vickers.*
- Q. The Draft RMP/EIS does not mention the extinguishing of Native American land title to the island or its use; rights they may have would affect the management of natural resources. Since the eighteen treaties signed with the California Native Americans in the 1800's were never ratified, have claims to Santa Rosa Island been adjudicated? If Native American rights to the island have not been extinguished, what efforts have been made to represent their alternatives in the RMP/EIS?

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- A. *The Chumash Indians brought litigation in federal court in the 1980's challenging the ownership of Santa Rosa Island by members of the Vail family and the Vickers Company, Ltd. In 1986, the U.S. Court of Appeals for the Ninth Circuit determined that the Chumash lost all rights to the island when they failed to present claims of ownership to the island in land confirmation hearings organized by the federal government in the 1850s. These hearings were held to resolve title disputes over land acquired by the United States from Mexico pursuant to the Treaty of Guadalupe Hidalgo. On December 8, 1986, the U.S. Supreme Court refused to grant review of the Ninth Circuit opinion. Further information regarding these court proceedings can be found in the Ninth Circuit's opinion, which is reprinted in 788 F.2d 638 (9th Cir. 1986).*

Issue: Conformance with Existing Legislation

Comment Letters: California Cattleman's Association, Vail & Vickers, Jayne Belnap, Jeff Burgess, James Conroy, John Vickers Crawford and Anne Vickers Crawford, Craig Dremann, D. Chris Jones, Ronnie Glick, Michael F. Goldman, Elizabeth L. Painter, Jacob Sigg, John J. Wooley, Margaret V. Wooley, Vincent Yoder

- Q. The RMP/EIS should discuss the relative conformance of the different alternatives with existing laws. NPS needs to determine whether the various alternatives comply with the 1916 Organic Act (16 USC 1 et seq.) that requires lands to be managed to conserve resources "in such a manner...as will leave them unimpaired for the enjoyment of future generations." Alternative E is the only alternative that complies with the 1916 Organic Act.
- A. *NEPA regulations do not require the Park to include in the EIS an analysis of the extent to which each alternative meets NPS legal mandates and policy. NPS will discuss the relationship of the various alternatives to applicable laws and policies in the Record of Decision.*
- Q. Doesn't the enabling legislation guarantee Vail & Vickers the right to continue grazing until 2011? Congress clearly intended for Vail & Vickers to have the opportunity to continue ranching for a period not to exceed 25 years. The purchase agreement was predicated on the 25 years of continuous use. This intent takes precedence over the general preservation goals for NPS management provided by the NPS Organic Act. Congress was willing to establish the Park and acquire Santa Rosa island, recognizing full well that the preservation policies of the NPS would not be fully implemented until the 25-year interim use period expired.
- A. *The Park's enabling legislation, found at 16 U.S.C. § 410ff, was passed by Congress in 1980. At the time, Santa Rosa Island was owned by members of the Vail family and the Vickers Company, Ltd. The Park's enabling legislation required the Secretary of the Interior to acquire Santa Rosa Island as expeditiously as possible. The legislation also authorized the private owners to retain either a reservation of use and occupancy over all or a portion of the island for a term not to exceed 25 years, or to enter into a lease agreement with the NPS. If the owners retained a reservation of use and occupancy or a lease, the legislation further specified that the former owners could continue their existing activities provided those activities were not incompatible with the administration of the Park or the preservation of park resources. That Congress imposed these conditions on any reservation or lease demonstrates that there was no Congressional intent to guarantee that the former owners could continue their operation for 25*

years despite the impact of this activity on the Park. However, as explained below, these conditions are not applicable to the present situation because the former owners did not request a reservation or a lease for their ranch operation.

After passage of the Park's enabling legislation, the NPS entered into negotiations with the private landowners to reach an agreement regarding the island's acquisition by the United States. Several years of negotiations ensued and the island was finally purchased by the United States in 1986. The private owners did not wish to enter into a lease with the NPS, nor did they wish to retain a reservation of use and occupancy for their commercial ranch operation. Instead, the private owners retained a 25-year, non-commercial reservation of use and occupancy over approximately 8 acres of land comprising their ranch house and outbuildings. The ranch operation was authorized separately under the terms of a Special Use Permit. (As described in our response to the question below, the NPS may issue permits for ranch operations pursuant to the NPS Organic Act and NPS regulations.) The NPS issued a five-year, revocable Special Use Permit for the ranch operation in 1987 and a second such permit in 1993. The ranch is currently operated under the terms of the 1993 permit. The NPS intends to replace that permit with a new permit following completion of the RMP EIS process.

NPS also received several comments stating that there was an agreement or contract between NPS and the former owners that requires the NPS to allow the ranch to continue operating without restriction until 2011. NPS disagrees with these comments. At the time of the island's acquisition, the NPS did not enter into any oral or written contract with the former private owners that would guarantee their ability to continue their ranch operation under a permit for 25 years. Nor was the issuance of successive permits for a 25 year period a condition of the sale of the island. Rather, the ranch operation is subject to the terms of the NPS Organic Act, the Park's enabling legislation and other applicable laws and regulations.

- Q. If Vail & Vickers only reserved a right of non-commercial use, and turned down the option of a lease, then what legal authority allows them to continue commercial ranching? And why are they allowed to continue this commercial use until 2011, if they have no rights to do so?
- A. *The RMP EIS has been prepared by the NPS in an effort to improve water quality and to promote the conservation of rare plant and animal species on Santa Rosa Island. To achieve these goals, the RMP presents five different alternatives for the management of cattle, elk, deer and island roads. Although it is not necessary to include in this EIS an analysis of the extent to which each alternative meets NPS legal mandates and policy guidelines, NPS received many comments requesting an explanation of NPS's authority to issue a permit to V&V for their ranch operation.*

With respect to the management of the ranch operation, applicable NPS legal authorities are found in the NPS Organic Act, 16 U.S.C. §§ 1-4, as amended, the Park's enabling legislation, 16 U.S.C. § 410ff, and NPS regulations found in 36 C.F.R. Parts 1-6. The NPS management policies that apply to the ranch operation include the 1988 NPS Management Policies and NPS guidelines regarding natural and cultural resource management. Other laws such as the Endangered Species Act and the Clean Water Act also apply to the ranch operation.

The NPS Organic Act states that the NPS may allow grazing within units of the National Park System provided that the use is not detrimental to the primary purpose for which the park was

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established by Congress. See, 16 U.S.C. § 3. (The NPS Organic Act is the primary authority in this case because the former private owners did not elect to continue grazing under the enabling legislation's provisions authorizing a reservation or lease). In parks where NPS authorizes ranching pursuant to 16 U.S.C. § 3, the NPS issues a permit for the activity. The issuance of permits is based on criteria found in NPS' regulations and policies, including 36 C.F.R. § 1.6. Pursuant to these laws and regulations, the NPS issued a five-year, revocable permit to V&V in 1993. That permit expires on December 31, 1997.

The RMP EIS considers the scope of activities authorized under the Special Use Permit. After the final decision on the RMP, the NPS intends to make the Special Use Permit consistent with the management practices selected by NPS in its RMP/EIS Record of Decision. Accordingly, NPS intends to replace Vail & Vickers' 1993 permit with a new permit that incorporates the management practices described in the RMP alternative that is ultimately selected by NPS in the Record of Decision.

- Q. The actions in the RMP/EIS constitute a breach of the contract between NPS and Vail & Vickers. The Special Use Permit was a condition of sale of the island. Santa Rosa Island was sold to NPS under threat of condemnation; it was not a free market, willing sale.
- A. *NPS received several comments stating that there was an agreement or contract between NPS and the former owners that requires the NPS to allow the ranch to continue operating without restriction until 2011. NPS disagrees with these comments. At the time of the island's acquisition, the NPS did not enter into any oral or written contract with the former private owners that would guarantee their ability to continue their ranch operation under a permit for 25 years. Nor was the issuance of successive permits for a 25 year period a condition of the sale of the island. Rather, the ranch operation is subject to the terms of the NPS Organic Act, the Park's enabling legislation and other applicable laws and regulations.*
- Q. The continuance of elk and deer hunting are part of the Federal government's promise to Vail & Vickers.
- A. *NPS received several comments stating that there was an agreement or contract between NPS and the former owners that requires the NPS to allow the ranch to continue operating without restriction until 2011. NPS disagrees with these comments. At the time of the island's acquisition, the NPS did not enter into any oral or written contract with the former private owners that would guarantee their ability to continue their ranch operation under a permit for 25 years. Nor was the issuance of successive permits for a 25 year period a condition of the sale of the island. Rather, the ranch operation is subject to the terms of the NPS Organic Act, the Park's enabling legislation and other applicable laws and regulations.*
- Q. What are NPS' obligations to Vail & Vickers? Does a verbal or written agreement exist which guarantees Vail & Vickers the right to graze Santa Rosa Island until 2011?
- A. *At the time of the island's acquisition, the NPS did not enter into any oral or written contract with the former private owners that would guarantee their ability to continue their ranch operation under a permit for 25 years. Nor was the issuance of successive permits for a 25 year period a condition of the sale of the island. Rather, the ranch operation is subject to the terms of the NPS Organic Act, the Park's enabling legislation and other applicable laws and regulations.*

Issue: Conformance with NPS Management Policies and Guidelines

Comment Letters: California Native Plant Society (Roberson), National Parks and Conservation Association, Ronnie Glick, Elizabeth L. Painter

- Q. The RMP/EIS should analyze whether a grazing operation on Santa Rosa Island is consistent with NPS resource management goals and mandates.
- A. *NEPA regulations do not require the Park to include in the EIS an analysis of the extent to which each alternative meets NPS legal mandates and policy. NPS will discuss the relationship of the various alternatives to NPS resource management goals in the Record of Decision.*
- Q. Grazing is completely incompatible with National Park Service management goals and objectives.
- A. *NPS disagrees with this statement. The NPS Organic Act states that the NPS may allow grazing within units of the National Park System provided that the use is not detrimental to the primary purpose for which the park was established by Congress. See, 16 U.S.C. § 3. In parks where NPS authorizes ranching pursuant to 16 U.S.C. § 3, the NPS issues a permit for the activity. The issuance of permits is based on criteria found in NPS' regulations and policies, including 36 C.F.R. § 1.6.), NPS management policies state that grazing be managed through the use of best management practices such that 1) grazing does not result in significant damage to park resources; 2) composition, condition, and distribution of native plant and animal communities and ecosystem dynamics are not significantly altered; and 3) conflicts with public use are minimized.*
- Q. NPS management policies state that commercial grazing should be managed such that it does not result in significant damage to park resources, will not conflict with public use, will not significantly alter the composition, condition, and distribution of native plant and animal communities and ecosystem dynamics, and will not occur in fragile riparian zones. Further, the policies state that NPS will eliminate grazing in an orderly and cooperative manner when grazing conflicts with the public enjoyment of the park or would interfere with the function of the natural ecosystem. NPS will not expend funds to construct or maintain commercial livestock facilities unless there is a direct benefit to protection of park resources. NPS is not following its own internal policies regarding grazing management on Santa Rosa Island.
- A. *NPS disagrees with this comment. The purpose of the RMP/EIS is to evaluate different alternatives for grazing and road management in order to promote the conservation of rare species and to protect water quality. NPS will evaluate the extent to which these alternative achieve NPS goals in the ROD.*
- Q. National Park Service management policies require NPS units to ensure that Park operations do not adversely impact endangered, threatened, candidate or sensitive species, and that management actions must place highest priority on identifying and removing the threat of extinction. In light of this, how can the Park justify continuation of current stocking rates on most of SRI, and maintenance of an elk herd?

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- A. *The Proposed Action in this Final RMP/EIS modifies stocking rates on SRI and proposes changes in the management of deer and elk. NPS will evaluate the extent to which these alternative meet NPS policies in the ROD.*
- Q. National Park Service management policies also require NPS units to actively manage endangered and threatened species for recovery. None of the alternatives in the DEIS contain measures to actively manage Proposed Species or Species of Concern, and, with the exception of Alternative E (Immediate Removal), none of the alternatives bring about general habitat protection until well into the next century.
- A. *The actions contained in this Final RMP/EIS are designed to recover populations and habitats of species proposed for listing as endangered under the Endangered Species Act. The U.S. Fish and Wildlife Service has issued a conference opinion that states that the preferred alternative is fully protective of proposed plant taxa. The USFWS has also concurred that the proposed alternative will not affect the western snowy plover.*
- Q. Although NPS management policies require NPS units to perpetuate native plant life as part of natural ecosystems, none of the alternatives in the DEIS include specific measures to restore native vegetation on the majority of SRI lands.
- A. *The actions contained in this Final RMP/EIS are designed to facilitate recovery of native vegetation types on Santa Rosa Island, and include rapid removal of deer, gradual removal of elk, pasture closures and reduction in stocking levels for cattle and horses. These actions are the most significant measures that can be taken to recover native plant communities. More specific and local actions such as use of prescribed fire cannot be implemented until these larger livestock management actions occur.*
- Q. NPS management policies direct NPS managers to halt human-caused erosion and to restore slopes to natural contours and vegetation assemblages. Livestock-related erosion is “human-caused” and so should be halted, in order to comply with NPS management policies.
- A. *Measures contained in the Proposed Action of this Final RMP/EIS are designed to halt livestock-related erosion.*
- Q. According to NPS management policies, control or eradication of alien species is to be undertaken if those species threaten to alter natural ecosystems, present a hazard to human safety, and seriously restrict populations of native taxa. The high susceptibility of the alien annual grasses to fire is not only a threat to human safety but also to natural ecosystems and to native taxa.
- A. *The measures contained in the Proposed Action of this Final RMP/EIS are intended to decrease the dominance of alien grasses and encourage invasion of alien grasslands by native vegetation. However, alien grasses are not treated as an alien plant in the same context as other, more aggressive species such as thistles or fennel. The latter are subject to specific control measures. Alien annual grasses cover about 85% of Santa Rosa and are not amenable to control or eradication in that sense, but require habitat level measures.*

Issue: Conformance with NPS Planning Documents for Channel Islands National Park

Comment Letters: Jayne Belnap, John Cloud, Ronnie Glick, Elizabeth L. Painter

Q. The existing Preferred Alternative does not conform with the General Management Plan (GMP) for Channel Islands National Park. The GMP was developed under the assumption that grazing would cease. The GMP states that ranching and other commercial operations would be discontinued after acquisition. Some non-native herbivores were to be retained as part of a 800-acre demonstration ranch. The GMP also acknowledged that 95% of the island was designated as a “natural area” where vegetation would be allowed to return to a pre-European condition. This cannot happen with any ungulates on the island. Continuation of grazing is in contradiction of NPS planning documents for Santa Rosa Island.

A. *The Park’s general management plan (NPS 1984, 1985) directs that ranching and other commercial activities on Santa Rosa be phased out, with retention of a small demonstration ranch near Beecher’s Bay. The GMP does not prescribe a timeline for this to occur. The Proposed Action in this Final RMP/EIS envisions phased reduction of livestock over the next 14 years and allows for the retention of a small demonstration ranch.*

Q. The RMP/EIS should document how each alternative conforms with the Park’s GMP.

A. *NEPA regulations do not require the Park to include in the EIS an analysis of the extent to which each alternative meets NPS legal mandates and policy. NPS will discuss the relationship of the various alternatives to NPS policies in the ROD.*

Q. The GMP said that low-impact camping would be permitted at designated sites throughout most of the “backcountry” (95% of the island). To date, this has not been implemented.

A. *Designation of back-country camping sites is beyond the scope of this resources management plan.*

Monitoring

Issue: Monitoring (General)

Comment Letters: California Native Plant Society (Roberson), National Parks and Conservation Association, Multiple Use Managers, Inc., Rob Klinger, Elizabeth L. Painter

Q. The RMP/EIS should contain an inventory of all natural and archeological resources potentially affected by livestock. The baseline data should include soils inventory and maps, descriptions and maps of vegetation types, quantification of existing conditions and livestock utilization patterns, maps of affected or potentially affected water sources, water quality data, descriptions of existing aesthetic issues, conditions of archeological resources, and conditions of threatened, endangered, rare and sensitive species populations and habitat.

A. *Since purchasing Santa Rosa Island in 1986, the National Park Service has begun inventory and monitoring efforts on the island. Funding constraints have limited the amount of work*

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that has been accomplished in this regard, but significant progress has been made in recording archeological sites, distribution and abundance of rare plant species, and water quality and riparian function. Information gained from these investigations has been used to identify resource problems on Santa Rosa Island and to develop the conservation strategy presented in this plan's Proposed Action. Completing a comprehensive inventory of the island's natural and cultural resources, and their condition, will be an ongoing effort for NPS for the foreseeable future.

- Q. The Park should construct numerous exclosures to determine the effects that deer, elk and cattle have on natural resources.
- A. *Given the degraded condition of some resources (such as plant species proposed for listing) and the immediate need for action (as per the Cleanup or Abatement Order issued to the Park by the Central Coast Water Quality Control Board), the Park cannot afford to wait for the results of exclosure studies. Nor would such studies provide any new information relevant to decision-making; problems such as cattle grazing effects on riparian areas/water quality and deer effects on island shrubs and rare species are well documented, and support the Proposed Action contained in this Final RMP/EIS.*
- Q. Even though NPS guidelines for grazing management require resources inventory and monitoring as well as monitoring of stock use and associated impacts, the RMP/EIS proposes no monitoring plan for many resources, including soils, native plant communities, and browse utilization. Additionally, the lack of a range conservationist on Park staff prevents the Park from effectively monitoring stock use and RDM levels. The Final RMP/EIS should contain proposed monitoring for elk, cattle and other resources.
- A. *The Park will monitor deer browsing on Arctostaphylos, as a mitigation measure. See the Proposed Action section for other proposed monitoring. The Park currently monitors native plant communities on Santa Rosa Island, as well as other Park islands. The Park has recently hired a permanent, full-time range management specialist who will enter on duty May 12, 1997. The range management specialist will conduct monitoring, as well.*

Issue: Cost of Monitoring

Comment Letters: Santa Barbara Urban Creeks Council

- Q. The Final RMP/EIS should provide specific costs associated with the proposed monitoring for each alternative.
- A. *The NPS does not believe that such information is relevant to the RMP/EIS. The RMP was prepared to evaluate options to improve water quality and to promote the conservation of rare plant and animal species on Santa Rosa Island. Past costs incurred by the NPS with respect to the ranch operation are not a factor in NPS' decision-making process for the RMP.*

Issue: Monitoring of Native Plant Communities on Santa Rosa Island

Comment Letters: California Native Plant Society (Roberson)

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Q. The Final EIS should contain proposals for monitoring native plant communities.

A. *The Park currently monitors native plant communities on Santa Rosa Island, as well as on other Park islands.*

Issue: Monitoring of Water Quality and Riparian Areas

Comment Letters: National Parks and Conservation Association (Roberson), Vail & Vickers, Elizabeth L. Painter, Jeff Reiner

Q. Water quality monitoring should include fecal coliform analysis, conductivity, pH, turbidity, and macroinvertebrate community composition. Water quality monitoring should be expanded from the current limited program in three drainages to cover more of the island's 18 drainages, in order to insure that water quality levels are acceptable in those drainages and in wetland areas. Decreasing water quality monitoring frequency from monthly to quarterly or annually will not allow NPS to respond adequately to continued or increased degradation of water quality. Unless NPS monitors water quality monthly in all watersheds and wetlands, NPS will not be able to determine actual improvement or deterioration of water quality. NPS should consider greenline and transect monitoring in riparian areas, and should monitor recruitment of cottonwood and willows and other woody riparian species.

A. *The Park is currently working with the NPS Water Resources Division to shift its Santa Rosa Island water quality monitoring from a limited program monitoring compliance with water quality standards to a comprehensive program focused on documenting recovery of water quality values and riparian function. The Regional Water Quality Control Board has indicated its approval of the concept of such a shift in monitoring. Riparian monitoring will be designed to measure changes in the resource attributes that will track, over time, progress in improvement of streambank cover and stability, and decrease in bank and channel erosion. Monitoring protocols that will be adopted on selected stream segments will include the U.S. Bureau of Land Management's Greenline-Riparian Wetland Monitoring technique (BLM 1993) to monitor streamzone vegetation. Stream channel morphology and streambank stability measures as described by EPA (1993) will be used to monitor changes in channel depth and width, streambank cover, overhanging vegetation and streambank livestock utilization. Water quality values will continue to be monitored by synoptic sampling of fecal-indicator bacteria and nutrients, though not on a monthly basis. The Park would work with the RWQCB to ensure that the monitoring program meets applicable State standards.*

Issue: Monitoring Livestock Utilization

Comment Letters: National Parks and Conservation Association, Elizabeth L. Painter

Q. Monitoring livestock utilization is important to determine if present stocking rates are valid and if SRI's resources are being protected adequately. Monitoring should include number and type of livestock, season of use, duration and frequency, and spatial distribution.

A. *The Park will monitor livestock utilization via monthly reporting of cattle and horse utilization, by pasture.*

NEPA Process

Issue: The Role of Vail & Vickers in the NEPA Process

Comment Letters: California Cattleman's Association

- Q. The special contractual relationship between NPS and Vail & Vickers requires NPS to enter into careful and considered consultation, cooperation and coordination with Vail & Vickers, according to the Public Rangelands Improvement Act of 1978. This public law affords lessees/permittees such as Vail & Vickers greater participation in the development of management plans than that afforded the general public under NEPA.
- A. *The Public Rangelands Improvement Act does not apply to grazing within units of the National Park System. However, the NPS has worked closely with Vail & Vickers during the NEPA process for this planning effort, and also in the context of the Cleanup or Abatement Order issued by the Regional Water Quality Control Board, and in the context of ascertaining measures to protect the proposed plant taxa. Vail & Vickers has had numerous opportunities to participate in the development of new ranch management plans.*

Issue: Use of Economic Impacts in Analysis

Comment Letters: Ronnie Glick

- Q. Economic impacts cannot and should not be considered when evaluating impacts under the National Environmental Policy Act (NEPA) of 1969. The NPS is obligated to choose the project alternative that will guarantee the greatest environmental benefit, regardless of the economic impact.
- A. *NEPA does not require Federal agencies to select the alternative with the greatest environmental benefit. NEPA does, however, require agencies to disclose the environmental impacts of each alternative. The Final RMP/EIS fully satisfies that requirement. While proposed projects that cause only economic impacts do not trigger NEPA, NEPA requires that any proposal that will cause environmental impacts also include information regarding the economic impacts of the proposal. Because the alternatives in the RMP cause environmental impacts, the NPS has also included a discussion of the economic impacts of each alternative.*

Rare Species

Issue: Status and Trend of Rare Plant Populations on Santa Rosa Island

Comment Letters: Natural Resources Conservation Service, William T. Everett

- Q. Aren't some of these species just naturally rare, and have been largely unaffected by management practices? Doesn't the fact that these plant species still exist after 150 years of

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grazing and browsing indicate that they are, in fact, not threatened with extinction? The Draft RMP/EIS presents no evidence that cattle ranching or commercial hunting activities are the primary factors causing apparent declines of rare species or habitats.

- A. *National Park Service, USFWS biologists and other knowledgeable experts have documented impacts to rare species from current land management practices on Santa Rosa Island. Documentation of these impacts is summarized in the USFWS proposal to list those species as endangered. Recent investigations have presented additional documentation of these impacts (McEachern 1996, McEachern et al. 1997).*

Issue: Effects on Western Snowy Plovers

Comment Letters: Natural Resources Conservation Service, U.S. Fish and Wildlife Service, Santa Rosa Chapter, Santa Cruz Island Foundation, D. Chris Jones, Elizabeth L. Painter

- Q. Impacts to western snowy plovers from cattle have been insignificant, and so breaching of the cattle enclosure fence on Skunk Point is irrelevant.
- A. *Cattle trampling of plover nests on Santa Rosa Island has been documented (Keimel 1992, Stein 1993). In a biological opinion in 1995, USFWS required the Park to minimize such take of plovers by such measures as removing cattle from Old Ranch Pasture during plover breeding season, or excluding cattle from plover nesting areas during breeding season via construction and maintenance of a fence. As a Federal agency, NPS must comply with the Endangered Species Act. The NPS therefore constructed and maintained the cattle enclosure fence.*
- Q. The Biological Opinion from U.S. Fish and Wildlife Service regarding the effects of Park operations on western snowy plovers discussed the effects of cattle and the potential loss of nests from predation and high winds as indirect effects of the presence of cattle. The RMP/EIS should include this information from the Biological Opinion.
- A. *The NPS disagrees with this comment. The biological opinion in question did not identify the potential loss of nests from predation and high winds as indirect effects of the presence of cattle.*
- Q. The Draft RMP/EIS mentions “current beneficial” effects of livestock on the snowy plover, but does not specify what these might be. It also says that cattle grazing effects on nesting snowy plovers on beaches other than skunk point are “unknown, but probably negligible”. Since the effects on Skunk Point have been found to be adverse, NPS needs to explain why this probably would not be the case at other sites.
- A. *According to the biological opinion issued by USFWS on the effects of Park activities on plovers, nesting on beaches other than Skunk Point is more dispersed, and plover nests on other beaches may therefore be less susceptible to take resulting from recreational and grazing activities.*

Issue: The Northern Channel Islands Listing Proposal

Comment Letters: U.S. Fish and Wildlife Service

- Q. The RMP/EIS should note that the moratorium on listing species under the Endangered Species Act has been lifted.
- A. *The Final RMP/EIS has been revised accordingly.*

Issue: NPS Requirements Under the Endangered Species Act

Comment Letters: U.S. Fish and Wildlife Service, California Cattleman's Association

- Q. The RMP/EIS should be revised to indicate that NPS is required to confer with USFWS on potential actions which are likely to jeopardize the continued existence of proposed species.
- A. *The RMP/EIS has been revised to reflect NPS' conferencing efforts with USFWS regarding proposed species.*
- Q. Vail & Vickers should be granted applicant status in the development of a biological assessment by NPS and in the subsequent issuance of a biological opinion by the USFWS.
- A. *Vail & Vickers has worked closely with the NPS during the NEPA process and was involved in a joint effort by NPS and USFWS to negotiate a conservation agreement regarding the plant species proposed for listing as endangered. Vail & Vickers was given ample opportunity to submit information regarding their proposals for the conservation of these species. Vail & Vickers also provided information to NPS during the comment period on the Draft RMP/EIS. Vail & Vickers has had ample opportunity to provide information to NPS and USFWS regarding the issuance of a conference opinion for the RMP/EIS.*

Issue: Effects on Peregrine Falcons and Brown Pelicans

Comment Letters: U.S. Fish and Wildlife Service, Elizabeth L. Painter

- Q. The RMP/EIS incorrectly states that U.S. Fish and Wildlife Service has proposed that peregrine falcons be delisted. USFWS published a notice of intent to prepare a proposed rule; a proposed rule has not yet been published.
- A. *The Final RMP/EIS has been revised accordingly.*
- Q. The Draft RMP/EIS does not discuss possible impacts to peregrine falcons and brown pelicans, two listed bird species. Poor water quality may negatively effect the brown pelican, particularly at the mouths of streams. Possible negative impacts of livestock on peregrine falcon prey may be significant.
- A. *NPS has concluded that there will be no effects on peregrine falcons or brown pelicans from the Proposed Action in this Final RMP/EIS. USFWS has concurred with this conclusion.*

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- Q. The Draft RMP/EIS should consider possible impacts to other rare bird taxa: burrowing owl (*Athene cunicularia*), mountain plover (*Charadrius montanus*), Xantus' murrelet (*Synthliboramphus hypoleuca*), and long-billed curlew (*Numenius americanus*).
- A. *NPS has concluded there will be no specific impacts on any of the species in question from the Proposed Action in this Final RMP/EIS.*

Issue: Effects of the Alternatives on Rare Plant Species

Comment Letters: California Native Plant Society (Roberson), California Native Plant Society (Matthews), National Parks and Conservation Association, Santa Barbara Urban Creeks Council, Washington Native Plant Society, Vail & Vickers, Michael Donnellan, Henry Eggers, Ronnie Glick, Elizabeth L. Painter, Margriet Wetherwax

- Q. None of the alternatives in the DEIS target rare species habitat for specific protection from grazing impacts, except for the relatively small area of Old Ranch Pasture. Protection of rare species requires immediate islandwide reduction in stocking rate, altering livestock management in rare species habitat, immediate removal of livestock, or phased removal of livestock from such areas. Thus, only Alternative E (Immediate Removal) would achieve the goal of immediate, effective protection from grazing impacts for the majority of rare plant species on Santa Rosa Island.
- A. *The Proposed Action in this Final RMP/EIS protects and recovers rare species populations and habitat by immediate closure of Old Ranch and Carrington pastures to grazing, phased closure of Pocket Field and North Pastures, rapid reduction of deer, and phased reduction of elk.*
- Q. Implementation of a grazing rotation in North Pasture would actually increase grazing pressure on rare species of plants, especially in the Black Mountain area of North Pasture. This would not result in a net benefit to rare species on the island.
- A. *The Proposed Action in this Final RMP/EIS does not contain a proposal for a grazing rotation in North Pasture, or in any other pasture.*
- Q. Specifically, grazing pressure would not be reduced in Carrington Pasture, which contains habitat for several proposed species.
- A. *The Proposed Action in this Final RMP/EIS proposes an immediate closure of Carrington Pasture to cattle and horse grazing, in order to protect and recover populations and habitat of proposed plant taxa.*
- Q. Although removal of deer may reduce browsing pressure to five proposed species, the DEIS does not discuss browsing pressure by elk and cattle. Such browsing pressure can be heavy in summer, when herbaceous forage is gone, or has cured and is unpalatable.
- A. *The Proposed Action in this Final RMP/EIS prescribes an immediate closure of Old Ranch and Carrington pastures to grazing, phased closure of Pocket Field and North Pastures,*

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rapid reduction of deer, and phased reduction of elk. These measures would reduce browsing pressure on rare taxa and on native vegetation communities.

- Q. The Preferred Alternative does not provide an adequate level of protection to assure the long-term survival of soft-leaved paintbrush, *Castilleja mollis*. The prostrate stems of *C. mollis* are extremely brittle and easily broken by foraging animals. The plants are hemi-parasitic (they must have a host plant in order to survive to reproductive state) and their most probable hosts are in the Asteraceae (such as *Isocoma*) and Poaceae families. The host plants are currently threatened by damage from grazing, trampling, and habitat erosion. Without host plants available The NPS should eliminate deer from the island, eliminate or control elk, and close both Carrington Pasture and the coastal terrace of Pocket Field Pasture to cattle grazing.
- A. *The Proposed Action in this Final RMP/EIS contains the following measures that would serve to protect and recover populations and habitat of Castilleja mollis: immediate closure of Carrington Pasture to cattle and horse grazing; immediate reduction of stocking level in Pocket Field and closure of Pocket Field to grazing in 2000, rapid reduction of deer, phased reduction of elk, and monitoring of elk impacts on Castilleja.*
- Q. The Preferred Alternative does not provide adequate protection for the island oak (*Quercus tomentella*). There are few seedlings and no younger individuals of island oak in the groves. Elk pellets can be found within and among the groves. Elk need to be eliminated, along with the deer, in order to give the island oaks a chance for recruitment and growth.
- A. *The Proposed Action in this Final RMP/EIS contains a phased reduction of elk that would reduce browsing pressure on seedling of island oak.*

Restoration Plans

Issue: Proposed Restoration Plans

Comment Letters: National Parks and Conservation Association, Santa Barbara Urban Creeks Council, Elizabeth L. Painter

- Q. The Draft RMP/EIS provides little information about what is actually planned to restore the island's ecosystem. The Plan should include a comprehensive restoration overview, and a detailed master plan needs to be in place as livestock are removed. Restoration efforts should not be confined to riparian exclosures.
- A. *Under the Proposed Action in this Final RMP/EIS, NPS would undertake a number of actions to restore native plant communities and rare species on Santa Rosa Island. Actions to be undertaken are:*
- *Seed banking of proposed plant species*
 - *Control of invasive alien plants in sensitive habitats*
 - *Testing of fire as a tool for restoration of native plant communities*
 - *Restoration plantings of A. hoffmannii, A. confertiflora, Dudleya greeneyi forma nova, Dudleya candelabrum, Quercus tomentella, Pinus torreyana ssp. insularis, Populus trichocarpa ssp.*

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balsamifera, Sambucus mexicana, Salix lasiolepis, Heteromeles arbutifolia, Quercus agrifolia var. agrifolia

· *Erosion control in sensitive habitats*

It is likely, assuming continuation of existing funding levels, that NPS would have adequate funds to undertake the above actions. Implementation of additional desirable actions, such as large-scale erosion control, growing and transplanting of rare species, and more extensive control of alien plants, would be contingent on receiving additional funds or other assistance.

Q. What are the projected costs for proposed restoration activities? What would be the source of the funding?

A. *The NPS does not believe that such information is relevant to the RMP/EIS. The RMP was prepared to evaluate options to improve water quality and to promote the conservation of rare plant and animal species on Santa Rosa Island. The measures in the Proposed Action in this Final RMP/EIS are implementable without requiring the Park to obtain considerable additional funds.*

Issue: Plant Propagation

Comment Letters: National Parks and Conservation Association, Vail & Vickers, Elizabeth L. Painter

Q. The Draft RMP/EIS provides little information about propagation and revegetation with native plant materials. The Plan should include a protocol for plant propagation.

A. *Plant propagation methods are currently being developed at the Park by the Park's Plant Ecologist. It is a "work in progress", and it is not necessary to describe the methods in this Final RMP/EIS.*

Issue: Mitigation of Erosion and Sedimentation

Comment Letters: Tom Dudley

Q. The Park should begin to install debris retention devices in incised streams to begin to trap material that would otherwise be transported to the sea, and also promote vegetation establishment within channels so that trapped sediments could be stabilized by natural vegetation complexes (roots and organic materials).

A. *Such actions are desirable, but implementation of such actions, including large-scale erosion control, growing and transplanting of rare species, and more extensive control of alien plants, would be contingent on receiving additional funds or other assistance.*

Road Management

Issue: Impacts of Current Road Management on Natural Resources

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Comment Letters: Cachuma Resource Conservation District, California Regional Water Quality Control Board - Central Coast Region, U.S. Environmental Protection Agency, California Cattleman's Association, California Native Plant Society (Roberson), Vail & Vickers

Q. The RMP/EIS should discuss the effects that current and proposed road management practices, including the effects of vehicle usage associated with the ranch and hunt operation, have on natural resources on Santa Rosa Island.

A. *That analysis has been added to this Final RMP/EIS.*

Q. High sediment loads in the island's streams are primarily due to NPS road management practices. The roads have been made far more extensive, further graded and far more utilized by NPS than ever by Vail & Vickers.

A. *The Proposed Action in this Final RMP/EIS contains road management measures that would minimize road maintenance-induced sediment transport to surface waters.*

Issue: Permitting Requirements for Road Management Actions on Santa Rosa Island

Comment Letters: U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service.

Q. The RMP/EIS should discuss the appropriate permit requirements, including those derived from Sections 404 and 401 of the Federal Clean Water Act, for proposed road management actions on Santa Rosa Island.

A. *The Park has applied for and received a 404 permit from the U.S. Army Corps of Engineers for NPS road maintenance activities. As part of the 404 process, the Corps required NPS to obtain 401 certification from the Regional Water Quality Control Board that the activities will conform to State water quality standards.*

Socioeconomic Issues

Issue: Cost Estimates for Proposed Management Actions

Comment Letters: U.S. Fish and Wildlife Service, California Native Plant Society (Roberson), National Parks and Conservation Association, Jayne Belnap, Gary M. Fellers, Elizabeth L. Painter

Q. The RMP/EIS should contain detailed estimates of costs for the proposed management actions, including weed management, riparian exclosures, and other range improvements, as well as probable funding sources for each anticipated cost.

A. *NEPA does not require NPS to include such cost estimates in the Final RMP/EIS.*

Q. The RMP/EIS should contain an accurate and complete cost/benefit analysis, including the cost of preparing planning documents for the continuation of ranching and hunting

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operations, meeting with the permittee and the public regarding the ranching and hunting operations, preparing documents addressing impacts such as the Conservation Agreement and Rapid Riparian Assessment, prohibiting public access to portions of SRI, performing multiple monitoring tasks, constructing and purchasing raw materials for fencing, verifying livestock inventories, and maintaining 58 miles of unimproved roads to monitor ranch and hunting operations.

- A. *NEPA does not require NPS to perform a cost/benefit analysis for the Final RMP/EIS.*
- Q. The RMP should also contain an accounting of total costs since 1986 of the continuation of the commercial ranch/hunt operation on Santa Rosa Island. This should include all costs paid for by public funds, including NPS, NBS, DFG, USFWS, CCRWQCB, contractors, academic faculty, and students.
- A. *NEPA does not require NPS to include such cost estimates in the Final RMP/EIS. The RMP was prepared to evaluate options to improve water quality and to promote the conservation of rare plant and animal species on Santa Rosa Island. Past costs incurred by the NPS with respect to the ranch operation are not a factor in NPS' decision-making process for the RMP.*
- Q. Costs to the taxpayer should be minimized. The NPS should not subsidize the ranching and hunting operation by paying for fencing and other range improvements. How can NPS propose to pay for all the fencing, if there isn't enough money to pay for weed management? The Vails should pay for the cost of fencing and water developments.
- A. *NPS has not proposed to pay for all fencing required for any of the alternatives. Vail & Vickers will be required to pay for required fencing.*

Issue: Economic Impact to the Permittee

Comment Letters: Range Watch, Vail & Vickers, Ronnie Glick

- Q. The loss of income to Vail & Vickers from curtailing the hunting program and the cost of removing elk and deer from the island should not be a factor in determining the schedule and method of withdrawal of ungulates.
- A. *While income and other economic factors were not the primary factors NPS considered, NPS did strive to develop a proposed action that used realistic timeframes within the overall context of NPS management responsibilities.*
- Q. If a large number of cattle are removed, and the ranch or a major portion of the ranch or grazing is closed, then the ranch would no longer be able to stay operable. Thus, Alternatives D and E would put the ranch out of business.
- A. *Under Alternative E, ranching would cease. However, under Alternative D., based on available information, NPS believes that Vail & Vickers could maintain viable operations for some time.*

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- Q. Implementation of the removal schedule proposed in the Preferred Alternative would interfere with the management capability of the ranch and the management of the commercial hunt operation. The deer management program contributes significantly to the economic viability of Vail & Vickers.
- A. *The NPS recognizes that Vail & Vickers derive profits from their deer hunting operation. However, NPS believes that the timeframe in the Proposed Action for deer removal is realistic and based upon available information, will not unduly interfere with the ranch's other operations.*

Issue: Visitor Access to Santa Rosa Island

Comment Letters: California Wilderness Coalition, National Parks and Conservation Association, Natural Resources Defense Council, Santa Barbara Urban Creeks Council, Stephen Byrd, John Cloud, Chris L. Dryer, Michael F. Goldman, Melville Mackler, Elizabeth L. Painter, Lynne Sherman, David and Lisa Smith, James G. Weber

- Q. Public access to over 80% of Santa Rosa Island has been eliminated to accommodate the commercial hunting and grazing operations. This is contrary to the purposes for which National Parks are established. The Draft RMP/EIS fails to acknowledge or adequately assess the restrictions on visitor use associated with current management, particularly those restrictions in place to prevent conflicts with the ranch and the even greater restrictions in place during the seasonal hunts. This is contrary to statements in the 1993 SUP promoting “public use and visitation on a year-round basis”, and statements in the Deed of Sale allowing Vail & Vickers use of roads and trails “provided such use does not interfere with the use of roads and trails by the National Park Service and park visitors.” The RMP/EIS needs to address how the restrictions on visitor access now in place will be changed by each of the alternatives.
- A. *The Proposed Action in this Final RMP/EIS eases the current restrictions on visitor use by lifting the requirement for visitors to be escorted by a Ranger while on the island. See “Increased Visitor Access” section of Alternative D.*
- Q. Poor water quality is detrimental to visitor use of the island, since it represents a threat to visitor health. This needs to be addressed in the RMP/EIS.
- A. *Implementation of the Proposed Action in this Final RMP/EIS would decrease the chance of visitors contacting contaminated water. Under this alternative, the pastures where visitors are most likely to contact water (Old Ranch Pasture and North Pasture) are targeted for immediate closure and rapid reduction of stocking level, respectively, in order to bring about rapid improvement in water quality.*

Soils

Issue: Effects of the Alternatives on Soil Resources

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Comment Letters: Natural Resources Conservation Service, California Native Plant Society (Roberson), Range Watch, Santa Barbara Urban Creeks Council, Jayne Belnap, John Vickers Crawford and Anne Vickers Crawford, Ronnie Glick, Melville Mackler, Elizabeth L. Painter

- Q. The Preferred Alternative has a minimal beneficial effect on soils because of one pasture closure, but the detrimental effects of localized and widespread increased erosion near Black Mountain and Brockway offset the benefits. Erosion will continue at existing levels (nine times pre-European levels) in Pocket Field and South Pastures, and might increase in areas of Black Mountain Pasture. Only Alternative E adequately and comprehensively addresses the issue of soil deterioration, erosion, and sedimentation.
- A. *The Proposed Action in this Final RMP/EIS mitigates impacts to soils rapid by removal of deer, phased removal of elk, pasture closures, and phased reduction of stocking levels. Implementation of these measures would result in reduction and eventual elimination of all ungulate impacts to soils, and subsequent stabilization and recovery of those soils. There will thus be decreased trampling of soils islandwide, resulting in increased soil stability, increased water availability for vascular plants, and decreased soil loss; increased nutrient availability to plants; and decreased vegetation loss.*
- Q. There is a concern that NPS and ranch activities, including pedestrians, have a large effect on soils.
- A. *NPS believes the contribution of pedestrians to impacts on soil is relatively insignificant, especially relative to impacts by cattle, horses, deer and elk. This is because human feet exert a static ground pressure of approximately 9 pounds per square inch, which is about one third that exerted by cattle (24 pounds per square inch) (Ratliff 1985). Also, cattle, elk, deer and horses occur in much greater numbers on Santa Rosa Island than do humans. Most human foot traffic is confined to roads and developed areas.*
- Q. Sediment production would increase under both the Preferred Alternative and Alternative D, due to livestock concentration around water developments and seasonally in some pastures under rotational grazing.
- A. *The Proposed Action in this Final RMP/EIS does not contain a proposal for emplacement of water developments and implementation of rotational grazing. Impacts to soil resulting from such practices would not occur, if the Proposed Action was implemented.*
- Q. Impacts from off-highway vehicle use (such as for the commercial hunting operation) on soils are not considered in the RMP/EIS.
- A. *Analysis of such impacts has been added to this Final RMP/EIS.*
- Q. Soils in arid regions take thousands of years to form. Loss of this resource should not be taken lightly, since it will take many lifetimes to be replaced. Presence of ungulates is incompatible with soil stability on the island, and is an unsustainable use of the resource, as attested by the large increases in sediment loss. This conflicts with the enabling legislation, the GMP and the stated goals of this plan.

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- A. *NPS agrees that that soil is an irreplaceable resource. The Proposed Action in this Final RMP/EIS mitigates impacts to soils by rapid removal of deer, phased removal of elk, pasture closures, and phased reduction of stocking levels. Implementation of these measures would result in reduction and eventual elimination of all ungulate impacts to soils, and subsequent stabilization and recovery of those soils.*
- Q. Although NPS acknowledges that prevention of soil erosion in woodland and chaparral communities is required for recovery of some rare plant taxa, no such protection is included in alternatives until 2011, and there are no integrated plans to protect soils from erosion or protect soil crusts from livestock. These are necessary components of any ecosystem-level management plan for rare plant taxa.
- A. *NPS and USFWS have both identified soil erosion and loss as a primary impactor on the proposed species *Arctostaphylos confertiflora*, and on chaparral communities. The Proposed Action in this Final RMP/EIS mitigates impacts to soils by rapid removal of deer, phased removal of elk, pasture closures, and phased reduction of stocking levels. Implementation of these measures would result in reduction and eventual elimination of all ungulate impacts to soils, and subsequent stabilization and recovery of those soils.*

Issue: Potential for Recovery of Soils

Comment Letters: U.S. Fish and Wildlife Service

- Q. The RMP/EIS states that stabilization and recovery of soils should subsequently occur when grazing end in 2011. The rationale for this should be given, since it runs contrary to what is generally known about recovery of soils. Available scientific evidence holds that stabilization and recovery of soils may take many years.
- A. *Cessation of grazing, whenever it occurs, would result in elimination of all ungulate impacts to soils, and subsequent stabilization and recovery of those soils. There would be decreased trampling of soils islandwide, resulting in increased soil stability, increased water availability for vascular plants, and decreased soil loss; increased nutrient availability to plants; and decreased vegetation loss. It is true that soil recovery would take a long time, but the process cannot begin until ungulates are removed and impacts eliminated.*

Issue: “Background” Levels of Soil Erosion and the Relative Effect of Sheep and Cattle

Comment Letters: California Cattlemen’s Association, Santa Rosa Chapter, Santa Cruz Island Foundation

- Q. The NPS fails to take into account background levels of soil erosion, due to natural slope instability. The chronology of the geological events which led to the creation of the arroyo system on Santa Rosa Island is poorly understood. The canyons on Santa Rosa have no analogues on the other Channel Islands, and so it is impossible to state what they “should”

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look like. The Pleistocene terrace deposits into which most of the streams are incised are poorly consolidated and easily eroded.

- A. *It is true that the creation of the arroyo system on Santa Rosa Island requires more research to be more fully understood. However, there is information regarding “background” levels of soil erosion. Cattle and, formerly, sheep and alien pigs have accelerated soil erosion and increased slope failures on Santa Rosa Island. The NPS has analyzed a 5 meter / 5,200 year-old soil core collected in 1989 from a small estuary at the eastern end of the island (Cole and Liu 1994). The core showed an increase in sedimentation rates from an average of 0.7 mm per year for the 5,000 year period prior to settlement (or the “background” erosion rates) to an average of 13.4 mm per year for the post settlement period. Sedimentation rates peaked from 1874 to 1920, at 23.0 mm per year.*
- Q. The majority of the recent erosion on Santa Rosa Island occurred during the sheep ranching era. Since sheep were replaced by cattle, erosion and sedimentation rates have declined, and stabilized.
- A. *Current sedimentation rates are still much greater than the “background” sedimentation rates mentioned above.*

Issue: Effects on Nutrient Cycling

Comment Letters: California Cattlemen’s Association, Elizabeth Painter

- Q. Nutrient cycling is enhanced by properly managed livestock grazing; nutrients would otherwise be lost to wind and mechanical breakdown.
- A. *NPS does not agree with this comment. Natural nutrient cycling is generally disrupted by grazing (Fleischner 1994) and the impacts of grazing on the nutrient cycling capabilities of microbial crusts are becoming apparent (see the “soils” sections of the Affected Environment and Environmental Consequences” chapters).*
- Q. On-going, cumulative nutrient losses are not considered in the Draft RMP/EIS, although these may have significant negative impacts to ecosystems and the rare taxa in them. Severe decreases in nutrients and/or their availability to native taxa may result from livestock damage to both the cryptobiotic soil crusts and mycorrhizal fungal hyphae in the soils. Livestock herbivory always results in a net loss of nutrients, since livestock are exported rather than decomposing in place. Nutrients are also lost through urine volatilization. In addition, feces are slow to decompose in arid and semi-arid climates. Fecal decomposers are limited or missing, so nutrients in dung are not readily recycled. Feces can take several years to decompose and can smother plants beneath them.
- A. *NPS agrees that these are general effects of grazing on nutrient cycling. It is not know to what degree they occur on Santa Rosa Island under the present grazing regime. If such impacts were occurring, implementation of the Proposed Action set forth in this Final RMP/EIS would arrest such impacts and restore natural nutrient cycling regimes through pasture closures, reduction of stocking levels, and eventual phaseout of all ungulates from the island.*

Issue: Effect of RDM Management on Soil Erosion

Comment Letters: California Native Plant Society (Roberson)

- Q. Higher minimum RDM standards may or may not slow crust damage and surface erosion. RDM standards are generally averages which may not adequately protect significant areas (such as shaded areas, riparian zones and areas around water developments) from forage overuse and soil damage. Additionally, there currently is no range conservationist on Park staff to monitor and enforce RDM standards.
- A. *All other factors being equal, higher RDM standards confer greater protection on areas by ensuring more biomass is left in place to retard runoff and erosion. Protection of the significant areas mentioned would be accomplished, under the Proposed Action, through pasture closures, reductions in stocking levels, and emplacement of cattle exclosures.*

Issue: Cryptobiotic Crusts

Comment Letters: California Native Plant Society (Roberson), Jayne Belnap, Elizabeth L. Painter

- Q. Although the RMP/EIS discusses the importance of cryptobiotic soil crusts, there is no integrated plan to protect them from alien livestock. The Plan includes no information concerning restoration of damaged soil crusts once livestock are removed. The Draft RMP/EIS does not present survey data or any other information on the current extent or state of cryptobiotic crusts on Santa Rosa Island, nor are crusts treated in the Environmental Consequences section. Generally, grazing, trampling and off-highway vehicle use are known to damage and destroy crusts. With the exception of Alternative E (Immediate Removal) none of the alternatives in the Draft RMP/EIS would significantly reduce grazing and vehicle impacts over much of the island. The Final RMP/EIS should include a discussion of the current state and extent of cryptobiotic crusts on SRI and science-based predictions of probable effects of the various alternatives on crusts.
- A. *Under the Proposed Action, microbiotic crusts would be protected by pasture closures, reduction of stocking levels, and eventual phaseout of all ungulates from the island. These ungulate management measures would need to be implemented prior to any hands-on management of microbiotic soils. Currently, such soils or potential microbiotic soil areas are not mapped, and implementation of active management would be premature.*

Vegetation

Issue: Status and Trend of Shrub Communities on Santa Rosa Island

Comment Letters: Natural Resources Conservation Service, California Cattleman's Association

- Q. The Park needs to cite evidence that there is a decline in shrub diversity, distribution and density.

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- A. *What we observe in the native woodland and shrubland communities, which are the communities primarily utilized by deer for feeding and bedding, are evidence of decline in those communities. The most pervasive and irreversible impact is the loss of soil. There are excessive areas of bare ground in all of these communities, far beyond that expected or observed in areas not subject to this type and intensity of disturbance. The litter layer is at or near zero in many areas. Ungulate trails have been worn to bare rock. Newer trails are deeply grooved in the soils. Pedestals of soil protrude in protected areas between trails. Native plant habitats are extremely fragmented. There are large components of non-native species in the native plant communities. Both the releve and long-term vegetation community monitoring data reflect these conditions.*

*The buds and flowering tips of woody species are nearly 100% browsed wherever they can be reached by ungulates. For some low-growing species, such as Manzanita (*Arctostaphylos confertiflora*, *A. tomentosa* v. *subcordata*), there is no portion of the plant that is not browsed every year. To the best of their recollection, Park botanists have never seen an accessible *Arctostaphylos* plant that was not heavily browsed. *Arctostaphylos* is the one of the key native plant species in the island chaparral.*

The original research work to establish the monitoring program (Clark et al. 1990) found that populations of native perennial grasses, woodland and scrub communities are highly fragmented and depauperate. There is only one place on the island where a portion of Coastal Sage Scrub community is completely inaccessible to any ungulates, due to deep erosional gullies surrounding it. Here Clark, et al. (1990) found that the community was intact, non-fragmented, functional, and had low amounts of bare ground, high native plant diversity, and only a small proportion and diversity of non-native plants:

...Coastal Sage Scrub, is particularly vulnerable to the long-term effects of grazing...In addition to the loss of biomass from direct browsing, many of the native species off this community suffer reproduction impairment under heavy grazing, causing these taxa to be unable to maintain populations through periods of prolonged grazing...[this] reveals a strong inversion relationship between animal disturbance and species diversity and shrub canopy cover.

*In a number of areas "orphan" *Arctostaphylos* and *Jepsonia* plants occur in areas (now occupied by non-native grassland) surrounding degraded chaparral community. *Arctostaphylos* and *Jepsonia* only occur in shrubland communities; they do not occur in grassland. These plants, which probably do not live longer than 30 years, likely represent the former extent of the chaparral community, which has retracted due to browsing and grazing pressures. Many areas of the chaparral community are in a degraded state and have been invaded by non-native grasses and forbs.*

Aerial photos of Santa Rosa Island show an island dominated by non-native grasslands. The native plant communities are highly fragmented with considerable areas of bare ground. Community boundaries are convoluted and appear to be determined primarily by erosion.

Issue: Recovery of Native Shrub Species

Comment Letters: California Native Plant Society (Roberson)

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- Q. Despite identification of woodland and shrub communities as critical remnant habitats for Proposed Species and Species of Concern, the DEIS contains no specific measures (prescribed fire, browse limits, livestock management) to reduce damage or promote expansion of these communities. The Final EIS should contain specific plans for beginning to restore native shrub and woodland communities.
- A. *Under the Proposed Action in this Final RMP/EIS, protection and recovery of woodland and shrub communities would be accomplished by large-scale ungulate management measures: rapid reduction of deer, phased reduction of elk, closure of pastures to cattle and horse grazing, and reduction in stocking levels. Specific measures such as prescribed fire would have to await results of implementation of large-scale ungulate management measures. It would thus be premature to include such detailed measures in this plan.*

Issue: Effect of Livestock on Island Vegetation

Comment Letters: National Park and Conservation Association, Multiple Use Managers, Inc., Eric Cardenas, Ronnie Glick, Elizabeth L. Painter, John J. Wooley

- Q. Livestock management plans need to be built around the premise that native taxa on SRI have little or no large-herbivore resistance. The plants, animals and vegetative communities on the Channel Islands evolved without grazing pressure from large ungulates (with the possible exception of the pygmy mammoth), Although a certain amount of herbivore resistance may be found in the native taxa through exaptation, there is not enough supporting evidence to incorporate such possibilities into a management plan. Maintaining and enhancing Santa Rosa Island's native vegetation is not compatible with continued livestock grazing.
- A. *NPS believes that the approaches to non-native ungulate management contained in the preferred alternative (Alternative D) will allow for the maintenance and enhancement of native vegetation on Santa Rosa Island..*
- Q. Didn't the endemic plants evolve in the presence of mammoths, which were undoubtedly grazers? Is it possible that the endemic plants require grazing?
- A. *Mammoths disappeared from Santa Rosa Island approximately 11,000 years ago. Thus, the selective pressure that a large herbivore would have on island vegetation has been absent for that time period.*
- Q. Without grazing there would be few open soil areas where tree and shrub seedlings can become established.
- A. *To the contrary, grazers eat seedlings of shrubs and trees before they can become established as saplings resistant to herbivory. Open soil areas produced by grazers are often compacted, and this level and frequency of disturbance is more conducive to establishment of alien plant species than to native trees and shrubs.*

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- Q. In the island oak groves, some roots are as much as six feet above ground level, due to erosion of topsoil from livestock effects. This is not compatible with the goals of the NPS.
- A. *Under the Proposed Action, influence of non-native ungulates would be reduced and eventually eliminated via rapid reduction of deer and phased reduction of elk. This would allow for the eventual recovery of island soils.*
- Q. The island cannot be restored to pristine conditions. We do not have a good idea of what the island looked like before grazing. Further NPS labels the effects of European cultural practices as deleterious, and those of native Americans as benign. The entire concept of restoring the island to perceived conditions at some arbitrary point in time shows a serious lack of understanding of the system as long-term, dynamic and evolving. Desired future conditions should include the presence of humans and grazers.
- A. *See the section on Guidance for Natural and Cultural Resources Management in the Purpose and Need chapter for a discussion of appropriate NPS management goals.*

Issue: Effects of Alternatives on Native Vegetation

Comment Letters: California Native Plant Society (Roberson), Santa Barbara Urban Creeks Council, Tom Dudley, Ronnie Glick, Elizabeth L. Painter

- Q. The Preferred Alternative contains few improvements to native vegetation outside of Old Ranch Pasture and the riparian enclosures. Implementation of rotational grazing in North Pasture will increase cattle impacts and damage in the proposed Black Mountain Pasture. Maintenance of a viable elk herd and continuation of intensive grazing on the bulk of SRI will not allow recovery of native vegetation. These outcomes are in direct conflict with the stated goals of the RMP.
- A. *Alternative C, is no longer the preferred alternative. Implementation of the new Proposed Action, Alternative D, would result in significant improvements to native vegetation, islandwide.*
- Q. The RMP/EIS should contain specific protection measures for vernal pools. Once grazing is removed from these areas, measures must be taken to reduce invasion of these sites by alien plants.
- A. *Under the Proposed Action, closure of Old Ranch Pasture and reduction in stocking level and eventual closure of Pocket Field Pasture would constitute significant protection for the vernal pools in those pastures. The Park will monitor possible establishment of alien plant species in or near vernal pools.*
- Q. Alternative D manages most of the island's pastures for non-native, annual grassland when NPS is mandated to manage the island to restore native grassland, chaparral and coastal sage scrub communities.
- A. *The revised Alternative D was designed to protect and restore native vegetation communities, islandwide.*

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Q. Alternative B manages most of the island's pastures for non-native, annual grassland when NPS is mandated to manage the island to restore native grassland, chaparral and coastal sage scrub communities. Impacts to native plant communities will continue at existing levels.

A. *Alternative B is not the preferred alternative.*

Q. None of the alternatives specifically protect unique plant communities such as coastal marsh, caliche scrub, coastal dune scrub and lupine scrub.

A. *Alternative D, the Proposed Action, was designed to protect and restore those and other native plant communities, islandwide.*

Water Quality/riparian Areas

Issue: Applicability of the Clean Water Act and Basin Plan to NPS and Santa Rosa Island

Comment Letters: U.S. Environmental Protection Agency, California Cattleman's Association, Santa Rosa Chapter, Santa Cruz Island Foundation, Vail & Vickers

Q. The RMP/EIS fails to acknowledge that the authority of the Regional Water Quality Board to issue an enforcement order (such as the Cleanup or Abatement Order) is derived from Section 313 of the Federal Clean Water Act. This omission may cause the public to question why a State agency can legally issue an enforcement order against a Federal land management agency.

A. *The commenter is correct that the authority of the State of California and the Regional Water Quality Boards is derived from the Federal Clean Water Act. That authority includes actions to enforce compliance with the Act. We did not receive any comments from the public questioning the authority of the State or Regional Board in this matter and don't feel it is necessary to modify the RMP/EIS in this regard.*

Q. Concerns with water quality on Santa Rosa Island are due in part to the inappropriate designation of beneficial uses for surface waters of the island by the Regional Water Quality Control Board. Neither NPS nor Vail & Vickers had input into the designation of beneficial uses for the surface waters of Santa Rosa Island. There are no municipal water uses or personal contact recreational use of the island's waters. The Park should petition the Board to designate beneficial uses more appropriate for present and future use of the island.

A. *It is correct that neither the NPS or Vail and Vickers had input into the designation of beneficial uses for the surface waters of Santa Rosa Island. However, issues related to the designation of beneficial uses of waters are beyond the scope of the RMP/EIS.*

Q. Standards traditionally applied to riparian areas are not applicable to Santa Rosa Island streams, because they are not habitat for freshwater fish.

A. *There are other values associated with riparian areas, which are applicable to the streams on Santa Rosa Island. Riparian and wetland areas provide numerous additional ecological*

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services such as erosion control, sediment filtration, floodwater retention, water quality enhancement, habitat for riparian vegetation and wildlife. These values are discussed in the RMP/EIS.

Issue: Water Quality Monitoring Data from Santa Rosa Island

Comment Letters: Vail & Vickers, John Vickers Crawford and Anne Vickers Crawford

Q. The water quality data that show fecal coliform problems in Lobo Canyon, Quemada Canyon and Water Canyon were taken at selected areas, either immediately downstream or closely associated with cattle handling or cattle loitering areas.

A. *We are not aware of any cattle handling areas in the vicinity of the monitoring stations for fecal coliform. Cattle loitering areas occur commonly in riparian habitats island-wide. Therefore, such areas do occur upstream from sampling locations and are representative of general water quality conditions.*

Water quality monitoring sites were selected in conjunction with water resource professionals from the Water Resources Division, NPS and the Central Coast Water Quality Control Board. The sites were selected to be representative of the conditions in those drainages.

Q. High fecal coliform values may be due to human use of the island's waters, or wildlife use.

A. *It is unlikely that human use contributes in any way to fecal coliform values in the Santa Rosa Island streams. All of the monitoring stations for fecal coliforms are in areas only rarely used by humans. Island wildlife do contribute to fecal coliforms in sampled streams, however, this is likely to be negligible. Wildlife species, such as island fox, Santa Rosa Island deer mouse, and Santa Rosa Island spotted skunk, do not occur in high enough densities to cause fecal coliform levels to exceed the currently designated beneficial uses.*

Issue: Effects of the Alternatives on Water Quality and Riparian Areas

Comment Letters: California Regional Water Quality Control Board - Central Coast Region, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service, California Cattlemen's Association, California Native Plant Society (Roberson), National Parks and Conservation Association, Santa Barbara Urban Creeks Council, Vail & Vickers, James W. Bartolome, Tom Dudley, Ronnie Glick, Stephen R. Gliessman et al., Elizabeth L. Painter, Jeff Reiner, David and Lisa Smith

Q. Given the limited information obtainable about livestock on Santa Rosa Island and the fact that no pasture would be "closed" to all classes of livestock, it is not possible to determine whether improvements in water quality would actually be "substantial", "moderate", or "minimal" in any watershed under alternatives A-D.

A. *The NPS has modified Alternative D (now the final Preferred Alternative) so that livestock management includes pasture closures and reduction of cattle numbers in pastures with the*

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most significant water quality, biological resource, and public visitation values. The Environmental Consequences chapter of this RMP/EIS identifies and quantifies the environmental impacts of these actions.

- Q. Implementation of the Preferred Alternative would allow continued, unabated impact on most surface waters over the next 15 years, and would fail to provide for recovery of water quality. All or most of the streams in South and Pocket Field Pastures would be left unprotected from the effects of grazing. Only Alternative E shows any potential to immediately or decisively address water quality problems. Recovery of riparian habitat and water quality improvement would be completed 10-15 years earlier than under any other alternative.
- A. *The Preferred Alternative has been modified to provide for much more rapid and extensive improvement in water quality on Santa Rosa Island. The Environmental Consequences chapter of the RMP/EIS addresses the effect of each of the alternatives on water quality and riparian habitat.*
- Q. Implementation of the proposed split of North Pasture and subsequent grazing rotation would result in significant impacts to water quality in that pasture. The rest period is too short to produce improvement in riparian function and water quality. Adverse impacts on water quality may increase during the rainy season in Brockway when the pasture will receive double its current use and when soils are moist and susceptible to damage and sediment loss. Dry soils near riparian areas are usually less susceptible to cutting and chiseling from cattle hooves that are wetted soils, and in many regions managers have a policy that livestock cannot be brought into the grazing units until soils have substantially dried. During wet periods on SRI it is highly likely that even small numbers of cattle could still do extensive damage to steep, erosive slopes and stream channel margins. Adverse impacts would occur in Black Mountain Pasture during summer, and the proposed water developments would not be adequate to mitigate increased impacts.
- A. *The NPS has re-evaluated the effects of splitting North Pasture into two pastures to be grazed on a seasonal basis. We agree with the commenter that there is potential for greater impacts to some resources from the proposed split of North Pasture. As a result the Conservation Strategy Alternative was modified. Instead, livestock numbers will be reduced over 11 years in North Pasture. The greatest reduction in livestock numbers will happen in the next three years, and should result in considerable benefits to water quality, riparian habitat, and uplands.*
- Q. The proposed construction of nine small riparian exclosures would result in limited benefits to water quality and riparian areas. They would not prevent extensive use of the creeks by livestock. They will do little to reduce watershed erosion and enhance water quality. The area of drainage protected by the exclosures in comparison to the total area of drainage will not be large enough to treat the quantity of sediment and nutrients coming from upstream. It is questionable whether stream channel morphology and riparian vegetation will approach desired conditions, due to perturbations occurring upstream. Larger exclosures or riparian pastures are needed. Given the effort that NPS would need to expend to erect, maintain and monitor the exclosures, the RMP/EIS should provide a more detailed discussion of benefits of such exclosures, focused on whole watersheds instead of the limited effects within exclosures themselves.

- A. *The NPS believes that the RMP/EIS adequately addresses the effects of small riparian exclosures on water quality. We realize that the exclosures alone would not result in extensive improvements in water quality and riparian resources. However, we have reevaluated the actions in the preferred alternative. In the final Preferred Alternative, reductions in livestock stocking levels and pasture closure are the tools for improvements in water quality and riparian habitats in most areas. These actions will result in extensive improvements in water quality and riparian habitats. Small riparian exclosures will only be used in two areas of existing high value riparian resources. Riparian resources and water quality within these exclosures would improve.*
- Q. In Sierra Nevada meadows, fencing half-mile portions of streams from grazing has proven unsuccessful in improving eroded and incised stream channels. Continued erosion above and below exclosures has inhibited recovery within fenced areas. Similar scaling problems will probably occur in the small riparian exclosures proposed for Santa Rosa Island. It would be far more effective to exclude livestock from entire watersheds. Furthermore, the cost and repair needs for many small fences may be greater than for larger, more accessible areas.
- A. *Comment noted. We have altered the final Preferred Alternative, in part, because of issues such as those raised in this comment*
- Q. Seasonal or rotational grazing schemes have not proven effective for managing annual grasslands or associated riparian areas. NPS should not invest in significant fencing or additional water developments to implement seasonal or rotational grazing. If the objective is to protect water quality and associated habitats this can be accomplished by better use of RDM standards and selective pasture closure.
- A. *The preferred alternative has been modified. Selective pasture closure is a better tool to achieve improvements in riparian areas. This action, as well as reductions in livestock numbers in selected pastures, are the primary tools in the final Preferred Alternative to achieve water quality and riparian improvements. The park would use RDM standards for management of annual grasslands in upland areas.*
- Q. Water developments associated with the Preferred Alternative may deprive riparian areas and springs of water. What effects would they have on stream flows, springs, groundwater and riparian vegetation?
- A. *There will be no new water developments under the final Preferred Alternative.*
- Q. Alternative D will not protect all the riparian areas on the island, will place additional strain on the drainages in Black Mountain Pasture, will increase erosion in that pasture, would not address impacts in South Pasture, and would double impacts to riparian areas in Brockway and Pocket Field Pastures.
- A. *We agree that there were increased impacts on some resources from the Alternative D described in the draft RMP/EIS. Following receipt of public comments and additional analysis, that alternative has been modified to drop all actions which shifted resource impacts from one area to another.*

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- Q. Alternative B will have minimal beneficial impacts to water quality, since it only targets five drainages on the island, and will only improve riparian vegetation in a limited area. It will not significantly improve water quality even in the drainages that receive protection because livestock will continue to use areas between riparian exclosures, continue to defecate in the water and will continue to concentrate around riparian areas. High bacteria levels and poor water quality will continue in all drainages. Impacts to riparian vegetation will continue throughout the island, except within the riparian exclosures.
- A. *The RMP/EIS describes the beneficial effects of this alternative as being fairly limited in scope. Alternative B would have minimal beneficial impacts to water quality and this would only occur in selected areas of the island.*
- Q. Protection of watersheds and riparian areas should be expanded to include protection of all water-associated ecosystems on Santa Rosa Island, including 1) perennial, intermittent and ephemeral streams, 2) springs and seeps, 3) small vernal freshwater wetlands, 4) the estuarine and vernal high marsh at Old Ranch Canyon, and 5) other coastal wetlands on the east end and at the mouth of Arlington Canyon.
- A. *In developing and selecting the final Preferred Alternative, the NPS evaluated the best method of achieving the long-term goal of protection of all water-associated ecosystems on Santa Rosa Island. Pastures with the highest concentration of perennial streams, remnant riparian woodland habitat, and visitor use were prioritized for more rapid reduction of livestock. The water-related resources in Old Ranch Pasture will be completely protected from direct livestock impacts by 1997. The water-related resources in Pocket Field will be completely protected from direct livestock impacts by 2000.*
- Q. Vernal pools have become rare statewide, and there is limited information about number, distribution, condition, flora and fauna, etc. on Santa Rosa Island. Cattle are reported to frequent the vernal wetlands, and weedy plant taxa appear to be a problem. No provisions for protection of vernal pools are included in the Draft RMP/EIS.
- A. *The park has surveyed Santa Rosa Island for vernal pools. Most of the known pools occur in Old Ranch Pasture and Pocket Field. The presence of the pools was one of the reasons these pastures were identified for early phase-out of ungulates.*
- Q. Water troughs and tanks built for livestock need to be removed and vegetation in areas around them need to be restored. Water impoundments and diversion such as Clapp Springs need to be restored.
- A. *Water developments will continue as they are in pastures which remain open to livestock use. The NPS has not made a decision on the long-term management of water impoundments and diversions. Water tanks will not be filled with water once cattle are no longer using them.*

We have asked the Water Resources Division, NPS to provide technical assistance to the park on the restoration of the marsh in Old Ranch House Canyon. The management of Clapp Springs is connected to the restoration of the marsh and will be evaluated at that time.

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- Q. Since existing proposed actions (small riparian exclosures and rotational grazing) are inadequate to restore riparian function and water quality values, NPS should consider implementation of utilization standards specific to riparian vegetation and streambank disturbance. Additional grazing management required for this would include additional water developments and livestock herding. The utilization standards would include 1) a range of livestock utilization (30-40%) of herbaceous vegetation within the riparian area; 2) a range of livestock utilization (not greater than 20%) of shrub vegetation within the riparian area; and 3) a range of livestock utilization (10-20%) of streambanks, measured by livestock disturbance/trampling of streambanks.
- A. *The NPS considered an alternative of this sort but decided that riparian resources would be better protected, and Vail and Vickers would have better knowledge of how many cattle they would be permitted to have on the island, under a fixed schedule for managing livestock within pastures.*

Issue: Achieving Plan Objectives for Water Quality and Riparian Areas

Comment Letters: National Parks and Conservation Association, Santa Barbara Urban Creeks Council

- Q. To achieve its stated purpose of ensuring that “management of alien ungulates will protect or recover riparian habitat and water quality”, the RMP/EIS must include requirements to inventory and monitor, and protective measures for all aquatic systems including perennial, intermittent, and ephemeral streams, springs and seeps, small vernal freshwater wetlands, the estuarine marsh, and vernal high marsh in Old Ranch Canyon, and the coastal wetland on the east end of the island and at the mouth of Arlington Canyon.
- A. *The final Preferred Alternative uses the tools of pasture closure and reduction of ungulate numbers to protect and recover riparian habitat and water quality. Pastures with the highest concentration of perennial streams, remnant riparian woodland habitat, and visitor use were prioritized for more rapid reduction of livestock. The water-related resources in Old Ranch Pasture will be completely protected from direct livestock impacts by 1997. The water-related resources in Pocket Field will be completely protected from direct livestock impacts by 2000.*
- Q. The Preferred Alternative realistically accomplishes its goals for water quality improvement in only one pasture. Any gains from the Preferred Alternative would be geographically limited, limited to a few watersheds, isolated, and delayed. The other watersheds and streams are ignored for another 15 years. Continued decline in these pastures would offset the benefits on the one pasture. The alternative does not achieve Plan goals for water quality because it does not even attempt to improve water quality in half the drainages and it may even cause additional adverse impacts to water quality in Black Mountain pasture drainages.
- A. *The NPS revised the Preferred Alternative in response to public comments and further consideration of resource information and agency responsibilities. We feel that the final Preferred Alternative achieves substantial improvement in water quality for many island streams. Additionally, those streams with the most significant resources, highest potential for recovery, and greatest public use were selected for earlier protection.*

Issue: Rapid Riparian Assessment

Comment Letters: Santa Rosa Chapter, Santa Cruz Island Foundation, D. Chris Jones, John J. Wooley

Q. The Rapid Riparian Assessment completed in 1995 was based on only one visit to the island with some team members who had never been to the island before, and was conducted after two 50-year flood events. The conclusions drawn by the team are biased.

A. *The Riparian Area Management Assessment process is designed to require just one visit to a site. All of the team members were very knowledgeable regarding riparian and wetland areas throughout the western United States, including California.*

The Riparian Assessment Team was interdisciplinary and inter-agency. Team members included a hydrologist/geomorphologist, botanist, riparian vegetation specialist, water quality specialist, wetland scientist, aquatic biologist, geologist, and two range management specialists.

Q. The “non-functional rating” was developed by the Riparian Assessment Team for its own use and is arbitrary. If water enters at the top of a watershed and flows to the ocean, then the riparian area is functioning.

A. *The process for assessing proper functioning condition was not developed by the Riparian Assessment Team. This process is described in “Riparian Area Management - Process for Assessing Proper Functioning Condition (USDI-BLM Technical Reference TR 1737-9). The principal author of this technique, which has been applied to public lands throughout the west, was the leader of the Assessment Team on Santa Rosa Island. The technique characterizes riparian areas by various processes and attributes which contribute to riparian function. These processes and attributes include such factors as hydrogeomorphology, vegetation, and erosion/deposition attributes.*

Riparian and wetland areas function properly if “adequate vegetation, landform, or large woody debris is present to dissipate stream energy associated with high waterflows, thereby reducing erosion and improving water quality; filter sediment, capture bedload, and aid floodplain development; improve flood-water retention and ground-water recharge; develop diverse ponding and channel characteristics to provide the habitat and the water depth, duration and temperature necessary for fish production, waterfowl breeding, and other uses; and support greater biodiversity.” (NPS Technical Report NPS/NRWRD/NRTR-95). It is important to note that the factors evaluated by the Assessment Team are more limited than the full range of natural and cultural resources which the NPS is mandated to protect.

Issue: Riparian Area Management

Comment Letters: U.S. Fish and Wildlife Service, Tom Dudley

Q. Why does Lobo Canyon support tree and shrub species not found elsewhere on the island?

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- A. *The walls of Lobo Canyon are very steep and not easily accessed by ungulates. Also, access into the lower portions of the drainage is limited to a few areas where the terrain is more gentle. Consequently, there have been fewer ungulates in the drainage than in other areas, even before the current enclosure was constructed. The portions of Lobo Canyon which are heavily used by ungulates have vegetation similar to other areas of the island.*
- Q. The RMP/EIS should provide information on projected time frames for recovery of riparian areas and improvement of water quality.
- A. *It is difficult to estimate how long it will take for full recovery of riparian areas to occur. We expect that improvements in water quality and riparian areas will begin immediately following the removal of livestock from pastures. The rate of improvement will depend on a wide variety of factors, such as geomorphology, precipitation, livestock use within the drainage, and vegetation.*
- Q. In addition to targeting the most degraded riparian areas for management actions, the RMP/EIS should also protect those areas such as Lobo Canyon with intact riparian areas which retain better representation of pre-grazing conditions. Otherwise, these areas may become more degraded in the future. Additionally, these areas may serve as source sites for propagation material for restoration elsewhere.
- A. *The NPS agrees that protection of the riparian habitat in Lobo Canyon is very important. The removal of deer and reduction of cattle numbers in North Pasture will convey considerable protection on the riparian habitat.*

Issue: Impacts to Water Quality Values

Comment Letters: Santa Rosa Chapter, Santa Cruz Island Foundation

- Q. The reference to sediment levels “thousands of times baseline levels” is out of context, without a frame of reference. What are “normal” increases in sediment levels during major storm events. Peak stream flows with capability of carrying increased amounts of suspended sediments are to be expected during major storm events, especially when flowing through rocks as fine-grained and unconsolidated as those on Santa Rosa Island.
- A. *The commenter is correct that sediment levels will increase in waters following major storm events. We do not know what the normal sediment increase for Santa Rosa Island would be. We do know that riparian vegetation plays a large role in the trapping of sediments during flood events and that riparian vegetation, especially trees and shrubs, is largely missing from Santa Rosa Island*

Issue: Water Rights

Comment Letters: Craig Dremann

- Q. Who owns the water rights on Santa Rosa Island, what are they, and how does this affect management of the island?

RESPONSE TO PUBLIC COMMENTS

- A. *When the United States acquired Santa Rosa Island in 1986, the former owners deeded all water rights they had in the island to the United States. Therefore, there are no known constraints on NPS management actions due to private ownership of water rights on Santa Rosa Island.*

Weed Management

Issue: Distribution and Abundance of Weeds

Comment Letters: Tom Dudley

- Q. Although the RMP/EIS states that athel (*Tamarix aphylla*) occurs on Santa Rosa Island, the tamarisk species present is probably saltcedar (*T. ramosissima*) or related species. *T. aphylla* does not appear to reproduce asexually in North America nor invade beyond sites of planting, so the presence of tamarisk on the island may suggest a more invasive species of the genus. Along with *Arundo donax*, *T. ramosissima* is one of the most problematic of all riparian weeds.

- A. *Comments noted.*

Issue: Effects of Alternatives on Weeds

Comment Letters: California Native Plant Society (Roberson), National Parks and Conservation Association, Santa Barbara Urban Creeks Council, Elizabeth L. Painter

- Q. The Final EIS should contain a more detailed and comprehensive discussion of current knowledge of weed infestation and management in the Park and of likely impacts of the various alternatives on weed populations.
- A. *The Final RMP/EIS contains more detail on the current weed management program and planned actions.*
- Q. The Preferred Alternative will encourage the spread of alien plant species into areas slated for more intense stocking, such as Black Mountain and Cherry Canyon.
- A. *We agree that this is a possibility under Alternative C. It is no longer the Proposed Action.*
- Q. Serious weeds not discussed in the Draft RMP/EIS include *Atriplex semibaccata*, *Centaurea melitensis*, *Chenopodium murale*, *Erodium cicutarium*, *E. moschatum*, *Mesembryanthemum crystallinum*, *M. nodiflorum*, *Malva parviflora*, and *Sonchus oleraceus*.
- A. *We did not attempt to address all island weed species in detail in the RMP/EIS. Our goal was to provide sufficient information about non-native species to support informed review and decision-making on the management plan. All weeds will be addressed by NPS under the weed control project which has been funded for the next three years.*

Issue: Effects of Herbicides

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Comment Letters: Cachuma Resource Conservation District, California Regional Water Quality Control Board - Central Coast Region, Natural Resources Conservation Service, U.S. Environmental Protection Agency, National Parks and Conservation Association, Elizabeth L. Painter

Q. The RMP/EIS should include more detailed information on the proposed use of herbicides and their likely effects on natural resources, including water quality. The Plan should also discuss past unapproved use of herbicides such as 2,4-D by Vail & Vickers.

A. *This has been addressed in the Final RMP/EIS.*

Q. The RMP/EIS should address appropriate compliance with the Basin Plan of the Regional Water Quality Control Board, regarding use of herbicides, as well as with the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) and State pesticide requirements.

A. *This has been addressed in the Final RMP/EIS.*

Q. The RMP/EIS should discuss whether proposed NPS herbicide use includes any Class I or Class II controlled substances regulated under the Clean Air Act as ozone-depleting substances.

A. *This has been addressed in the Final RMP/EIS.*

Issue: Use of Fire to Control Weeds

Comment Letters: Santa Barbara Urban Creeks Council

Q. The Park should consider using prescribed fire to control weeds on Santa Rosa Island.

A. *The park will use prescribed fire for control of selected weeds. We are planning a restoration burn in Old Ranch Pasture this spring to encourage spread of native grasses.*

Issue: Use of Cattle to Control Weeds

Comment Letters: Natural Resources Conservation Service, California Cattleman's Association, California Native Plant Society (Roberson), Range Watch, William T. Everett

Q. The Park should consider using cattle to control weeds on Santa Rosa Island. Specifically, the Park should consider the use of carefully timed grazing to target the reproductive cycle of the weed species.

A. *The NPS considered this action but concluded, given the large pastures on Santa Rosa Island and the traditional system of season-long grazing, that there were substantial impediments and drawbacks to using limited, short-term grazing to control weeds.*

Q. If cattle are needed on the island to control weeds, then the Draft RMP/EIS should specify the exact number of cattle that are required to perform this function.

A. *Cattle are not needed on Santa Rosa Island to control weeds.*

Issue: Effect of Removal of Cattle on Weeds

Comment Letters: Natural Resources Conservation Service, California Native Plant Society (Roberson), National Parks and Conservation Association, Natural Resources Defense Center, Stephen R. Gliessman, et al., Elizabeth L. Painter, David and Lisa Smith

Q. Will weeds such as fennel undergo a rapid expansion in range once cattle are removed from Santa Rosa Island? Botanists generally believe that the possibility of an uncontrollable noxious weed “explosion”, particularly of fennel, is unlikely. With proper monitoring and eradication of outbreaks, effective weed control should be feasible on SRI, particularly if livestock are gradually removed from the island. If outbreaks of noxious weeds occur, it will be in areas that can be pre-identified based on current weed infestation, soil type and degree of disturbance.

The possibility of a weed explosion may only be myth, unsupported by scientific evidence. The continued presence of livestock may actually be increasing most weed problems. While fennel, black mustard and wild radish may expand when released from control by cattle, no evidence is offered that these weeds are present and distributed where expansion is possible, that livestock are controlling them on Santa Rosa Island, and that efforts by restoration biologists would not be sufficient to limit expansion.

A. *We agree with your concerns. We have developed the final Proposed Action in response to known impacts to sensitive resources and the best scientific information regarding the likely response of the ecosystem to changes in management. The NPS will need to monitor island resources to respond to issues which develop.*

Q. NPS cannot extrapolate the expansion of fennel on Santa Cruz Island as a justification for not removing cattle from Santa Rosa Island. The expansion of fennel on Santa Cruz occurred because of a specific combination of factors: fennel was already present in low abundance, the drought was over, and the highest concentrations of fennel occurred where livestock created the most disturbance.

A. *We agree. Fennel occurs on Santa Rosa Island in limited areas. The reduction of livestock, especially horses, will remove a significant vector for spread of seed. We consider fennel to be one of the species which has the potential to be invasive to relatively intact habitats.*

Q. Cattle are the most important dispersal mechanism for weeds on SRI. If cattle are removed, then this dispersal mechanism is eliminated. The benefit of reduced dispersal of many alien species will outweigh the cost of reduced cattle control of fennel. Continued presence of alien livestock may be more detrimental than their rapid removal. The only management needed to prevent establishment of at least some alien weeds and to enhance competitiveness of native taxa may be removal of disturbance sources.

A. *We agree that there will be many benefits to resources from the removal of grazers. The final Proposed Action incorporates sequential closure of pastures and phased reduction of livestock in an orderly manner which will allow the NPS to address weed issues as they arise*

RESPONSE TO PUBLIC COMMENTS

- Q. If the Park is concerned about the possibility of an explosion of weeds following an abrupt termination of grazing, then why does the Preferred Alternative, as well as Alternatives A (No Action) and B (Minimum Action), propose abrupt termination of grazing in 2011?
- A. *The issue of rapidly removing grazers over most of Santa Rosa Island is a problem with Alternative A, B, and C. The final Proposed Action phases out grazing in an orderly manner, with the pastures having the most significant resources targeted for earlier phase-out.*
- Q. If it is determined that the possibility of a weed explosion is so great as to preclude halting grazing immediately, then NPS should develop and immediately implement a phaseout reduction plan that includes provisions for monitoring and controlling weed outbreaks. A phased withdrawal of grazing from the island, where livestock densities are reduced gradually and relatively uniformly island-wide, may be the approach least likely to trigger noxious weed problems.
- A. *The final Proposed Action includes closure of pastures to livestock, as well as phased reduction of livestock from pastures. We do not believe that the probability of a weed explosion is so great as to preclude halting grazing immediately in those pastures which contain high densities of significant resources. However, we will be monitoring the response of weeds in these pastures and will adjust control efforts as necessary.*
- Q. The Draft RMP/EIS provides no evidence that weeds associated with livestock presence do not pose a greater threat than those which might increase without livestock, and no guarantee that any such research will be conducted.
- A. *The final Proposed Action provides substantial opportunities to study the effects of livestock removal and some limited monies have been identified to test weed control methods. Sufficient funds have not been found to pursue the numerous research opportunities which are present with the changes in island management. The park invites proposals for research which would further knowledge of island resources.*

Issue: Management Strategies for Weed Control

Comment Letters: California Native Plant Society (Roberson), Santa Barbara Urban Creeks Council, Rob Klinger, Elizabeth L. Painter

- Q. The management strategies most likely to achieve the weed management goals stated in the Plan are 1) a generalized phased reduction in island-wide stocking rate over several years; 2) a program of carefully timed short-duration grazing to create a selective pressure against non-native weeds; and 3) an immediate cessation of grazing. These management strategies also have greater potential to begin the timely restoration of water quality, rare species and native vegetation than other alternatives presented in the DEIS. The final plan should analyze either phased reduction of grazing or targeted timed grazing in conjunction with a specific weed control plan as a management strategy for weed management.

RESPONSE TO PUBLIC COMMENTS

- A. *The final Proposed Action incorporates phased reduction of grazing island-wide and immediate cessation of grazing in selected pastures for the purpose of protection of park resources. Additionally, fire and direct weed control efforts will be used to increase pressure on non-native species.*
- Q. The NPS should shift away from species by species weed management. The most productive, long-term solution might be to expand the scope of monitoring to include measures of succession (rather than simple changes in particular parameters), identify potential problem species or guilds associated with the general successional pattern, then determine whether these should be (or even could be) dealt with on an individual species basis.
- A. *The NPS will prioritize weed species for control based on their invasiveness in relatively undisturbed vegetation communities, feasibility of control, and extent of current infestation. We will look at broadly applied tools, such as fire, to encourage expansion of native grasses and shrub communities into non-native grasslands.*
- Q. Regarding weeds, the only justification for not removing all herbivores immediately would be to allow NPS time to conduct research into impacts of abrupt removal of alien livestock. However, the Draft RMP/EIS provides no such guarantee that any such research would be conducted.
- A. *The NPS has identified some monies to develop a weed management plan and expand weed control efforts. The final Proposed Action provides for an orderly phase-out of ungulates in a manner that provides substantial opportunities for understanding*
- Q. Since many weed species readily colonize disturbed areas, weed control measures should target weed surveys and eradication efforts on disturbed areas such as roads, livestock trails, stock ponds and trampled and eroded streambanks.
- A. *NPS weed control efforts will place the highest priority on invasive species that are able to colonize relatively intact native habitats. Weeds in disturbed habitats will be of a lower priority, unless those species are highly invasive. The proposed island management will reduce the amount of new ground disturbance and should result in slowing the spread of species that are dependent on that type of habitat.*

Issue: Weed Management Plan for Santa Rosa Island

Comment Letters: California Native Plant Society (Roberson), National Parks and Conservation Association, Elizabeth L. Painter

- Q. Since weed control is one of the primary goals of the RMP/EIS, and since weed problems following removal of grazing is a management concern, the RMP/EIS should contain a specific weed plan for Santa Rosa Island. The plan should include identification of areas vulnerable to weed infestation, and areas currently weed-free areas; identification of problem species, identification of available and appropriate control and restoration methods, a survey and monitoring program that targets problem areas, experimental designs for proposed weed research, and a prioritization of weed problems for implementation of control.

RESPONSE TO PUBLIC COMMENTS

- A. *The NPS will be developing a weed management plan for Santa Rosa Island during the next year. We already have a substantial amount of information on weed ecology and extent which has been applied to prioritizing ongoing weed control efforts.*

Issue: Funding for Weed Eradication

Comment Letters: California Native Plant Society (Roberson), National Parks and Conservation Association, Santa Barbara Urban Creeks Council, Jayne Belnap, Elizabeth L. Painter

- Q. How can there be funding for water developments and enclosure fencing while funding for weed eradication is unavailable under any alternative? Under Alternative E (Immediate Removal), why can't savings from monitoring and fencing be applied to weed management?
- A. *Range improvements will be paid for by the permittee. The NPS will pay for weed eradication.*
- Q. Although the Draft RMP/EIS states that "comprehensive weed management would need to be in place" when livestock are removed, weed management will only increase "as funding allows". Funding for weed management needs to be a higher priority than building fences and other range improvements. If there is funding for one or the other, the livestock are fewer in number and more easily removed than weedy alien plant taxa. NPS needs to commit to a funding level for weed management.
- A. *The NPS has identified monies for development of a weed management plan and expanded control efforts for two years. The NPS will not put money into building fences or other range improvements; those costs are borne by the permittee.*
- Q. Allowing cattle to remain on the island until 2011 is not offering a solution to the weed management problem; it is merely putting off a funding problem.
- A. *The final Proposed Action does not identify weed control as a reason to permit cattle in any pastures.*
- Q. The cost of weed management may be greater with the commercial ranching and hunting operation than without, and may increase steadily the longer livestock are on Santa Rosa Island. Weedy species control may be more difficult with alien animals and accelerated erosion.
- A. *We agree. Most weedy plants flourish in disturbed areas and bare ground opened by trampling and grazing. The NPS will focus weed control efforts on species which are not dependent on disturbance and are able to expand into relatively undisturbed native vegetation communities.*

Issue: Eradication of Alien Annual Grasses

Comment Letters: California Native Plant Society (Roberson), Multiple Use Managers, Inc., Elizabeth L. Painter

RESPONSE TO PUBLIC COMMENTS

- Q. Although the majority of SRI is dominated by weedy annual species which have replaced native grasslands and shrublands, the DEIS does not treat these weedy annual species as undesirable species, nor does it propose any measures to manage them. The Park should consider prescribed fire, carefully timed grazing, and manipulation of soil chemistry as management measures for controlling annual grasses.
- A. *Under the Proposed Action in this Final RMP/EIS, the influence of non-native annual grasses would be reduced by removal of cattle from pastures, followed by application of active restoration techniques such as prescribed fire to encourage establishment of native vegetation.*
- Q. Without grazing, some of the non-native grasses could well out-compete the native grasses and crowd them out.
- A. *The native grasses on Santa Rosa Island are not adapted to grazing pressure and tend to be outcompeted by the non-natives when grazing pressure is heavy. The most substantial remnants of native grasses occur in areas of lower livestock use. That said, the NPS will need to take efforts to assist the restoration of native grasslands. Fire has been used successfully at other locations in California as a tool to reduce competition from non-natives and encourage establishment of native vegetation.*

Wilderness

Issue: Effects of the Alternatives on Wilderness Values

Comment Letters: Santa Barbara Urban Creeks Council, Craig Dremann

- Q. Only Alternative E keeps future options open by not precluding Wilderness designation in the near term. The other alternatives foreclose Wilderness designation for 15 years.
- A. *It is true that implementation of Alternative E would allow NPS to sooner evaluate wilderness suitability for Santa Rosa Island, since conditions would return to near-natural states most quickly. However, the other alternatives, including the Proposed Action, do not preclude eventual wilderness designation for the island.*

The Park's general management plan (1984) summarized the problems with assessing wilderness suitability for islands with livestock operations:

Santa Rosa and Santa Cruz islands...do not meet wilderness criteria for a variety of reasons, including the presence of domestic livestock and exotic grazing animals. The extent of resource disturbance is so great, and the results of removal of ranching and exotic species are so unpredictable, that it will be necessary to actively conduct extensive research and management programs during the first phases of recovery. This will require the interim retention of access roads and airstrips, thus precluding immediate wilderness designation.

Consequently, formal wilderness studies and recommendations for all of the islands will be deferred until predominantly natural conditions have been

RESPONSE TO PUBLIC COMMENTS

restored and no further intensive resource management efforts are needed. In the meantime, natural areas will be managed to the extent feasible as wilderness so as not to preclude later qualification for such designation.

Q. If wilderness designation does not hinge on presence or absence of cattle (many lands designated as wilderness are grazed) but on absence of human structures, roads, etc., then how can continued grazing affect wilderness suitability for Santa Rosa Island?

A. *The presence of cattle, per se, would not preclude wilderness designation for Santa Rosa Island, but the extensive island road network does. Until the commercial ranching and hunting operation ceases, vehicle use of the island's roads will continue at current levels. Wilderness suitability could be better determined following phased reduction of the permittee's commercial activities.*

Wildlife

Issue: Status and Trend of Wildlife Populations on Santa Rosa Island

Comment Letters: Natural Resources Conservation Service, California Cattleman's Association, National Parks and Conservation Association, Santa Barbara Urban Creeks Council, Gary M. Fellers, Elizabeth L. Painter

Q. If pre-ranching population levels of wildlife are not known, then the effects of ranching on those species are not known, either. There is no evidence that grazing and browsing poses the threats of habitat loss and degradation to species such as the spotted skunk.

A. *It is true that pre-ranching population levels of wildlife are not known. However, NPS has reviewed substantial information regarding the alterations to, and degradation of, vegetation, wetland, and fresh water communities by non-native ungulates (such impacts are described in the Environmental Consequences and Affected Environment chapters of this plan). Because wildlife depend on these habitats, they have been indirectly impacted by non-native ungulates.*

Q. The Draft RMP/EIS contains scant information regarding native mammals, reptiles, amphibians and invertebrates.

A. *There has been very little research regarding wildlife on Santa Rosa Island.*

Q. Has the island ever supported steelhead or other native fish including stickleback or chub? How would the alternatives affect potential restoration of steelhead in island streams?

A. *There is no information to indicate that steelhead, or other native fish, ever occurred in island streams.*

Issue: Effect of the Alternatives on Wildlife

Comment Letters: Santa Barbara Urban Creeks Council, Gary M. Fellers, Elizabeth L. Painter

RESPONSE TO PUBLIC COMMENTS

- Q. The Draft RMP/EIS does not adequately discuss the relative impacts of the various alternatives on island wildlife. Most of the statements concerning wildlife in the Draft RMP/EIS have little support in terms of either published or unpublished research.
- A. *Comment noted. There has not been extensive research on the wildlife of Santa Rosa Island. Much more information is available on the island's vegetation communities and the impacts of ungulates on those communities. The final Proposed Action will permit the early recovery of vegetation communities and wildlife habitat, in significant portions of Santa Rosa Island.*
- Q. Which alternative would best mitigate the impact of cattle on wildlife by creating migration corridors and providing food and cover sooner? Alternatives A through D are inadequate because they fail to provide continuous migration and gene flow corridors between habitats and areas.
- A. *Comment noted. The final Proposed Action provides for early phase-out of ungulates from the most sensitive portions of the island. These areas should provide significant habitat for recovery of wildlife populations.*
- Q. NPS documents identify several invertebrates as candidates for federal listing, including the Channel Islands dune beetle (*Coelus pacificus*) and the globose dune beetle (*Coelus globosus*). However, no invertebrates are mentioned in the Draft RMP/EIS. Does this mean that the taxa are no longer candidates, that it is known that alien livestock have no impacts, or that they are the subject of another EA or EIS?
- A. *There are no invertebrate species on Santa Rosa Island that are candidates for federal listing.*

PREPARERS AND CONSULTANTS

INTERDISCIPLINARY TEAM (DEVELOPMENT OF ALTERNATIVES)

Tim Coonan	Branch Chief for Terrestrial Monitoring and Restoration	National Park Service Channel Islands National Park
Gary Rosenlieb	Hydrologist	National Park Service Water Resources Division
John Bechtold	District Conservationist	Natural Resources Conservation Service
Gary Montgomery	Range Conservationist	U.S. Forest Service Los Padres National Forest
Cece Sellgren	Range Conservationist	National Park Service Channel Islands National Park
Connie Rutherford	Botanist	U.S. Fish and Wildlife Service Ventura Field Office
Karen Danielsen	Botanist	U.S. Forest Service Los Padres National Forest
Laurie Johnson	Botanist	National Park Service Channel Islands National Park

PLANNING TEAM (IMPACT ANALYSIS AND WRITING)

Tim Coonan	Branch Chief for Terrestrial Monitoring and Restoration	National Park Service Channel Islands National Park
Cece Sellgren	Range Conservationist	National Park Service Channel Islands National Park
Laurie Johnson	Botanist	National Park Service Channel Islands National Park
Greg Austin	Wildlife Biologist	National Park Service Channel Islands National Park
Don Morris	Cultural Resources Specialist	National Park Service Channel Islands National Park
Lee Anne Naue	Environmental Specialist	Environmental Protection Agency

APPENDICES

APPENDIX A RECENT HISTORY OF LIVESTOCK USE OF SANTA ROSA ISLAND

Development of Recommended Stocking Levels by Pasture

Bartolome and Clawson (1992) and Evett and Bartolome (1992) estimated grazing capacity for Santa Rosa Island, by scorecard and geographic information system analysis (GIS), respectively. The scorecard method is based on estimated forage production and recommended residual dry matter (RDM) under proper grazing use. Bartolome and Clawson used existing maps of elevations, vegetation communities (Clark et al. 1990), and pasture boundaries to estimate annual grazing capacities in each pasture for both “average” precipitation years and “poor” years (annual precipitation less than 10 inches was considered to be a poor year). Evett and Bartolome revised those estimated grazing capacities using GIS coverages. Their revised estimates of grazing capacity are given in Table 20, and form the basis for the stocking levels prescribed in this plan (see Alternative D, Revised Conservation Strategy (the Proposed Action)).

Table 21. Estimated grazing capacity by pasture for Santa Rosa Island, from Evett and Bartolome (1992).

Pasture	Area (acres)	Grazing Capacity (AUM's)	
		Average Year	Poor Year
Carrington	1,177	1,234	467
Lobo	1,268	1,419	538
Horse	363	270	102
North	13,847	11,150	4,231
South	24,334	13,682	6,218
Pocket	7,054	8,973	3,513
Wire	1,638	1,094	391
Old Ranch	3,732	2,719	1,120
Wreck Trap	361	197	84
Arlington Trap	323	363	152
TOTAL	54,098	41,102	16,816

Recent Stocking History on Santa Rosa Island

Vail & Vickers have recorded actual use figures for the entire island (Table 21), and since 1987 they have reported them on a monthly basis to the Park. Evett and Bartolome’s estimates of annual grazing capacity correspond well with actual use figures from recent years. Since 1987, total AUM’s have averaged 40,476, which is slightly less than Evett and Bartolome’s estimated 41,102. However, the latter estimate is for “good “ years, when precipitation is greater than 10 inches. If the two “poor” years of 1989 and 1990 are disregarded, then average annual usage on Santa Rosa Island is 43,961 AUM’s. This is still an underestimate of usage, since AUM’s for horses (one horse = 1.2 Animal Units) are not reported. Nonetheless, the relative conformance of actual use numbers to estimated grazing capacity validates the use of Evett and Bartolome’s

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numbers as reference points for setting pasture stocking levels and as the starting point for pasture-specific reductions in stocking rate.

Table 22. History of recent livestock use on Santa Rosa Island. Precipitation data is from Beecher's Bay, Vail & Vickers ranch records.

Year	Precip. (in.)	Annual AUM's		
		Cattle	Elk	Total
1980	21.20	32,238		
1981	13.58	27,748		
1982	12.19	35,003		
1983	26.84	38,271		
1984	10.32	35,624		
1985	11.95	41,571		
1986	25.74			
1987	11.14	45,564	6,036	51,600
1988	18.53	46,464	5,868	52,332
1989	6.32	34,392	5,328	39,720
1990	5.66	12,685	4,152	16,837
1991	14.94	37,767	3,300	41,067
1992	19.67	29,354	4,476	33,830
1993	21.57	34,882	4,824	39,706
1994	14.49	40,566	5,077	45,643
1995	43.28	36,967	6,580	43,547
1996				
AVG	15.61	35,152	5,071	40,476

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APPENDIX B RARE PLANTS OF SANTA ROSA ISLAND

SCIENTIFIC NAME	COMMON NAME	HABITAT	STATUS					OCCURRENCE				
			Fed	State	CNPS	R-E-D	NPS	AI	SCI	SRI	SMI	SBI
<i>Abronia maritima</i>	red sand verbena	D			4	1-2-2	X		C	R		
<i>Achillea millefolium (pink form)</i>	island yarrow	CB,G,CS,C					EE	A	C	R	M	
<i>Acnatherum diegoense</i>	San Diego needlegrass	G,CS,C,TP			4	1-2-1	X	A	C	R	M	
<i>Adenostoma fasciculatum v. prostratum</i>	prostrate chamise	C					EE,hl		C	R		
<i>Aphanisma blitoides</i>	aphanisma	CB,CS	C2		1B	2-2-2	X	A	C	R	M	B
<i>Arabis hoffmannii</i>	Hoffman's rock cress	CB	pE		1B	3-3-3	EE, X		C	R		
<i>Arctostaphylos confertiflora</i>	Santa Rosa Island Manzanita	C,W,BP,TP	pE		1B	2-2-3	E, X, hl			R		
<i>Arctostaphylos insularis</i>	island manzanita	C			#		E, hl		C	R?		
<i>Arctostaphylos tomentosa s. insulicola</i>	island manzanita	C,BP,TP			4	1-2-3	EE, X, hl		C	R		
<i>Astragalus miguelensis</i>	island locoweed	D,CB			4	1-1-3	EE, X	A	C	R	M	
<i>Atriplex argentea s. expansa</i>	silverscale	CB,CS					CA		C	R		
<i>Atriplex coulteri</i>	Coulter's saltbush	CB,CS,G			1B	2-2-2	X	A	C	R	M	
<i>Atriplex seranana v. davidsonii</i>	Davidson's bractscale	G			1B	3-2-2	X		C	R		
<i>Berberis pinnata s. insularis</i>	island barberry	W,P,CS	pE	E	1B	3-2-3	EE, X, hl	A!	C	R!		
<i>Boschniakia californica</i>	California ground-cone	C					1*, hl			R		
<i>Calandrinia breweri</i>	Brewer's calandrinia	C,CS			4	1-2-2	X		C	R		
<i>Calandrinia maritima</i>	seaside calandrinia	CB,G			4	1-2-1	X	A	C	R		B
<i>Calochortus albus</i>	fairy lantern; globe lily	C					hl		C	R		
<i>Calochortus catalinae</i>	Catalina mariposa	CS,W,C,G			4	1-2-3	X, hl		C	R		

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SCIENTIFIC NAME	COMMON NAME	HABITAT	STATUS					OCCURRENCE				
			Fed	State	CNPS	R-E-D	NPS	AI	SCI	SRI	SMI	SBI
<i>Calystegia macrostegia s. macrostegia</i>	island morning glory	CB,CS,G					EE	A	C	R	M	
<i>Castilleja mollis</i>	soft-leaved paintbrush	CB,D	pE		1B	3-3-3	E, (EE?), X, hl			R	M?	
<i>Castilleja lanata s. hololeuca</i>	island paintbrush	CB,CS,C	C3c		1B	2-2-3	EE, X	A	C	R	M	
<i>Ceanothus arboreus v. glaber</i>	SRI wild lilac	C,BP,TP			#		E, hl			R		
<i>Ceanothus megacarpus s. insularis</i>	island big-pod wild lilac	C			4	1-1-3	EE, X, hl	A	C	R	M!	
<i>Ceanothus megacarpus s. megacarpus</i>	big-pod wild lilac	C					hl	A	C	R	M!	
<i>Cercocarpus betuloides v. blanchaeae</i>	island mountain mahogany	C			4	1-1-3	EE, X, hl		C	R		
<i>Chorizanthe wheeleri</i>	Wheeler's chorizanthe	C, CS			4	1-1-3	EE, X,, hl		C	R		
<i>Clematis ligustifolia</i>	creek clematis	RW					hl		C	R		
<i>Comarostaphylos diversifolia s. planifolia</i>	summer-holly	C,W					EE, hl,	A	C	R		
<i>Coreopsis gigantea</i>	giant coreopsis	B			#		2*	A	C	R	M	B
<i>Dendromecon rigida ssp. harfordii</i>	island tree poppy	CS,C	C2		4		EE, X, hl		C	R		
<i>Dichondra occidentalis</i>	western dichondra	C,CB,W,CS,G	C3		4	1-2-1	X, CA, hl		C	R	M	
<i>Dodecatheon clevelandii s. insulare</i>	island shooting star	C,G					hl	A	C	R	M	
<i>Dryopteris arguta</i>	wood fern	W,R					4*, hl	A	C	R	M	
<i>Dudleya blochmaniae s. insularis</i>	Santa Rrosa Island live-forever	CB,CS	pE		1B	3-3-3	E, X, hl			R		
<i>Dudleya candelabrum</i>	candleholder dudleya	CS,CB,BP	C2		1B	2-2-3	EE, X, hl		C	R	M!?	
<i>Dudleya greenei forma nova</i>	Munchkin live-forever	CB	F-PE				E, X, hl			R		

FINAL RESOURCES MANAGEMENT PLAN FOR SANTA ROSA ISLAND

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SCIENTIFIC NAME	COMMON NAME	HABITAT	STATUS					OCCURRENCE				
			Fed	State	CNPS	R-E-D	NPS	AI	SCI	SRI	SMI	SBI
<i>Dudleya greenei</i>	Greene's live-forever	CB			4	1-2-3	EE, X,		C	R	M	
<i>Erigeron sanctarum</i>	saint's daisy	C,W,CS			4	1-2-3	X, hl		C	R		
<i>Eriogonum arborescens</i>	Santa Cruz Island buckwheat	CS,C,G			#		EE, hl	A	C	R		
<i>Eriogonum cinereum</i>	ashy-leaved buckwheat	CS					hlCB, hl			R		
<i>Eriogonum grande v. grande</i>	island buckwheat	CB,CS,G			4	1-2-3	EE, X, hl	A	C	R		
<i>Eriogonum grande v. rubescens</i>	red buckwheat	CB,CS,G	C2		4	1-2-3	EE, X, hl		C	R	M	
<i>Erysimum ammophilum</i>	coast wall-flower	D	C2		1B	2-2-3	X, hl		C	R		
<i>Erysimum insulare s. insulare</i>	island wallflower	CB,D	C2		1B	2-1-3	EE, X, hl	A	C	R	M	
<i>Eschscholzia ramosa</i>	island poppy	CB,C,CS	C3		4	1-1-2	EE, X, hl		C	R		B
<i>Galium angustifolium s. foliosum</i>	narrow-leaved bedstraw	CB,C,CS,O,W						A	C	R		
<i>Galium buxifolium</i>	sea-cliff bedstraw	CS	pE	R	1B	3-2-3	EE, X, hl		C	RI?	M	
<i>Galium californicum s. miquelense</i>	San Miguel Island bedstraw	CB,W	C3		4	1-2-3	EE, X, hl			R	M	
<i>Galium nuttalli s. insulare</i>	island bedstraw	C,CS,O,P,W			4	1-1-3	EE, X, hl		C	R		
<i>Gilia tenuiflora s. hoffmannii</i>	Hoffmann's slender-flowered gilia	D,CB	pE	T	1B	3-1-3	E, X, hl			R		
<i>Hazardia detonsa</i>	island hazardia	CS,CB			4	1-1-3	EE, X, hl	A	C	R		
<i>Helianthemum greenei</i>	island rush-rose	C	pE		1B	3-2-3	EE, X, hl		C	RI?	M!	
<i>Helianthemum scoparium</i>	rushrose	C					hl		C	R		
<i>Hemizonia clementina</i>	island tarplant	CB, G,CS			4	1-1-3	EE, X, hl	A	C	R		B
<i>Heteromeles arbutifolia</i>	toyon	C,W					hl	A	C	R	M	
<i>Heuchera maxima</i>	island alum-root	CB,W,O,BP,R	pE		1B	2-2-3	EE, X, hl	A	C	R		
<i>Hordeum intercedens</i>	little barley, vernal barley	G,V			3	?-2-2	X, hl	A	C	R	M	B
<i>Isomeris arborea</i>	bladderpod	CS					hl			R		

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SCIENTIFIC NAME	COMMON NAME	HABITAT	STATUS					OCCURRENCE				
			Fed	State	CNPS	R-E-D	NPS	AI	SCI	SRI	SMI	SBI
<i>Jepsonia malvifolia</i>	island jepsonia	C, TP,CS,BP,O	C2		4	1-1-2	EE, X, hl		C	R		
<i>Lasthenia glabrata s. coulteri</i>	Coulter's goldfields	M	C2		1B	2-3-2	X, hl			R		
<i>Lavatera assurgentiflora s. assurgentiflora</i>	island tree mallow	CB,D	pE		1B	3-3-3	EE, X, hl	A	C*	R*	M	
<i>Lepechinia fragrans</i>	fragrant pitcher-sage	C			4	1-2-3	hl		C	R		
<i>Lessingia filaginifolia v. filaginifolia</i>	cudweed aster	C					hl		C	R	M	
<i>Lilium humboldtii v. ocellatum</i>	ocellated Humboldt lily	W,C,O,BP,TP,CS	C2		4	1-2-3	X, hl	A	C	R		
<i>Lotus dendroideus v. dendroideus</i>	island deerweed	CB,CS,BP,W			4	1-2-3	EE, X, hl	A	C	R		
<i>Lycium fremontii</i>	Fremont's boxthorn	CB,CS					hl			R		
<i>Lyonathamnus floribundus s. aspleniifolius</i>	Santa Cruz Island ironwood	W,C	C2		1B	3-2-3	EE, X, hl		C	R		
<i>Malacothrix incana</i>	dune dandelion	D			4	1-1-3	EE, X, hl		C!	R	M	
<i>Malacothrix indecora</i>	Santa Cruz Island chicory	CB,C,D	pE		1B	3-3-3	EE, X,	A	C	R	M	
<i>Malacothrix saxatilis v. implicata</i>	cliff aster	B, D, CS					EE, hl	A	C	R	M	
<i>Mimulus flemingii</i>	island monkeyflower	C,CB			4	1-1-3	EE, X, hl	A	C	R		
<i>Minuartia douglasii</i>	Douglas' sandwort	C					HL		C	R		
<i>Opuntia prolifera</i>	coastal cholla	CS					CA	A	C	R		B
<i>Orobanche parishii s. brachyloba</i>	short-lobed bromrape	CB,D,CS	pE		1B	2-2-2	3*, hl		C	R	M	
<i>Pentagramma triangularis</i>	gold-back fern	W, RW					4*, hl	A	C	R	M	
<i>Petunia parviflora</i>	wild petunia	CS,RH					CA			R		
<i>Phacelia insularis s. insularis</i>	northern islands phacelia	D,G	pE		1B	3-2-3	EE, X, hl			R	M	
<i>Pinus muricata forma remorata</i>	Santa Cruz Island pine	BP					EE, hl		C	R		

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SCIENTIFIC NAME	COMMON NAME	HABITAT	STATUS					OCCURRENCE				
			Fed	State	CNPS	R-E-D	NPS	AI	SCI	SRI	SMI	SBI
<i>Pinus torreyana s. insularis</i>	Santa Rosa Island Torrey pine	TP,C	C2		1B	3-2-3	E			R		
<i>Piperia elegans</i>	rein orchid	C			#		hl		C	R		
<i>Populus balsamifera v. trichocarpa</i>	black cottonwood	RW					hl		C	R		
<i>Prunus ilicifolia s. lyonii</i>	island cherry	W,RW			#		EE, hl	A	C	R		
<i>Quercus agrifolia v. agrifolia</i>	coast live oak	G,O,RW					hl		C	R		
<i>Quercus engelmannii</i>	Engelmann's oak	O,RW,C,G			4	1-2-2	X, hl			R		
<i>Quercus pacifica</i>	island scrub oak	C,CS,O,BP,TP					EE, hl		C	R		
<i>Quercus tomentella</i>	island oak	C,O,BP,RW,W			4	1-2-2	EE, X, hl,lr	A	C	R		
<i>Quercus x macdonaldii</i>	Macdonald's oak	C,G,O			#		hl		C	R		
<i>Rhamnus pirifolia</i>	island redberry	C,CS,O,BP,TP, RW					EE, hl		C	R	M!	
<i>Rosa californica</i>	California wild rose	RW,CS,O,TP,B					hl		C	R		
<i>Rubus ursinus</i>	California blackberry	O,BP,W,RW					hl		C	R	M	
<i>Salix lasiolepis</i>	arroyo willow	RW					hl	A	C	R	M	
<i>Salvia brandegei</i>	Brandegee's sage	CS,C,P	C3		1B	2-2-2	3*			R		
<i>Salvia mellifera</i>	black sage	CS					hl	A	C	R		
<i>Sambucus mexicana</i>	southern elderberry	RW					hl		C	R		
<i>Sanicula hoffmannii</i>	Hoffmann's snakeroot	C, W?, O?	C3c		4	3-3-3			C	R		
<i>Selaginella bigelovii</i>	Bigelow's clubmoss	C,BP,TP,CS					hl	A	C	R		
<i>Senecio aphanactis</i>	California groundsel	CS,W,G			2	3-2-1	X, CA, hl		C	R		
<i>Solanum clokeyi</i>	northern islands nightshade	W			4	1-2-3	EE, X, hl		C	R		
<i>Stylomecon heterophylla</i>	wind poppy	G,CB,CS					CA	A	C	R	M	B
<i>Suaeda taxifolia</i>	wooly sea-blite	CB,M			4	1-2-1	X, hl	A	C	R	M	B

APPENDICES

SCIENTIFIC NAME	COMMON NAME	HABITAT	STATUS					OCCURRENCE				
			Fed	State	CNPS	R-E-D	NPS	AI	SCI	SRI	SMI	SBI
<i>Thysanocarpus lacinatus</i>	narrow-leaved lacepod	C,G,O,BP,TP					hl		C	R		
<i>Vaccinium ovatum</i>	evergreen huckleberry	C					hl		C	R		
TOTAL										71		

This table is a compilation of several sources of information. Included are:

- 1) All plants of C.I.N.P. which have been given legal protection by federal or California governments, are being considered for such listing, have been considered but rejected for listing, for various reasons.
- 2) All plants of C.I.N.P. designated by the California Native Plant Society as species of special environmental concern.
- 3) All plants of C.I.N.P. which are endemic only to one or more of the islands.
- 4) All plants of C.I.N.P. which were noted as species of special environmental concern by the botanists in attendance at the first Channel Islands Conservation Agreement meeting. (title, date needed)
- 5) Members of the Island Chaparral plant community, which has been/continues to be severely impacted by feral herbivores on one or more islands.

Plant community designations are based on those used in the CNPS *Inventory of Rare and Endangered Vascular Plants of California*, and those used in *A Flora of Santa Cruz Island*, by Junak, et al.

LEGEND:

Occurrences:

- A,C,R,M,B = Island(s) of occurrence.
- * = Plant is native to one or more islands, but introduced to the island(s) so indicated.
- ! = In combination with an island-designating letter, indicates that the plant must be presumed extinct on the island(s) indicated
- + = species is endemic to one island
- ++ = species is endemic to several islands

Plant Communities:

- BP = Bishop pine woodland
- C = Island chaparral
- CB = Coastal bluff scrub
- CS = Coastal Scrub (includes coastal sage, maritime cactus scrub)
- D = Southern beach & dune
- G = Valley and Foothill Grassland
- M = Coastal marsh and estuary
- O = Southern coastal oak woodland (*Quercus agrifolia* v. *agrifolia*, *Heteromeles arbutifolia*, *Toxicodendron diversiloba*)
- RH = Riparian herbaceous
- RW = Southern riparian woodland
- TP = Torrey pine woodland
- W = Island woodland (*Heteromeles arbutifolia*, *Lyonothamnus aspleniifolius*, *aspleniifolius*, *Prunus ilicifolia* s. *lyonii*, *Quercus tometella*)

APPENDICES

V = Vernal ponds

Rarity Designations:

Federal

- E Endangered
- pE proposed Endangered
- T Threatened

C1 This category was recently eliminated by USFWS, but we have retained it here to designate a degree of concern about the species' status.

C2 This category was recently eliminated by USFWS, but we have retained it here to designate a degree of concern about the species' status.

C3 Considered for listing, but listing not pursued.

re removed from consideration

California

- E Endangered
- T Threatened
- R Rare

California Native Plant Society (CNPS)

- 1A plants that are presumed extinct in California
- 1B plants that are rare, threatened, or endangered in California and elsewhere
- 2 plants that are rare, threatened, or endangered in California, but more common elsewhere
- 3 plants about which we need more information—a review list
- 4 plants of limited distribution—a watch list

Considered but not designated—more common than previously realized

R-E-D Code: A three-part code quantifying the conditions of rarity (R), endangerment (E), and distribution (D). Scale for each component ranges 1-3, with 3 being the most severe degree of the condition

National Park Service (NPS)

All the plants with any of the above designations are automatically included on the NPS list of "sensitive plant species". In addition, we include:

- X denoted as rare by federal, state, or CNPS systems
- E single-island endemic
- EE several-island endemic
- CA noted by botanists participating in Conservation Agreement meetings
- hl severely impacted by habitat loss or degradation
- lr low reproduction
- 1*, 2*, etc. Noted as rare in another context. See specific footnotes

APPENDIX C AGENCY COMMENT LETTERS

[Faint, illegible text from the left side of the page, likely bleed-through from the reverse side of the document.]

Conan

STATE OF CALIFORNIA

PETE WILSON, Governor

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD —
CENTRAL COAST REGION
81 HIGUERA STREET, SUITE 200
SAN LUIS OBISPO, CA 93401-5414
(805) 549-3147



NATIONAL PARK	
Received	
_____	Supt.
_____	Asst. Supt.
_____	Admin.
_____	Interp.
_____	Maint.
_____	Rangers
_____	Res. Mgt.

6/19/96

June 17, 1996

Mr. Tim J. Setnicka, Acting Superintendent
Channel Islands National Park
1901 Spinnaker Drive
Ventura, CA. 93001

**NATIONAL PARK SERVICE SANTA ROSA ISLAND - RESOURCES MANAGEMENT PLAN-
ENVIRONMENTAL IMPACT STATEMENT (RMP-EIS)**

Dear Mr. Setnicka:

Thank you for the Resources Management Plan and the Environmental Impact Statement (RMP-EIS, April 1996). We have reviewed the document with respect to Cleanup or Abatement Order 95-064 and our comments are discussed below.

General Comments On The Resources Management Plan and the Environmental Impact Statement

None of the proposed alternatives address impacts to water quality from existing road maintenance practices. The RMP-EIS (page 20) states that "Best management practices for road management would continue to be implemented." However, Board staff are concerned that current road management practices employed by the National Park Service are significantly harming water quality. Your revised draft report must address road management issues and how the National Park Service intends to comply with the conditions of Cleanup or Abatement Order No. 95-064 (CAO). Simply stating best management practices will continue to be used is unacceptable. The intent of the CAO was to have the National Park Service evaluate current management practices and adopt improved management practices to protect and enhance beneficial uses of water quality.

The time schedule contained in the RMP-EIS does not provide specific dates for completion of implementation actions. Under the conditions of the CAO, the plan submitted to me must contain a time schedule for completion of implementation actions detailed in the plans and document compliance with conditions of the Order. Your revised draft report must contain a timeline with specific dates for completion of implementation actions.

The RMP-EIS proposes various alternatives and management measures for selected areas on Santa Rosa Island. The range of alternative management measures discussed in the RMP-EIS

National Park Service, RMP-EIS

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June 17, 1996

includes: selected pasture closure, riparian exclosures, deer removal, elk herd reduction, weed management, rotation grazing, water development, residual dry matter management, and phased removal of grazing.

The Regional Board supports implementation of various management measures for protection and enhancement of water quality on Santa Rosa Island. However, several management measures in each alternative may need to be modified to maximize water quality protection and enhancement.

Comments Specific to Selected Alternative C

When compared to existing management practices utilized for the protection and enhancement of water quality on Santa Rosa Island, the implementation of alternative C would have a beneficial impact on water quality. However, we have concerns regarding the specifics of selected management measures.

Alternative C proposes to implement selected management practices for specific waterbodies over a fifteen year period. This will allow for continued unabated impact on most surface waters for the next fifteen years. This is not acceptable. Your revised draft report must contain proposed actions to protect and/or enhance water quality for a majority of waters on Santa Rosa Island over the next fifteen years.

Alternative C proposes to close Old Ranch pasture to cattle and horses. Permanent closure of this pasture will result in a permanent decrease of approximately 7% in the pasture land available for grazing. This action has the potential to protect and enhance water quality in this pasture, but it may present a significant impact to the ranching operations. It may be prudent to close this pasture for a set period to allow recovery, and then reopen the pasture for a limited time to make utilization of the forage. However, when the field is open to grazing, management measures to protect and enhance water quality must continued to be implemented.

Alternative C proposes to split North pasture (becoming Black Mountain and Brockway pastures) and implement a rotation grazing program. The rotation grazing program would be augmented by construction of three water developments. Splitting North pasture (13,847 acres) into two areas will result in two pastures of approximately 7,000 acres each. Coupled with rotation grazing, this will afford a rest period for both Black Mountain and Brockway pastures. However, there is potential for continued significant impact to water quality when these areas are subjected to six months of continuous grazing. If the rotation grazing has potential to impact water quality, the Board may propose that additional mitigation measures be implemented. Additionally, we suggest that other pastures be incorporated into the rotation grazing program. This will provide benefit to the ranch operation, increase the amount of area rested on the island, and support protection and enhancement of water quality island-wide.

National Park Service, RMP-EIS

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June 17, 1996

Alternative C proposes construction of nine small riparian exclosures. The proposed exclosures may encompass a total of 90 to 720 acres. Although the exclosures may protect existing riparian vegetation and serve as nursery stock areas, the protection and enhancement of beneficial uses may be limited. We suggest that larger areas be targeted for use as riparian pasture in a rotation grazing program. This will provide benefit to the ranch operation, increase the amount of area rested on the island, and support protection and enhancement of water quality.

Alternative C proposes the removal of all deer by 1999 and a reduction in the elk herd from the current level of 1100 to 450 by 2002. We support this action. The reduction of grazing animals (deer, or elk) on Santa Rosa Island has the potential to protect and enhance water quality.

Alternative C proposes to modify grazing management to raise residual dry matter (RDM) from 400 to 1000 pounds per acre (lbs/ac). We support this action. Increase of RDM on Santa Rosa Island pasture lands has good potential to benefit to water quality protection and enhancement.

Alternative C proposes an expanded weed management program. We need additional information on this management measure before supporting the program. If the program has potential to impact water quality (through the use of herbicides or removal of significant stands of vegetation protecting soils), the Board may propose additional mitigation measures be implemented.

Alternative C proposes to change the water quality monitoring program from monthly to annual. The Regional Board is not opposed to modifying the monitoring program to improve the type and quality of data collected. However, until the monitoring program is modified, the National Park Service must continue to monitor as detailed by condition D of CAO 95-064. The Monitoring program shall not be altered until the Regional Board approves a modified monitoring program developed by the National Park Service.

Finally, implementation of actions proposed in selected alternative C do not begin until some time in 1997. This is not acceptable. This will allow unabated continued water quality degradation for an undetermined period. Your revised draft report must contain a time schedule to begin implementation of actions in August 1996.

The intent of the CAO is to encourage implementation of improved management measures to protect and enhance water quality. The Order does not prohibit grazing or other activities necessary to run a commercial ranching operation. The Order does not prohibit actions necessary to manage Santa Rosa Island as a National Park. The Order does state that management measures used by the National Park Service and their permittees must be implemented in a manner consistent with water quality protection and enhancement.

FINAL RESOURCES MANAGEMENT PLAN FOR SANTA ROSA ISLAND
APPENDICES

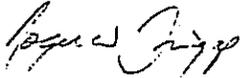
National Park Service, RMP-EIS

-4-

June 17, 1996

If you have any questions, please call Howard Kolb at (805) 549-3332 or Vern Jones at (805) 542-4629 between the hours of 8:00 a.m. and 5:00 p.m.

Sincerely,



Roger W. Briggs
Executive Officer

cc: Interested Parties List attached

HEK/ops/implementation/tier3/santarosa/letters/rmp/eis.doc

FINAL RESOURCES MANAGEMENT PLAN FOR SANTA ROSA ISLAND
APPENDICES

United States
Department of
Agriculture

Natural Resources
Conservation
Service

624B West Foster Rd
Santa Maria, CA 93455

SUBJECT: Draft RMP for Santa Rosa Island

TO: Superintendent
Attn.: RMP-EIS Coordinator
Channel Islands National Park
1901 Spinnaker Drive
Ventura, CA 93001

Received	
DATE:	August 7, 1996
<u>7/1</u>	Supt.
_____	Asst. Supt.
_____	Admin.
_____	Interp.
_____	Maint.
_____	Rangers
_____	Res. Mgt.
_____	NES-Mar
_____	INS-Terr

I would like to thank the National Park Service (NPS) for inviting me to be a part of the team responsible for putting this Resource Management Plan (RMP) together. After many months of work, it appears we have an alternative that, if fully implemented, will go a long way towards addressing the primary concerns of water quality and rare species, and will allow the ranch to continue operating. If requested, both the NRCS and the Cachuma Resource Conservation District would be more than willing to further assist the Park Service and the ranch with implementation.

Because of the nature of the document and the sensitive issues it addresses, the plan will undoubtedly generate a great deal of controversy, regardless of how it is written. Overall, I think the document over-estimates the adverse impacts CURRENT ranch operations are having on the island and the adverse impacts the preferred alternative will have.

At the same time, it underestimates, or totally ignores the adverse impacts some of the past and present activities of the NPS and other users are having on the island. EVERYONE (including Mother Nature), past and present, should be held accountable for the present condition of the island.

The tone of the RMP is clearly anti-cattle grazing. Throughout the plan, the NPS draws conclusions and speculates on cause and effect without any basis. This is in large part because the NPS has allowed the RMP to be written by a planning team consisting of individuals who have little or no experience in practical Range Management.

In addition, although I have not had the opportunity to review any of the literature cited in the bibliography, I would guess many of the conclusions reached in these papers have been misapplied to conditions on the island.

The following are some comments and suggestions I believe will make the plan less objectionable to some of the public and to the ranch.

Page i -

1. In second paragraph, change the second sentence to read, "...to protect riparian areas from the effects of concentrated and continuous summer grazing...".

Page v -

1. Under Alternative C, add this sentence following the fifth sentence: "Because cattle will be grazing Brockway during the cool, wet season, they will be less likely to concentrate in riparian areas. This should mitigate the effects of a higher seasonal stocking rate."

Page vi -

1. First sentence should be rewritten. It implies that the only way to improve water quality is to reduce the stocking rate. As stated under previous alternatives, just say that cattle will still have access to riparian areas in South and Black Mountain pastures. Delete the last half of this sentence.

Page viii -

1. Under Mitigation Required, NPS refers to the adverse impact to arch' sites as "possible" adverse impacts. I think you should also refer to the impacts to proposed and listed species as "possible" impacts. No one really knows for sure what impacts the preferred alternative will have on any of the resources of concern. This is another good reason for the USFW to immediately implement a monitoring program.
2. Under monitoring, add that proposed species and their habitats will also be monitored.

Page ix -

1. Under Alt. C, I would suggest removing the last sentence. This may not be the case. You could reword it to read, "Any possible localized erosion around water sources in Brockway and Black Mountain pastures due to the increased seasonal stocking density will be mitigated by implementing the rotational grazing system and carefully locating new water developments."
2. Also, the park should point out here that as long as archeologists, botanists, park service employees, and ranch hands, etc., continue to drive and walk all over the island, there will be continued adverse impacts to soils from the "trampling" of humans and vehicles, with resulting decreased soil stability, increased soil loss, etc.!! All the trampling on the island is not from ungulates. A large portion of it is human-induced. For example, during my brief visit to the island, I witnessed a substantial amount of gully erosion and soil instability due to improperly built roads and improperly placed and sized culverts.

Page x -

1. What are we "protecting" our streams from? Is it grazing, or is it seasonal concentrated continuous grazing? This page implies that the park service believes all grazing is harmful to riparian areas, and that riparian areas need to be "protected" from grazing. If this is the NPS's position, then by selecting an alternative that allows grazing in riparian areas, you are opening yourself up to criticism.
2. Add this statement after all alternatives: "Natural geological erosion and long-term climatic change may compound restoration efforts on the island."

Page xii -

In reference to the weed problems on the island, it will cost more to control weeds without cattle than with them. Most of the weed species the park is concerned about that are supposed to increase following removal of cattle are out there right now. On other islands, we have seen stands of 10 feet high fennel covering the hillsides after cattle were removed. In all likelihood, the stands of fennel were as DENSE when cattle were out there -- only the individual plants were a few inches tall. What better time to spray than when the individual plants are weakened by grazing.

I also think some statement should be made regarding the detrimental effect spraying may have on native vegetation and water quality. Many people are currently supporting the idea of spraying thousands of pounds of herbicides over thousands of acres to justify the claim that cattle are not needed to control weeds. After the cattle are removed, these same people will be protesting the use of herbicides on such a "delicate" environment. Regardless of whether cattle are removed or not, an aggressive weed control program needs to be implemented, and the program should use biological controls if available. Eventually, due to tougher regulations governing herbicides, and also due to the possibility of a public outcry against their use on the island, the park may have to find an alternative means of control.

In the Weeds section, I think this statement should be added to all the alternatives: "An expanded weed control program may contaminate ground and surface water, result in incidental taking of rare species, and pose a health risk to applicators, other people living on and visiting the island, and wildlife."

Page xiii -

1. Add the following somewhere on this page: "Long-term climatic change may compound attempts to restore some rare species." In the draft CSD on page 8, the PS states that "Regional changes in native species composition have resulted from major plant migrations accompanying climatic fluctuations." These fluctuations have included glacial episodes. It also states that, "A climatic period

considerably warmer and drier than that of today began on the islands approximately 7,000 years ago..." These islands have also geologically rafted every which way. I think there is enough scientific evidence that shows these islands have had their ups and downs as far as geology and weather. Based on this, the NPS would not be going out on a limb by suggesting that some of these rare species may be relics and may be disappearing on their own. There are some prominent botanists who would agree with this. Has the NPS consulted them?

Page xiv -

1. Under Alt. C, you state that vehicular traffic associated with the elk hunt would continue to offer the potential to impact arch' sites. What about all the other vehicular traffic, including that from archeologists driving out to study their own sites? This sentence should be removed. The impact is too insignificant to be worth mentioning.

This page grossly overestimates the impact cattle trampling has had on the sites, and does not even mention the impacts humans have had. I would bet more damage has been done, many times over, to these sites by archeologists and pothunters (humans) than cattle.

Page 3 -

Add change in climate to the list of threats (2nd par.).

Page 25 -

In the paragraph beginning "This alternative, ...", the last sentence implies this is the only alternative directed at improving habitat. This is clearly false. Alternative C is also clearly directed at habitat improvement. The last half of the last sentence in this paragraph should be deleted.

Page 30 -

If available, I would like the NPS to send me copies of all articles referenced on this page. Just by reading the titles of these articles, I believe the NPS may be misapplying some of their conclusions to the island.

It should be pointed out in this section that besides grazing by non-native ungulates, all the other activities of man have accelerated the erosion on the island, such as road building, vehicular traffic, etc.

Page 38 -

In the last paragraph, add "possible long-term climatic change" to the list of factors endangering proposed species.

Page 41 -

The sentence referring to cattle breaching the fence "protecting" plover nests from livestock should be eliminated. It has been demonstrated that a very small percentage of nest failures was due to trampling by livestock. I would guess the few times the cattle did get into the enclosure, no trampling of nests occurred, and if nests were destroyed, probably an insignificant amount.

Some groups may use this sentence to justify the claim that the only way to "protect" plover nests from livestock is to remove the livestock because enclosures do not work. In reality, the number of nest failures due to trampling is insignificant, even without the fence. The fact that on occasion, cattle have breached the fence is not even worth mentioning.

Page 42 -

It should be pointed out in the first paragraph that sites have also been degraded by the digging and trampling of humans, by all the associated vehicular traffic by everyone who uses the island, and by the actions of natural geologic erosion and weather. Otherwise, the first sentence should be eliminated. It implies that the only cause of degradation to sites is from livestock and pigs.

Page 46 -

The 1992 plan recommended the NPS implement a monitoring program for all areas of special concern and habitats for candidate species. I assume this monitoring program would have been designed and implemented in coordination with the USFW. Both agencies have had four years to complete this, but as yet have done very little. Had this monitoring program been developed and implemented four years ago, we would at least have some preliminary data which would help us answer the question of whether or not cattle grazing is having a detrimental impact on some of these rare species. If so, we could at least define the areas and extent, and take some RATIONAL steps to prevent any further negative impacts to affected areas and species.

Page 46 -

In the last paragraph, the grazing fee is mentioned. Due to the controversial nature of this fee, somewhere in this document, the NPS should explain how it is set. If I am correct, a formula was created as part of the 1976 Federal Land Policy and Management Act and the Public Rangeland Improvement Act in 1978. The formula establishes a fee by balancing the value of forage with the cost of production and market prices for livestock for that particular region and point in time. It is NOT established by comparing lease rates on private land or lease rates on dissimilar public land.

Considering the unique circumstances the Vale's operate under, and the current market price for beef, I would guess they are paying a very fair rate for their grazing. This should be made clear in the document.

Has anyone questioned the fees the NPS charges for other uses? Santa Rosa Island is continually being visited by campers, hikers, botanists, environmental groups, archeologists, etc. Many of these users are not required to pay any fee, although their activities do have some adverse impact on the island. Maybe the NPS should consider raising the fees on these uses to compensate for the resulting damage!

Page 48 -

In the paragraph on Soils, the clarification in the last sentence should be placed at the beginning of this paragraph. Also, it is not grazing that's the problem. It is CONTINUOUS grazing. I would suggest rewriting the first sentence to read, "Under this alternative, grazing under a continuous season-long grazing system in all pastures will maintain the current heavy effects on soils and biotic crusts in areas where cattle concentrate, such as around water sources, and in areas where ungulates trail"; then delete last sentence.

Page 49 -

In the first paragraph under Water Quality and Riparian Areas, the NPS is making a crisis out of the fact that only three cottonwood trees remain in Lobo Canyon. This species of cottonwood is not unique to the islands and is not endangered. Restoration efforts can reintroduce this species to the island at any time, using nursery material from the mainland.

Page 50 -

I think more detailed discussion should be included in the Vegetation section on which herbivore is having the heaviest impact on the shrub and chaparral/sage scrub communities. To begin with, the island was probably converted to grassland by a combination of hordes of sheep and some of man's activities (suppression of fire, etc.). The introduction of deer and pigs probably have done more to maintain or increase the grassland component than cattle. Deer are "edge" users, and prefer grazing and browsing where shrub and sage communities transition to grassland. It is in these areas that deer will have the heaviest impact on reproduction by utilizing seedlings and browsing (weakening) mature plants, thus preventing these communities from expanding. Rooting by feral pigs also caused substantial damage until they were eradicated. Although cattle may browse some shrub species, the amount is insignificant.

Cattle may be a factor in preventing these communities from expanding (they are certainly not the main cause if they are continuing to decline). In all likelihood other factors (past and present) are having a greater impact, and cattle might actually be having a net beneficial effect by removing competitive annual grasses. Along with browsing by deer, other factors affecting the survival of shrub and sage communities, where they locate, and where they can potentially expand would include changes in climate, differences in soil type, slope aspect (especially north facing versus south facing), and suppression of fire. I think it is time the NPS and USFW start monitoring these communities to quantify exactly what impact cattle really are having on them.

In the Wildlife section, does anyone know what the pre-European population levels were for these animals? Is there data that show current activities are having moderate effects on wildlife? If there is no reliable data, I do not believe the NPS should create a crisis where there is none. Simply state that current impacts to wildlife are not known.

Page 51 -

There is a lot of speculation in the last paragraph on this page. Does the NPS have any evidence supporting the claim that the raven population is directly related to the number of dead cattle scattered about the island? This is an example of environmentalists trying to find any way possible to blame the decrease in population of a rare species on the activities of humans, no matter how absurd.

Page 52 -

Under the Archeological Resources section, rewrite the last sentence to read, "In addition, natural erosion and erosion resulting from NPS and ranch activities will continue to..."

Page 53 -

Under the Summary section, the last sentence implies all the identified effects are due to cattle. This is clearly false. This document is also supposed to serve as an EIR, not just a management plan for ranch activities. Clearly, many of the park's present and past activities are also having a negative impact on resources. The last sentence should be deleted or reworded, possibly as follows: "Identified effects would continue until ranching operations cease in 2011 and until some of the detrimental activities of the NPS AND OTHER USERS are discontinued."

Pages 54 and 55 -

Again, the NPS is blaming all the island's woes on current ranching operations, as it has done throughout this entire document. By doing this, and then turning around and selecting an alternative that allows continued grazing, the NPS is leaving itself open to fierce criticism (and legal action) from the environmental community. I consider myself part of this community, and if I didn't know better, after reading this document, I would oppose the NPS's chosen alternative.

At this point, my comments will become redundant. The criticisms I have expressed so far could be applied to the following pages that describe the alternatives. In my opinion, this entire document is poorly written and will result in a great deal of criticism from everyone, much of which could have been avoided with minor changes in the language used.

In regard to page 73, in the second paragraph, the NPS has done an excellent job of criticizing its own preferred alternative, and without any basis. The last half of this paragraph should be deleted. None of what is being stated in these last four or five sentences is "likely" to happen.

The reality is no one knows for sure what effects any of these alternatives "may" have on the resources of concern. Had the NPS and USFW implemented a monitoring program years ago, we would at least have some idea at this point. Regardless of what happens with this RMP, the chosen alternative needs to be flexible and needs to include an aggressive monitoring program.

Finally, the public needs to be reminded over and over that all grazing on the island will cease in 2011, and it will have tens of thousands of years to "recover".

Sincerely,



John Bechtold
District Conservationist, USDA-NRCS

FINAL RESOURCES MANAGEMENT PLAN FOR SANTA ROSA ISLAND
APPENDICES



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IX

75 Hawthorne Street
San Francisco, CA 94105-3901

SEP 6 1996]

Stanley T. Albright, Field Director
Pacific West Area
National Park Service
600 Harrison Street
San Francisco CA 94107

Dear Mr. Albright:

The U.S. Environmental Protection Agency (EPA) has reviewed the Draft Environmental Impact Statement (DEIS) for IMPROVEMENT OF WATER QUALITY AND CONSERVATION OF RARE SPECIES AND THEIR HABITATS, SANTA ROSA ISLAND, CHANNEL ISLANDS NATIONAL PARK, CALIFORNIA. Our comments on the DEIS are provided pursuant to the National Environmental Policy Act (NEPA), Section 309 of the Clean Air Act, and the Council on Environmental Quality (CEQ) Regulations for Implementing NEPA (40 CFR 1500-1508). We offer the attached comments.

The National Park Service proposes actions to improve water quality in surface streams and to protect riparian habitat areas on Santa Rosa Island, and to promote the conservation and recovery of rare species of plants and animals on the island. Various actions to protect water quality are proposed, including the immediate closure of one pasture to cattle and horses; construction of a fence dividing another pasture with subsequent implementation of seasonal grazing rotation to protect riparian areas; construction of small riparian exclosures to protect key resources, establish nursery areas and protect water quality; removal of the island's deer herd and reduction of its elk herd within three years; and increased grazing management standards to protect upland areas. The DEIS assessed five alternatives: 1) No Action; 2) Minimal Action; 3) Target Action, which is the proposed action; 4) Conservation Team Recommendations; and 5) Immediate Removal of Ungulates.

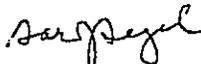
We have rated the DEIS as EC-2, Environmental Concerns - Insufficient Information. We have environmental concerns because potential environmental impacts associated with elements of the proposed project are not discussed in the DEIS (two major examples are impacts associated with the weed management and road management programs). In terms of the weed management program, we believe that the Final Environmental Impact Statement (FEIS) should provide information regarding the use of herbicides should that be part of the proposed project. Similarly, the reader gets the impression that the road management program may

FINAL RESOURCES MANAGEMENT PLAN FOR SANTA ROSA ISLAND
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have potential impacts on water resources and/or wetlands, due to a brief reference to the Army Corps' permit process. Such impacts (and mitigation) should be discussed in the FEIS. We believe that it is very important for the National Park Service to work closely with the Regional Water Quality Control Board to ensure that applicable provisions of the Clean Water Act are carried out in an expeditious manner. We recommend that the National Park Service integrate those elements from Alternative D which are more environmentally protective into the final proposed action. This would serve to ensure consistency with requirements of the Clean Water Act and State water quality protection requirements. We encourage the Park Service to design and implement its management actions with the concept of pollution prevention in mind. Please refer to the attached "Summary of Rating Definitions and Follow-Up Action" for a more detailed explanation of our EC-2 rating and to the attached comments for an in-depth discussion of our concerns.

We appreciate the opportunity to provide comments. Please send one copy of the FEIS to me (code: E-3) when it is filed with EPA's Washington, D.C. office. If you have any questions, please call me at 4-744-1584 or David Tomsovic of my staff at 415-744-1575.

Sincerely,


for David Farrel, Chief
Federal Activities Office

Enclosures: 3

- (a) EPA rating sheet for DEISS
- (b) EPA comments on DEIS
- (c) Pollution prevention checklist on grazing

cc: Tim Setnicka, Channel Islands National Park
Patricia Port, DOI
Howard Kolb, RWQCB

M.I. #2542

SUMMARY OF RATING DEFINITIONS AND FOLLOW-UP ACTION

Environmental Impact of the Action

LO-Lack of Objections

The EPA review has not identified any potential environmental impacts requiring substantive changes to the proposal. The review may have disclosed opportunities for application of mitigation measures that could be accomplished with no more than minor changes to the proposal.

EC-Environmental Concerns

The EPA review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce the environmental impact. EPA would like to work with the lead agency to reduce these impacts.

EO-Environmental Objections

The EPA review has identified significant environmental impacts that must be avoided in order to provide adequate protection for the environment. Corrective measures may require substantial changes to the preferred alternative or consideration of some other project alternative (including the no action alternative or a new alternative). EPA intends to work with the lead agency to reduce these impacts.

EU-Environmentally Unsatisfactory

The EPA review has identified adverse environmental impacts that are of sufficient magnitude that they are unsatisfactory from the standpoint of environmental quality, public health or welfare. EPA intends to work with the lead agency to reduce these impacts. If the potential unsatisfactory impacts are not corrected at the final EIS stage, this proposal will be recommend for referral to the Council on Environmental Quality (CEQ).

Adequacy of the Impact Statement

Category 1-Adequate

EPA believes the draft EIS adequately sets forth the environmental impact(s) of the preferred alternative and those of the alternatives reasonably available to the project or action. No further analysis or data collection is necessary, but the reviewer may suggest the addition of clarifying language or information.

Category 2-Insufficient Information

The draft EIS does not contain sufficient information for EPA to fully assess environmental impacts that should be avoided in order to fully protect the environment, or the EPA reviewer has identified new reasonably available alternatives that are within the spectrum of alternatives analyzed in the draft EIS, which could reduce the environmental impacts of the action. The identified additional information, data, analyses, or discussion should be included in the final EIS.

Category 3-Inadequate

EPA does not believe that the draft EIS adequately assesses potentially significant environmental impacts of the action, or the EPA reviewer has identified new, reasonably available alternatives that are outside of the spectrum of alternatives analyzed in the draft EIS, which should be analyzed in order to reduce the potentially significant environmental impacts. EPA believes that the identified additional information, data, analyses, or discussions are of such a magnitude that they should have full public review at a draft stage. EPA does not believe that the draft EIS is adequate for the purposes of the NEPA and/or Section 309 review, and thus should be formally revised and made available for public comment in a supplemental or revised draft EIS. On the basis of the potential significant impacts involved, this proposal could be a candidate for referral to the CEQ.

*From: EPA Manual 1640, "Policy and Procedures for the Review of Federal Actions Impacting the Environment."

EPA COMMENTS ON DEIS, IMPROVEMENT OF WATER QUALITY AND CONSERVATION OF RARE SPECIES & THEIR HABITAT, SANTA ROSA ISLAND, CHANNEL ISLANDS NATIONAL PARK

ALTERNATIVES

The DEIS assesses five alternatives, including the No Action alternative which is required under the Council on Environmental Quality's Regulations for Implementing NEPA. The five alternatives are: A, No Action; B, Minimal Action; C, Targeted Action; D, Conservation Team Recommendations; and E, Immediate Removal of Ungulates. Alternative C is the proposed action.

We note that the impact topic in Table 2 for water quality and riparian areas captures the likely environmental impacts for the various action alternatives, as well as No Action. For example, under No Action, "Water quality will remain low, with high coliform levels from cattle fecal inputs." Under Alternative B, "the majority of streams will remain unprotected from grazing..." The situation improves somewhat under Alternatives C and D, although significant water quality problems remain (D being better than C). According to Table 2, under Alternative C, "[m]ost streams in South and Pocket Field Pastures will remain unprotected from the effects of grazing." Even with Alternative D, "[m]ost streams in South Pasture will remain unprotected from the effects of grazing."

We recommend that, for the FEIS, the National Park Service integrate those elements from Alternative D which are more environmentally protective than those found in C. This would serve to ensure consistency with the requirements of the Clean Water Act, State water quality protection requirements (see discussion below on CWA Section 313), and the RWQCB's enforcement documents.

CLEAN WATER ACT, SECTION 313

Although the Draft Environmental Impact Statement (DEIS) indicates that the Channel Islands National Park is subject to a Cleanup or Abatement Order issued by the Regional Water Quality Control Board (RWQCB) on August 18, 1995, the DEIS does not acknowledge that the RWQCB's authority to issue such an enforcement order derives from Section 313 of the Clean Water Act (CWA). We believe that the omission of this from the DEIS may lead the public to question why a State agency (RWQCB) can legally issue an order against a Federal entity (National Park Service). The National Park Service certainly has jurisdiction over Santa Rosa Island, and the DEIS clearly acknowledges that water pollution is a problem on the island. For example, page 2 indicates that "The Park has previously documented high fecal coliform and Ph levels in Santa Rosa streams..."

Under Section 313 of the CWA, Federal agencies are required to comply with applicable State water pollution control requirements to the same extent as a private party. Section 313 specifically provides that Federal agencies having jurisdiction over a property or facility or engaged in any activity resulting, or which may result, in the discharge or runoff of pollutants

"shall be subject to, and comply with, all Federal, State...and local requirements...respecting the control and abatement of water pollution in the same manner, and to the same extent as any nongovernmental entity..."

We recommend that the Final EIS (FEIS) specifically recognize the applicability of Section 313.

APPLICABLE BASIN PLAN

The Water Quality Control Plan ("Basin Plan") developed by the RWQCB and approved by U.S. EPA under the CWA contains specific requirements on toxicity and pesticides. We're concerned that the DEIS does not discuss the need to ensure the project's consistency with the Basin Plan (dated 12/9/94). The DEIS does not specifically reference the need for the National Park Service to comply with applicable pesticide and toxicity requirements in the Basin Plan. For example, the section of the Basin Plan dealing with water quality objectives addresses a number of toxic pollutants (including pesticides). It has specific seven requirements on pesticides use:

1. No individual pesticide or combination of pesticides shall be present in concentrations that adversely affect beneficial uses.
2. Discharges shall not result in pesticide concentrations in bottom sediments or aquatic life that adversely affect beneficial uses.
3. Total identifiable persistent chlorinated hydrocarbon pesticides shall not be present in the water column at concentrations detectable within the accuracy of analytic methods approved by EPA or the RWQCB.
4. Pesticide concentrations shall not exceed those allowed by applicable antidegradation policies.
5. Pesticide concentrations shall not exceed the lowest levels technically and economically achievable.
6. Waters designated for use as a domestic or municipal drinking water supply shall not contain pesticide concentrations in excess of the Maximum Contaminant Levels set forth in the California Code of Regulations, Title 22.

7. Waters designated for use as domestic or municipal domestic drinking water supply shall not contain concentrations of thiobencarb in excess of 1.0 ug/l.

We recommend that the FEIS discuss whether the above requirements in the Basin Plan have any implication for the EIS/RMP. In particular, the FEIS should indicate instances where Park Service activities under this EIS/RMP would or may be inconsistent with any Basin Plan requirement(s). If such is the case, the FEIS and Record of Decision (ROD) should discuss how the Park Service intends to adhere to the Basin Plan's requirements.

STORMWATER PERMIT

The FEIS should discuss the applicability of the CWA's stormwater permit provisions for the proposed project because, depending on the acreage of land disturbance, compliance with the stormwater permitting requirements may prove applicable. Under the CWA, projects which disturb soils require a stormwater discharge permit. Permits are required for all stormwater discharges associated with construction where clearing, grading and excavation results in land disturbance of five (5) or more acres. Stormwater discharges from construction activity disturbing less than five acres, but which are part of a larger common plan or development, also need a permit. Among other requirements, landowners where construction occurs are required to develop and implement a stormwater pollution prevention plan. Under CWA Section 313, this requirement applies to Federal facilities and Federal property. We expect that the BMPs identified in the DEIS would become a component of the stormwater pollution prevention plan, should one prove necessary.

COORDINATION WITH THE RWQCB

We've received a copy of the June 17, 1996 letter issued by the RWQCB on the DEIS and their June 17 letter on Cleanup or Abatement Order 95-064. Viewed together, the two letters are a good overview of how the RWQCB views the water pollution problems on Santa Rosa Island and actions that the RWQCB believes are needed to ensure compliance with applicable water quality protection requirements. We encourage the Park Service to move in an expeditious manner so as to ensure compliance with applicable water quality standards, the Basin Plan, and other water quality requirements.

WEED MANAGEMENT PROGRAM

The DEIS (p. 13) discusses an expanded weed management program for Santa Rosa Island, indicating that "[u]nder all alternatives, the weed management program would be increased as funding allows, in order to address weed management problems..." However, the DEIS does not provide specific information or details on the

expanded weed management program. We recommend that the FEIS provide a brief discussion of the following:

1. the chemicals that may be used in the weed management program;
2. the volume of each chemical proposed for use;
3. the environmental impacts associated with the various chemicals including impacts to surface waters and non-target species;
4. alternatives to the use of such chemicals, particularly if adverse impacts to non-target species are projected; and
5. consistency with applicable provisions of the Basin Plan for non-aerial and aerial applications.

The FEIS should acknowledge that Federal agencies and Federal facilities need to adhere to both the Federal pesticide law (FIFRA) and State pesticide requirements (see Executive Order 12088). The use of pesticides and herbicides for a variety of management activities (weed control, landscaping, pest/vector control, mosquito abatement, etc.) are subject to FIFRA and State requirements.

OZONE-DEPLETING CHEMICALS

The FEIS should specifically discuss whether any class I or class II substances, or products made with or containing such substances, are proposed for use in the weed management program. Under EPA regulations, class I and class II controlled substances are regulated under the Clean Air Act (CAA) as ozone-depleting substances. 40 CFR 82.80 requires that Federal agencies adopt regulations that conform to the policies and requirements of CAA Title VI. 40 CFR 82.84 stipulates that the procurement regulations of each Federal agency provide that, "...in place of class I or class II substances, or of products made with or containing such substances, safe alternatives identified under 42 U.S.C. 7671K...shall be substituted to the maximum extent practicable." (underline added). Due to the absence of discussion in the DEIS on specific elements of the weed management program, it is unclear whether the Park Service has in fact substituted safe alternatives to the "maximum extent practicable," rather than using class I or class II controlled substances.

The FEIS should discuss whether the Park Service has considered the use of safe alternatives to the maximum extent practicable, as opposed to using class I or class II controlled substances. The FEIS and ROD should include appropriate commitments in this regard.

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POLLUTION PREVENTION: The DEIS does not specifically recognize the Council on Environmental Quality (CEQ) memorandum (1/29/93 Federal Register) on incorporating pollution prevention features in Federal agency NEPA documents. CEQ encouraged Federal agencies to integrate pollution prevention features in their NEPA planning and decision-making. The FEIS and ROD should reflect a commitment to implement pollution prevention measures in management actions for the island (i.e., management of ungulate populations and other activities such as weed and road management). Please find the attached pollution prevention checklist on grazing for your reference.

ROAD MANAGEMENT

The DEIS (p. 13) refers to Best Management Practices associated with road management, noting that the Park Service "is currently applying to U.S. Army Corps of Engineers for a permit to cover such practices." We would appreciate more information in the FEIS as to the type of permit that would be issued by the Army Corps. We recommend that the FEIS identify whether proposed or pending road management actions require placing fill material in waters of the United States (including wetlands and other special aquatic sites). If CWA Section 404 proves applicable, the FEIS should discuss the project's consistency with the 404(b)(1) Guidelines at 40 CFR Part 230, including avoidance and minimization of potential impacts and mitigation for unavoidable adverse impacts to waters of the United States. A key component of the 404(b)(1) Guidelines is to avoid the placement of fill material in waters of the United States. The 404 permit applicant (Park Service) must obtain CWA Section 401 certification from the RWQCB that ensures the protection of water quality standards for the 404-regulated activities. Section 401 water quality certification is needed before the Army Corps issues a permit.

DEER & ELK REMOVAL

Page 16 indicates that deer and elk "are property of the permittee" and that the permittee has five years to remove all deer from the island. The DEIS indicates that choice of removal method will be left to the permittee's discretion, but that the Park Service will oversee the removal effort. We recommend that the FEIS discuss the removal methods that the permittee may have under consideration. Should non-lethal removal be proposed, we recommend that the discussion indicate where the deer and elk may be relocated to and whether the National Park Service intends to examine the removed animals to ensure that any disease or parasites they may carry are not introduced to the relocation area(s). The introduction of disease or parasites from a relatively closed ecosystem on Santa Rosa Island could have adverse impacts to deer and elk elsewhere.

POLLUTION PREVENTION/ENVIRONMENTAL IMPACT REDUCTION CHECKLIST FOR GRAZING

How Can Grazing Affect the Environment?

Rangelands support native vegetation or introduced species for the grazing of livestock. Livestock use of rangelands for grazing can have significant impacts on the environment. Grazing causes water quality and quantity impacts, destruction or alteration of wildlife habitats, erosion, sedimentation, and soil compaction. Grazing animals may be a component of rangeland ecosystems, and appropriate grazing management can meet environmental objectives. Pollution prevention techniques as an integral part of grazing management can prevent or minimize environmental impacts.

Also see checklist on Ecosystem Preservation and Protection.

What Questions Should Be Asked To Ensure That These Effects Are Minimized or Eliminated?

Protection of Sensitive Areas. Sensitive areas, including streambeds, wetlands, estuaries, ponds, lakeshores, and any other riparian zones, are of particular concern. Areas where endangered species are found are also of special concern. Minimizing erosion from rangelands above the riparian zone is important in its potential for impact on those sensitive areas.

- Have sensitive habitats and impaired waterbodies been identified, and will these habitats be excluded from livestock grazing areas? *
- Will riparian areas be fenced to create a barrier to livestock? *
- Has consideration been given to the location of the fence and the possibility that a fence might cause livestock to concentrate in small areas? Livestock tend to walk along fences, thereby causing paths to become bare channels that lead to erosion, especially if paths channel to streambeds. *
- Will controlled stream crossings be provided for livestock? *
- Will controlled watering access for drinking be provided for livestock? *
- Will alternative drinking water locations be provided for livestock use? *
- Will salt licks and shade areas be available to keep livestock away from sensitive areas? *

Grazing Management System. Grazing management systems can incorporate pollution prevention and ensure proper grazing use. Proper grazing use will protect against soil erosion, sedimentation, and contamination of riparian resources, as well as maintain or improve the quality of rangeland vegetation.

- Will a grazing management system be implemented? *
- Will deferred grazing, a practice whereby grazing is postponed or grazing land is rested for a prescribed period, be included? *

* Indicates an environmental impact reduction opportunity.

- Will a planned grazing system be put in place in which two or more grazing units are alternately rested and grazed in a planned sequence for a defined period? *
- Have such factors as livestock stocking rates, livestock distribution, timing (season of forage use) and duration of rest and grazing periods, livestock kind and class, and forage use allocation for livestock and wildlife been considered? *
- Will recycled materials be used in the construction of rangeland structures, such as fencing or water delivery systems? *

Provision of Alternative Water Supplies. Alternate water sources will keep livestock away from streambanks and riparian zones and prevent the destruction of habitat and pollution of surface water by manure solids, nutrients, and bacteria.

- Has a type of alternate water supply been identified? Does the water supply reduce the concentration of livestock in any one given area? *
- Will adequate water control and wastewater disposal devices be installed? *
- Will irrigated rangeland be managed to reduce water use? *

Stabilizing Rangeland Vegetation. A number of practices can be employed to prevent the erosion of rangeland and to reduce vegetation destruction and the need for revegetation.

- Will rangeland quality be restored through revegetation if quality deteriorates as a result of poor management? *
- Will adapted plants be established by seeding on native grazing land? Can native grazing land be used without requiring seeding of forage plants? *
- Will range seeding require the use of chemicals (fertilizers, herbicides)? Can the use of chemicals be reduced or eliminated? *
- Will prescribed burning be used to stabilize vegetation? Will all prescribed burn activities be conducted so that ash and exposed soil will not be mobilized during a runoff event? *
- Will prescribed burning be conducted consistent with the Clean Air Act and/or local air quality regulations? *

Other References

U.S. Environmental Protection Agency, Office of Water. January 1993. *Guidance Specifying Management Measures for Sources of Non Point Pollution in Coastal Waters.* EPA No. 840-B-92-002.

* Indicates an environmental impact reduction opportunity.

FINAL RESOURCES MANAGEMENT PLAN FOR SANTA ROSA ISLAND
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United States Department of the Interior
FISH AND WILDLIFE SERVICE

Ecological Services
Ventura Field Office
2493 Portola Road, Suite B
Ventura, California 93003

POSTMARKED 9/10/96

NATIONAL PARK	9/11/96
Interior	FAX REC'D 9/9/96
AS/	Supt.
	Asst. Supt.
	Admin.
	Interp.
	Maint.
	Rangers
	Res. Mgt.
	NBS-Mar
	September 9, 1996

To: Superintendent, Channel Islands National Park, National Park Service, Ventura, California

From: *Diane K. Madsen*
Field Supervisor, Ecological Services - Ventura Field Office, Ventura, California

Subject: Draft Resources Management Plan and Environmental Impact Statement for Improvement of Water Quality and Conservation of Rare Species and Their Habitats on Santa Rosa Island

The U.S. Fish and Wildlife Service (Service) has reviewed the referenced document, which was prepared in response to the proposal of numerous taxa of the northern Channel Islands by the Service for listing as endangered, pursuant to section 4 of the Endangered Species Act of 1973, as amended (Act), and to a Cleanup or Abatement Order, issued by the Central Coast Regional Water Quality Control Board, for the improvement of water quality on Santa Rosa Island. The draft environmental impact statement (DEIS) contains five alternatives, which range from no action to the complete removal from the island of all non-native ungulates within three years. The targeted management action constitutes the National Park Service's (NPS) proposed range management plan. The Service's comments have been prepared under the authorities of, and in accordance with, the provisions of the National Environmental Policy Act (NEPA).

History of Service Involvement with Range Management Practices on Santa Rosa Island

In 1991, Service staff participated, with NPS staff, in the monitoring of sensitive plant taxa on Santa Rosa Island. As a result of that effort and information provided by NPS and other researchers, the Service proposed 16 plant taxa from the northern Channel Islands for listing under the Act on July 25, 1995.

The Service provided comments on the NPS's range management plan on three occasions. To the best of our knowledge, the NPS has not addressed the concerns in the Service's memoranda, dated November 4, 1991, November 4, 1992, and December 16, 1993. These memoranda are available from our files if you require copies.

In 1994 and 1995, the Service and NPS formally consulted on the effects of activities within Channel Islands National Park (CINP) on the listed peregrine falcon (*Falco peregrinus*), brown

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pelican (*Pelecanus occidentalis*), and western snowy plover (*Charadrius alexandrinus nivosus*). The use of the western snowy plover's nesting habitat at Skunk Point on Santa Rosa Island was a major point of discussion during the consultation. The consultation resulted in the Service finding that the NPS's actions were not likely to jeopardize the continued existence of these species. The biological opinion contained a reasonable and prudent measure designed to reduce the effects of the take of western snowy plovers at Skunk Point as a result of cattle.

Finally, the Service and NPS signed a memorandum of understanding to develop a conservation strategy for the northern Channel Islands. Service staff participated in an interdisciplinary team with personnel from the NPS and National Biological Service to develop this strategy. The goal of the strategy was "to conserve and restore to the four northern channel islands those proposed and candidate plant and wildlife species protected under the Endangered Species Act and National Park Service policy, as well as the habitats upon which they depend (Coonan et al. 1996). The conservation strategy developed by the team and presented in Coonan et al. (1996) was described as alternative D of the DEIS.

General Comments

As a resource management plan, the document fails to provide sufficient information to allow the reader to fully understand the actions the NPS proposes to undertake to resolve problems associated with water quality and rare plant and animal species. The proposed resource management plan, alternative C, contains information that only very generally describes the NPS's proposed actions. Without a more complete description of the proposed action, the reader cannot fully understand the range of actions that the NPS is proposing to implement.

The Service also believes that the DEIS does not adequately fulfill the NPS's responsibilities under NEPA to fully inform the public of the goals and objectives of the NPS in managing Santa Rosa Island. Specifically, the DEIS proposes actions to meet the goals of improving water quality in surface streams and promote the conservation of rare species on Santa Rosa Island. However, these goals are not reviewed within the broader context of the NPS's mission at CINP. Without information on the NPS's overall objectives and goals specific to the management of Santa Rosa Island, the reader cannot determine the potential adequacy of the proposed actions. For example, the proposed action may meet the goal of maintaining a ranching operation, if that is the NPS's primary objective for the management of Santa Rosa Island. However, if restoration of natural communities is the primary goal for NPS management of Santa Rosa Island, alternatives D and E may be more appropriate.

The DEIS does not contain sufficient information to allow the reader to fully evaluate the costs of the various management actions that are considered under the various alternatives. The DEIS notes for all alternatives that implementation of a weed control program is dependent upon available funds. The funds needed to conduct a weed control program would seem to pale in comparison to those required for the NPS to implement many of the programs described in the DEIS. Construction alone of the riparian enclosures would seem to be difficult to fund. Given the uncertainties associated with the budgeting process for Federal agencies, the logical course of

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action for a NEPA document would be to fully disclose the cost of implementing the various programs that have been described under all the alternatives and provide a cost/benefit analysis. The DEIS should also describe the potential for CINP to actually acquire the funds that would be needed to implement the various alternatives and describe the prioritization of actions that would occur, if all actions are not funded in any given year.

Specific Comments

Rare Species and Their Habitats, page 3. The final environmental impact statement should note that the moratorium on the listing of species under the Act has been lifted. The statement on the NPS's requirements under the Act with regard to proposed species should be corrected. The NPS is required to confer with the Service on potential actions which are likely to jeopardize the continued existence of proposed species. The NPS's conference requirements are correctly described elsewhere in the DEIS.

Acquisition of Santa Rosa Island, pages 3 and 4. In the second paragraph of this section, the DEIS states that the enabling legislation for CINP allowed the former owner of Santa Rosa Island, the Vail and Vickers Company, to reserve the right of use and occupancy. The DEIS also notes that Vail and Vickers did not reserve that right. Additionally, the DEIS notes that Vail and Vickers did not enter into a lease agreement with the Secretary of the Interior, as permitted by the enabling legislation, "under which the former owner could continue any existing use of such property, provided the use was compatible with the administration of the park and with the preservation of the resources therein."

These statements should be more fully explained because they seem to raise important issues about the overall goals and objectives of the NPS's management of Santa Rosa Island (which, the Service noted previously in this memorandum, are not discussed in the DEIS) and the range management plan and alternative the NPS has selected as its proposed action. Specifically, the type of actions that may be appropriate to improve water quality and conserve rare species would likely be different under the differing goals and objectives of maintaining a profitable ranching operation versus a "living museum" to display the history of Santa Rosa Island while fully promoting the restoration of its natural habitats.

Road Management, page 13. The DEIS notes that the NPS is currently applying to the U.S. Army Corps of Engineers (Corps) for a permit, pursuant to section 404 of the Clean Water Act, to implement best management practices for road maintenance. The DEIS fails to note that the section 404 permit would only apply to areas under the Corps' jurisdiction. If road maintenance outside of the Corps' jurisdiction would cause sedimentation of streams, the NPS's application for a permit would not include these areas. Additionally, road maintenance was identified as a contributing factor to decreased water quality. If the NPS proposes to continue (our emphasis) to implement best management practices, the DEIS should discuss how water quality would be improved by continuing an activity that was identified as a factor that contributes to the problem.

Closure of Old Ranch Pasture, page 15. The DEIS states that the horse herd in Old Ranch

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Pasture would remain after cattle are removed. However, the number of horses that would remain is not discussed. The effects of horses on the habitat and rare species within the pasture would be dependent upon the number of animals that would remain.

Split North Pasture..., page 22. The NPS proposes to allow 826 cattle to graze in Black Mountain Pasture during the summer; this number is based on the "current grazing capacity." However, the manner in which the current grazing capacity was defined was not described. The NPS should define this term and explain how it was determined.

Changes in Grazing Management, page 22. The DEIS does not provide information on the fate of cattle that are removed from a pasture when the residual dry matter (RDM) falls below 1000 pounds per acre. The DEIS should provide information on whether the cattle would be moved off the island or rotated to another pasture.

Phased Removal of Grazing, page 26. The "scorecard" method is not defined in this section.

Water Quality and Riparian Areas, page 31. The DEIS notes that Lobo Canyon supports tree and shrub species not found elsewhere on Santa Rosa Island, but does not provide a reason for this difference in vegetation. If the DEIS presented this information, the reader may be better able to judge the appropriateness of the NPS's proposed conservation measures.

Grazing/Hunting Permittee, page 46. The DEIS seems to state that perennial grass sites "require less intensive utilization" than areas supporting annual grasses. The NPS should provide rationale for this statement.

Soils, page 49. The analysis briefly concludes that stabilization and recovery of soils "should subsequently occur" when grazing ends in 2011. This cursory analysis seems to ignore the available scientific evidence that the stabilization and recovery of soils may take many years. The DEIS should clarify how this conclusion was reached and provide literature citations to support its conclusions.

Wildlife, page 50. As in our previous comment, the reaction of the island's wildlife to removal of grazing is not likely to be immediate. The NPS should provide a full analysis, with literature citations, for its conclusions regarding time frames for recovery of wildlife populations.

Cumulative Effects, page 57. The statement in the DEIS regarding a proposed rule to delist the peregrine falcon is technically incorrect. The Service published a notice of intent to prepare a proposed rule; a proposed rule has not yet been published.

Water Quality and Riparian Areas, page 58. The DEIS does not provide any information on the predicted time frames for the recovery of water quality and riparian areas from the effects of ranching. The NPS should provide information on projected time frames for the review of the public.

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The DEIS notes later on the same page that the beneficial effects of riparian exclosures would "quickly dissipate downstream due to the condition of the riparian areas within unprotected areas, as well as the continued unregulated access (and therefore inputs) of cattle." The Service concurs with this assessment of the overall effects of the riparian exclosures proposed under Alternative B (and under Alternative C, the proposed action). Given the effort that the NPS would need to expend to erect, maintain, and monitor the exclosure, the Service believes the DEIS should contain a much more complete discussion of its benefits. Given the emphasis that Department of the Interior agencies place on the management of ecosystems, the DEIS should present that overall effects of the exclosures on the watershed, rather than emphasize, as this section does, the effects within the exclosure.

Cumulative Effects, page 69. The DEIS states that the removal of cattle from Old Ranch Pasture may not benefit western snowy plovers because nest loss would continue to occur from high winds and predation. The Service's biological opinion to the NPS discussed the effects of cattle and the potential loss of nests from predation and high winds as indirect effects of the presence of cattle. The DEIS should include this information from the Service's biological opinion.

Grazing/Hunting Permittee, page 79. Under this discussion of the effects of the proposed action, the DEIS states that the "intent of the rotational grazing system is to fit into the existing calendar of events of the ranch...." However, on page 19, the DEIS notes that the rotation would be on a seasonal basis, keyed to the climatic seasons. This apparent discrepancy should be resolved and the DEIS should clearly define and analyze the proposed action. If the proposed rotation would be based on the existing calendar of ranch events, the DEIS should fully discuss how these events would influence the biological recovery goals of the range management plan.

Irreversible and Irretrievable Commitments of Resources, page 108. The Service disagrees with the assessment reached by the NPS for the No Action alternative. The loss of soils due to erosion and the potential extinction of taxa should be considered as irreversible and irretrievable commitments of resources that may occur as a result of a decision by the NPS to allow the ranching operation to continue in its present form. We also recommend that the NPS re-evaluate its conclusions with regard to the irreversible and irretrievable commitments of resources that may occur as a result of the action alternatives.

The service appreciates the opportunity to provide comments on the DEIS. If you have any questions, please contact Ray Bransfield of my staff at (805) 644-1766.

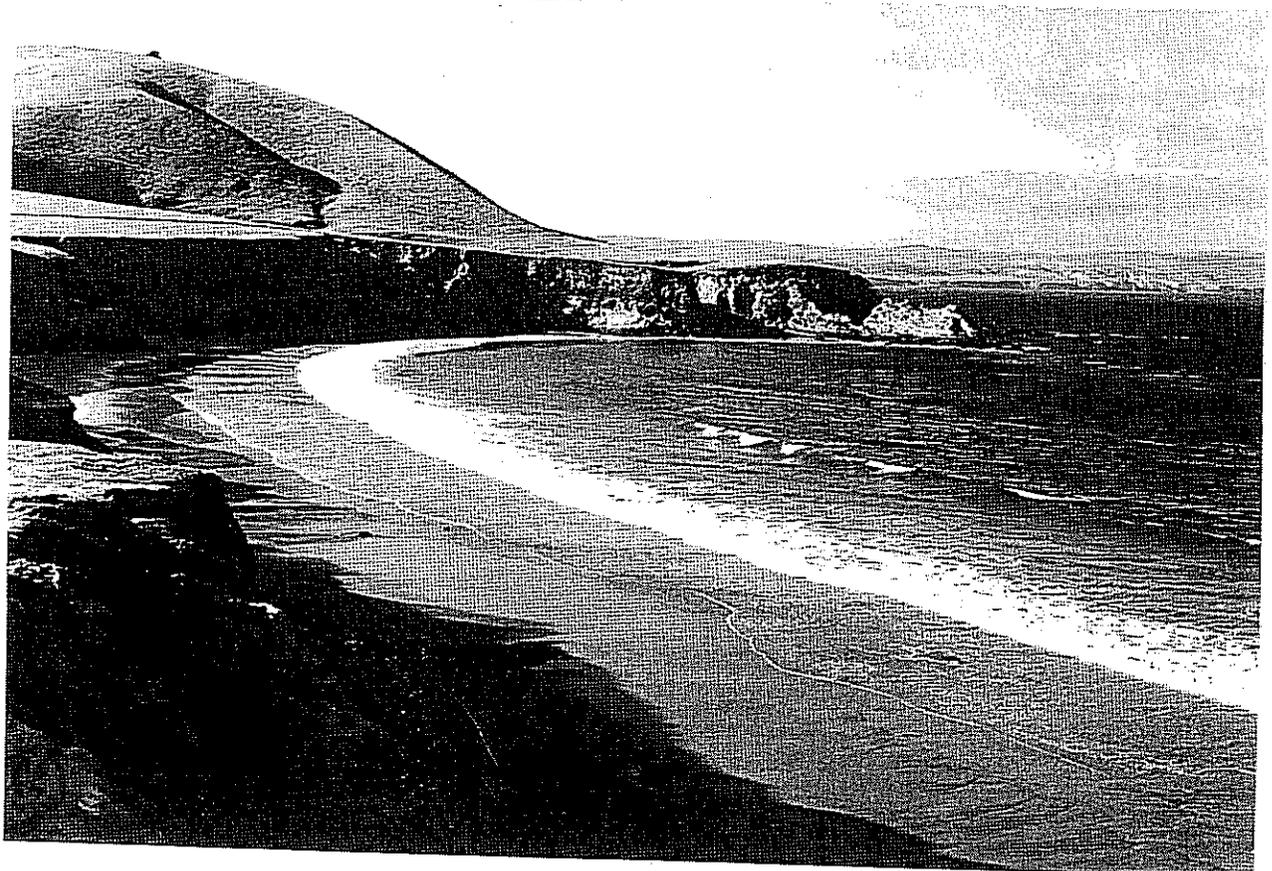
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APPENDIX D HISTORIC LANDSCAPE PHOTOS OF SANTA ROSA ISLAND



Woodward Photo (1939 or 1941)
Southeast Anchorage
Santa Rosa Island



National Park Service Photo (Jan. 10, 1997)
Southeast Anchorage
Santa Rosa Island



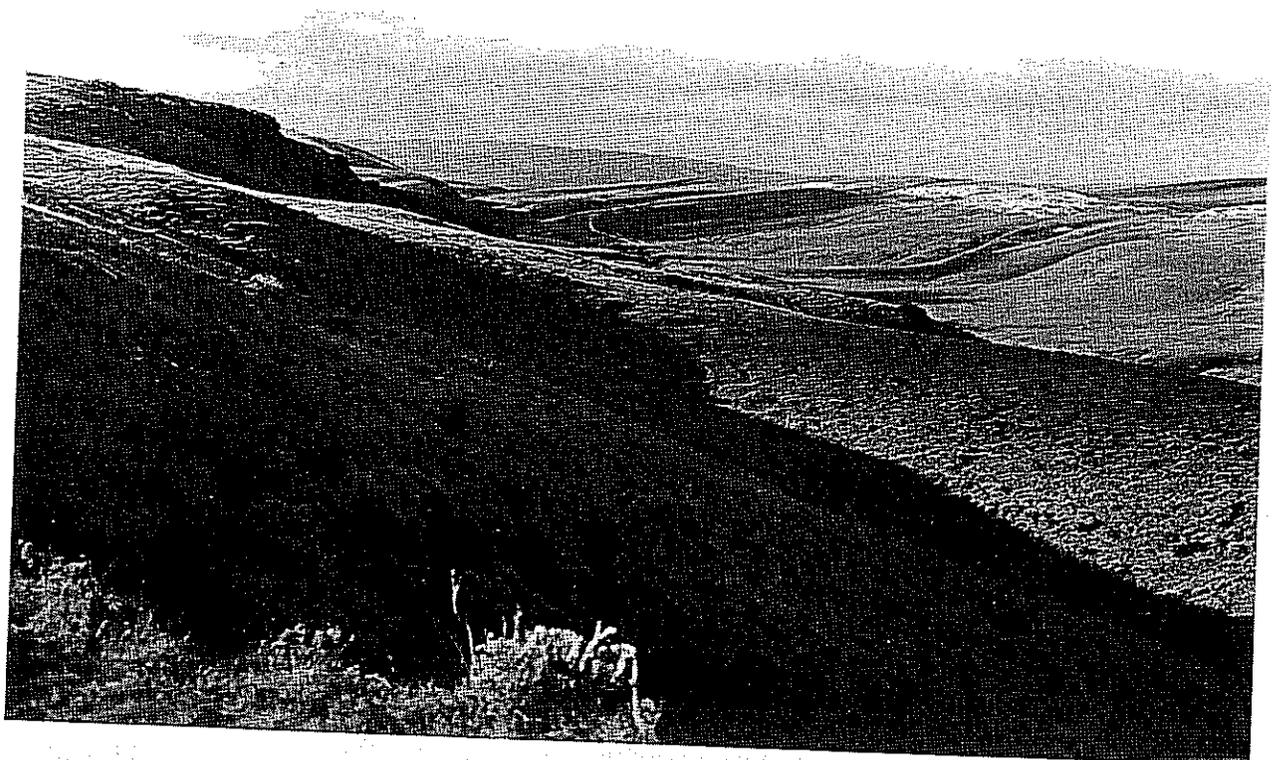
Woodward Photo (1939 or 1941)
Looking Toward Broakway Point from
West of Carrington Point
Santa Rosa Island



National Park Service Photo (Dec. 1996)
Looking Toward Brockway Point from
West of Carrington Point
Santa Rosa Island



Woodward Photo (1939 or 1941)
Old Ranch Canyon Looking Westerly to
Bechers Bay
Santa Rosa Island



National Park Service Photo (Jan. 10, 1997)
Old Ranch Canyon Looking Westerly to
Bechers Bay
Santa Rosa Island



David Banks Rogers Photo (March 1927)
Torrey Pines
Santa Rosa Island



National Park Service Photo (Jan. 11, 1997)
Torrey Pines
Santa Rosa Island

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