



United States Department of the Interior



NATIONAL PARK SERVICE
Pacific West Region
333 Bush Street, Suite 500
San Francisco, California 94104-2828

IN REPLY REFER TO:
L7617 (PWRO-P)

12 MAY 2015

Memorandum


To: Superintendent, Point Reyes National Seashore

From: Acting Regional Director, Pacific West Region

Subject: Environmental Compliance for Coastal Dune Ecosystem Restoration
Using Multiple Techniques

The *Finding of No Significant Impact* for eradication of non-native plants on up to 600 acres through application of various integrated strategies is approved. To complete this particular compliance effort, at the time when the park issues notice of the decision, the *Errata* prepared as a technical supplement to the original Environmental Assessment (EA) must be distributed to permitting agencies and all other parties that received or commented on the EA.

The Seashore's continuing efforts to restore natural conditions and promote visitor understanding of coastal dune functions demonstrate a concerted commitment to an applied research-resource stewardship program. Congratulations to you and your staff for these initiatives.

for 
Patricia L. Neubacher

cc:
PWR-NR

U. S. Department of the Interior
National Park Service
Point Reyes National Seashore

Finding of No Significant Impact (FONSI)
Coastal Dune Restoration EA

Introduction

Point Reyes National Seashore (Seashore) is proposing to restore up to 600 acres of coastal dune habitat primarily to benefit species listed as threatened or endangered under the Endangered Species Act (e.g., federally listed species). Habitat would be restored by removing highly invasive, non-native plant species that have greatly altered sand movement, dune structure, and habitat function for native plants and animals uniquely adapted to this coastal environment. An Environmental Assessment was prepared for this project in compliance with National Environmental Policy Act (NEPA) and released to the public for review under National Park Service (NPS) Management policies. The EA provides a complete description of alternatives, avoidance and mitigation measures, and analysis of impacts and is the basis upon which this Finding of No Significant Impact (FONSI) is based. The EA reflects the Seashore's own experience restoring adjacent dune habitat, the direct input of adjacent ranchers to minimize impacts on dairy and grazing operations, and the strict requirements for restoration activities dictated by law and NPS policy.

Purpose and Need for Federal Action

The Seashore preserves some of the last remaining high quality coastal dune habitat in the United States. However, this habitat is seriously threatened by the rapid encroachment of two invasive, nonnative plant species, European beachgrass (*Ammophila arenaria*) and iceplant (*Carpobrotus* spp.). By 2009, more than 60% (1,400 acres) of the park's roughly 2,200 acres of coastal dune, bluff, and scrub habitat had been invaded by European beachgrass and iceplant, which establish vast monocultures that crowd out native plant species (NPS 2009).

European beachgrass is particularly problematic at the Seashore. It was introduced to California in the late 1800s to help stabilize blowing sand dunes, which it does by spreading vegetatively by rhizomes. Iceplant, a native of South Africa, was introduced to California in the late 1800s also to stabilize dunes. This succulent spreads both vegetatively and by seed and now is found growing along the entire coast of California.

The Seashore's dunes provide habitat for up to 11 federally listed species, however, the primary species using the dunes are the threatened Western snowy plover (*Charadrius alexandrinus nivosus*), the endangered Myrtle's silverspot butterfly (*Speyeria zerene myrtleae*), and the endangered plants, beach layia (*Layia carnosa*) and Tidestrom's lupine (*Lupinus tidestromii*). Other federally listed species that occur in or near dunes or occasionally frequent dune areas include California red-legged frog (*Rana draytonii*; dune swale wetlands; federally threatened; FT), Sonoma alopecurus (*Alopecurus aequalis* var. *sonomensis*; wetlands in or near dunes; federally endangered; FE), California least tern (*Sternula antillarum*; FE), and Willow flycatcher (*Empidonax traillii extimus*; FE). Additionally, the Seashore's dunes contain the largest remaining expanses

of two uncommon native foredune habitat types—American dunegrass (*Elymus mollis* ssp. *mollis*) and beach pea (*Lathyrus littoralis*).

These rare species and habitat types are imminently threatened by both physical and ecological changes associated with the presence and spread of European beachgrass and iceplant. Invasive plants have both direct and indirect effects on native flora and fauna. The large monotypic stands or mats of European beachgrass and iceplant directly displace native dune vegetation communities, decreasing cover and species richness and diversity of native species and simultaneously increasing overall vegetation cover relative to native dune communities (Barbour et al. 1976, Boyd 1992, Olsen 1994, Vilà et al. 2006, Carboni et al. 2010). Many of these native dune species act as nectar sources for the federally endangered Myrtle’s silverspot butterfly. The invasive species can also expand into beach areas, eliminating potential nesting areas for Western snowy plover.

In addition to direct effects, these species have indirect effects by creating dense stands that provide cover to animal predators of Western snowy plover and seeds of Tidestrom’s lupine. European beachgrass stands harbor a higher density of native deer mice (*Peromyscus maniculatus*) than native dune communities (Boyd 1988), and, at the Seashore, these mice can consume up to 82% of the seeds of endangered Tidestrom’s lupine (Dangremond et al. 2010). In fact, recently completed population viability analyses by university researchers have shown that almost all of the Seashore’s Tidestrom’s lupine populations are headed towards extinction, because they are not successfully reproducing due to seed predation (Dangremond et al. 2010, Pardini and Knight 2013). Plover numbers within the Seashore during the last decade have also dropped dramatically: a number of factors may be responsible, including regional trends, habitat disturbance by people and dogs, and direct and indirect impacts of invasive plants.

Recognition of these impacts led the U.S. Fish and Wildlife Service (USFWS) in its 1998 Recovery Plan for Seven Coastal Species to call for restoration of dune habitats through an “aggressive program to control non-native invasive plant species” (USFWS 1998).

In Management Policies, NPS units are required to “survey for, protect, and strive to recover all species native to national park system units that are listed under the Endangered Species Act. The (Park) Service will fully meet its obligations ...to both proactively conserve listed species and prevent detrimental effects on these species. To meet these obligations, the (Park) Service willundertake active management programs to inventory, monitor, restore, and maintain listed species’ habitats; control detrimental nonnative species...” (NPS 2006, Section 4.4.2.3).

Both European beachgrass and iceplant form dense, monotypic mats or stands. These dense stands alter sand dune structure and function by slowing sand movement and changing sand deposition patterns. In natural communities, dunes continually change in response to sands transported into these systems by waves and wind, typically forming morphologically and floristically distinct foredune and backdune communities. Non-native species and their deep root and rhizome systems armor dune systems and prevent natural migration, which leads to overly large and steeply sloped foredunes and backdunes (Cooper 1936, 1967, Pickart and Sawyer 1998). In Management Policies (2006), NPS units are required to “reestablish natural functions and processes in parks unless otherwise directed by Congress....” (NPS 2006, Section 4.1.5).

Coastal environments are considered among the most vulnerable to changes from climate change, including direct changes (e.g. changes of temperature and precipitation) and indirect

changes, e.g. sea level rise, wind and water circulation, increasing frequency of storm events (U.S. Environmental Protection Agency (USEPA) 2013). With rising sea levels, there will be more frequent and more serious flooding of low-lying coastal areas by extreme tides, storm surges, and wave effects (USEPA 2013). Coastal dunes offer a buffer against storm extreme tides and storm surges (Pries et al. 2008). This buffering capacity, however, is minimized and potentially eliminated when dunes are over-stabilized by invasive plant species or other alterations. Over-stabilization makes dunes more susceptible to loss from erosion by not enabling them to move or migrate naturally in response to sea level rise and changes in erosional patterns (Millington et al. 2009).

The purpose of this action is to improve and restore native coastal dune ecosystems in up to 600 acres of the Seashore through removal of non-native or invasive plant species and to, thereby, benefit native coastal dune ecosystems, natural dune processes, and federally and non-federally listed species that live in or use these ecosystems. Restoration efforts would be focused within three coastal dune system areas at the Seashore. These three general areas – AT&T/North Beach, A and B Ranch/Davis, and Limantour -- are considered a high priority for restoration, because of the value of these areas to threatened and endangered species and the opportunity to expand unfragmented coastal dune habitat. Restoration at AT&T and North Beach would specifically build upon earlier restoration efforts that restored dune habitat south of Abbotts Lagoon (Abbotts Lagoon Coastal Dune Restoration Project), creating several miles of coastline unfragmented by invasive plant species.

Background and Range of Alternatives Considered

The alternatives incorporated for analysis in the EA are strongly related to those that were analyzed as part of the Abbotts Lagoon Coastal Dune Restoration Project EA (NPS 2009). However, there have been some changes. First, this EA is a compliance effort for several high-priority dune restoration areas within the Seashore and not one area, as was the 2009 EA. These areas – AT&T/North Beach, B Ranch/A Ranch/Davis Property, and Limantour – have been prioritized for dune restoration, because they support park objectives of increasing the extent of unfragmented restored coastal dune habitat and preventing listed plant and animal species from becoming locally extinct. These species include Tidestrom's lupine (FE), beach layia (FE), western snowy plover (FT), and/or Myrtle's silverspot butterfly (FE).

Secondly, the Seashore has learned more from its own and others' past restoration experiences: Alternatives have been altered to reflect this increase in the knowledge base. Third, the earlier Abbotts Lagoon project area did not support extensive stands of iceplant, so only one alternative action was contemplated for treatment of iceplant – manual removal. Other areas within the park have much more extensive stands of iceplant that may necessitate other techniques. Lastly, other invasive or potentially habitat-altering plant issues other than European beachgrass or iceplant also need to be addressed.

The primary objectives related to dune restoration at Point Reyes National Seashore include:

- *Remove non-native, invasive plant species from dune habitat where they interfere with natural physical processes such as sand movement and hydrology.*
- *Remove non-native, invasive plant species from dunes to create conditions under which native species can flourish.*
- *Minimize potential for non-native species reinvasion of restored habitat.*
- *Increase potential coastal dune habitat for target threatened and endangered species affected by non-native, invasive plant species.*

Secondary objectives are goals that the park would like to achieve in taking action, but that do not define whether an alternative is reasonable. In other words, fulfilling these goals is desirable but not required.

- *Increase visitor understanding of natural dune processes.*
- *Use adaptive management to inform and improve subsequent dune restoration efforts.*
- *Increase opportunities for research into understanding the restoration of coastal California dunes.*

Four alternatives are evaluated in this EA: an alternative that would not involve near-term restoration at these high-priority areas (No Action or Alternative A) and three action alternatives. In addition to descriptions of treatment activities, staging, and access, each alternative includes an extensive number of environmental protection and management measures. Under Alternative A, no near-term restoration efforts would occur within AT&T/North Beach, B Ranch/A Ranch/Davis Property, and Limantour, but restoration could occur in the future under separate compliance. Also, already permitted projects within these dune system areas would proceed.

The three action alternatives differ in terms of which methods would be used primarily for initial treatment: Alternative B (Manual Removal), Alternative C (Chemical Control), and Alternative D (Mechanical Removal). However, Alternatives C and D would actually rely on a combination of techniques, such as manual removal of beachgrass in wetlands and mechanical removal of beachgrass in wetland and organic pasture buffers in Alternative C, or hand removal of iceplant in Alternatives C and D. In addition, re-treatment may not be the same as the initial control methods. For example, hand removal or spot spraying of re-sprouts may take place after mechanical removal (Alternative D), and hand removal may also occur after initial chemical control (Alternatives C and D).

Under Alternatives C and D, spraying of herbicide would be conducted with a backpack sprayer and calibrated, directed nozzle to control spray in dry conditions with a windspeed of less than 10 mph at plant level. The aquatic-label herbicides proposed for use are glyphosate (AquaMaster®; currently marketed as Roundup Custom®) and imazapyr (Habitat®). These would be used in combination at concentrations of 2% and 1%, respectively, which either meets or is lower than label recommendations for “a robust, perennial grass at the heavily-established” infestation qualifier-level. When not removed manually, iceplant would be treated with glyphosate (AquaMaster®; currently marketed as Roundup Custom®) at a concentration of 1.5%, which meets label recommendations for this species. Mechanical removal would be implemented using large-scale excavators and bulldozers.

Alternative C may also involve some pre-treatment measures to reduce thatch and stimulate re-growth such as prescribed burning or mowing. These treatments reduce thatch and encouraging re-growth of new shoots, thereby increasing efficacy of herbicide application and reducing the volume of herbicide needing to be applied. Mowing may also be conducted after herbicide treatment to reduce the volume of dead European beachgrass biomass and speed decomposition or, under Alternative D, for constructability reasons such as to decrease potential for use of beachgrass by wildlife while construction is being implemented.

Coastal dune restoration adjacent to actively managed or grazed pastures within the Seashore would be designed to minimize movement of sand from the dunes onto adjacent pastures through activities. When adjacent ranchlands border proposed dune restoration areas such as AT&T, North Beach, B Ranch, and A Ranch, restoration plans would emphasize minimizing movement of sands following restoration into adjacent pastures. Methods for achieving this plan would include one or more of the following: 1) focusing on oceanward portions of the dune

system initially; 2) active revegetation of backdune areas; 3) tapering backslopes if mechanical removal is used; 4) phasing restoration in the backdunes to allow time for native vegetation to recruit into the backdunes and assist with soil stabilization; 5) use of some type of sand stabilization technique such as straw bunches (straw planting), mechanical straw crimping, or other proven technique; and/or 6) other avoidance and minimization measures. Restoration efforts would be coordinated closely with adjacent ranchers or other property owners.

Acreage of wilderness varies within project areas from 0 at AT&T and Davis Property to 190 acres at Limantour. Under the alternatives, the minimum tool necessary to accomplish restoration objectives varies, with Alternative B incorporating use of UTVs to haul and dispose of invasive plant biomass. Alternatives C and D incorporate different intensities of heavy equipment use, with use of excavators and bulldozers much more intense under Alternative D, which uses mechanical excavation to remove invasives. Under Alternative C, mowing and prescribed burning proposed as potential pre-treatment measures may not be conducted within wilderness, as they are not actions that are essential for successful implementation of dune restoration.

Preferred Alternative

Alternative C is the preferred alternative. The preferred alternative was identified by assessing and comparing potential benefits and impacts associated with four alternatives, with the preferred alternative being the one that offers the most benefits with the least impact to resources. Alternative C appears to have fewer implementation-related impacts to natural and adjacent land use resources than Alternative D and more long-term benefits to natural dune processes and native ecosystems and species than Alternative B. While mechanical removal project conducted in 2011 increased habitat for federally endangered Tidestrom's lupine and potentially Western snowy plover, in general, these mechanical removal areas have been poorly colonized by vegetation, which has had impacts on adjacent dune, wetland, and grassland resources due to remobilization of decades of accumulated dune sands following European beachgrass removal. The manual removal technique outlined in Alternative B has not been historically successful for treatment of European beachgrass within the Seashore due to the rhizomatous nature of this invasive species, the depths to which its rhizomes extend, its propensity for re-establishing through rhizome or vegetative fragments, and the constant re-treatment necessary to maintain restored areas.

Potential impacts associated with chemical control under Alternative C are minimized through a number of avoidance and mitigation measures. Buffers would be established around rare plants (unless drift shield employed), breeding and certain non-breeding wildlife, and wetlands, as well as between the project area and adjacent organic pastures. The park would continue to implement strict climatic restrictions on spray activities. There would be no spraying during rainfall events or moderate or heavy fog, 24 hours preceding a predicted rainfall event with at least a 20% probability of occurring, or up to 24 hours post rainfall or until plants are dry. Herbicides would also not be applied when the average wind speed exceeds 10 mph at the level of the targeted plants or when maximum wind speed gusts frequently exceed 10 mph.

With costs of both mechanical and manual removal of European beachgrass being 10 times higher than chemical control, the total area of coastal dune that could be restored at AT&T (or any other of the proposed restoration areas) under Alternatives B and D would probably be much lower than under Alternative C.

Environmentally Preferable Alternative

Alternative C is also the alternative deemed by the Seashore to be environmentally preferable. The environmentally preferable alternative is defined by the Council on Environmental Quality (CEQ) as the one which “causes the least damage to the biological and physical environment; it also means the alternative which best protects, preserves and enhances historic, cultural and natural resources.”

In this instance, the environmentally preferable alternative was determined using the CEQ criteria by weighing the net benefits of the alternatives against impacts to natural, cultural, and other resources during and after implementation. In general, the intensity of benefit comes down to the extent of dunes at AT&T/North Beach, B Ranch/A Ranch/Davis, and Limantour that could be restored and the degree to which listed species at these project areas would benefit from each alternative. Due to a combination of costs and logistical factors, a higher percentage of dunes at AT&T and the other project areas would potentially be restored under Alternative C, with the next highest percentage being under Alternative D, followed by Alternative B. Similarly, Alternative C would probably have the greatest benefits for listed species, followed perhaps by Alternative D, which could greatly benefit disturbance-adapted species such as Tidestrom’s lupine, and then Alternative B.

In terms of impacts, Alternative B would probably have the least impacts during or shortly after implementation, followed by Alternative C, and then Alternative D. Alternative C (and, to a lesser degree, Alternative D) would pose risks to resources through use of herbicide and potentially mowing or prescribed burning used as pre- and post-treatment measures. While data are far from conclusive, herbicides proposed for use by the park would appear to have the potential for no more than negligible to at most minor impacts on a short-term basis to the Seashore’s dune physical and biological resources, particularly as re-treatment needs may be greatly reduced relative to manual removal. Mechanical removal would have impacts during implementation from the disturbance caused by heavy equipment, contractor crews, and UTVs, but could also have longer term indirect impacts on adjacent native dunes, wetlands, and grasslands due to remobilization of sands accumulated over decades due to stabilization by European beachgrass and iceplant.

In summary, then, Alternative B would have the least impacts during and shortly after implementation, but would also deliver the least benefit on either a project-area or park-wide scale. This alternative would restore fewer acres, offer fewer benefits for listed species and natural processes, require more frequent re-treatment, and have the highest potential for failure of the four alternatives. Alternative C may result in slightly more impact than Alternative B during and shortly after implementation, but, over the long-term, it would restore more acres and offer more benefits for listed species and natural processes. Alternative D, on the other hand, would have more impact than Alternative C during and after implementation and would deliver fewer benefits to the Seashore’s dunes on a park-wide scale, although there may be considerable benefits on a project-area scale. Based on this analysis, Alternative C would be the approach that best “protects, preserves, and enhances historic, cultural and natural resources.”

Description of Selected Action

Alternative C is the alternative the NPS is selecting for implementation. In selecting the action to be implemented, comments by the public and other organizations and agencies were considered. Most of the substantive comments received concerned the range of reasonable alternatives or alternative components, the adequacy of information presented on specific

aspects of these alternatives (e.g., monitoring, buffers, wetland mitigation plans), and the accuracy and adequacy of information pertaining to impacts on plants, wildlife, and human health from use of herbicides, primarily glyphosate. None of the public comment letters required any modification to the alternatives, including the Preferred Alternative, so the Selected Alternative is the same as the Preferred Alternative in the EA.

As described above for Alternative C, the Selected action consists of initial treatment of European beachgrass and denser patches of iceplant using chemical control, with manual or mechanical removal used in buffers to wetlands or organic pasture and manual removal being used in wetlands or for sparser patches of iceplant. The Seashore would have to obtain a Pesticide Use Permit annually for any herbicides used. Pesticide Use Permits (PUPs) are administered by the Park Service's Integrated Pest Management Program. IPM is a decision-making process that coordinates knowledge of pest biology, the environment, and available technology to prevent unacceptable levels of pest damage, by cost-effective means, while posing the least possible risk to people, resources, and the environment.

To avoid or minimize impacts, the Seashore has proposed to implement extensive environmental protection or mitigation measures. Some of these are standard Resource Protection Measures that are implemented in all applicable Seashore projects: they typically include measures to protect plant and animal life, including federally listed and other rare species; minimize erosion and sediment mobilization; protect wetlands and waters; protect adjacent land uses and cultural resources; prevent and respond to chemical spills; protect adjacent land use, cultural resources, and wilderness; protect public health and safety; and minimize disruptions to the visitor experience and soundscapes within the park. These Resource Protection Measures would be employed by the NPS or contractor staff engaged in implementation. Some of the more important measures proposed for this project are described in Table 1.

Alternatives Considered, but Dismissed

The NPS NEPA regulations (Director's Order 12) indicate that a range of alternatives must be developed with environmental resources as the primary determinant (section 2.7a). In other words, alternatives are to propose different means of accomplishing objectives while at the same time minimizing adverse impacts or maximizing beneficial impacts to some or all resources. Alternatives are also to be environmentally distinct, with issues "sharply defined" to provide a clear basis for choice among options (40 CFR 1502.14).

During the alternatives development process, the project team may evaluate a wide range of options before selecting alternatives or alternative components that will be carried forward for further analysis. Decision-making on whether an alternative or component is reasonable and distinct during the alternative development process should be strongly tied to the ability of alternative or alternative components to meet the project purpose and objectives and available information on existing natural and cultural resources, conflicts with existing land uses, human health and safety needs, and potential for socioeconomic impacts. Through consideration of objectives and planning criteria and use of available information, the project team eliminates alternatives or alternative components or actions (specific tasks or actions within alternatives) that are considered infeasible for technical or economic reasons and that are, therefore, not carried forward for further analysis.

In general, this EA follows the same structure as the 2009 EA for the Abbotts Lagoon Coastal Dune Restoration Project, which evaluated alternatives that varied in the primary approach to

control of European beachgrass, but often incorporated multiple control methods. During the initial scoping period, several alternative approaches for removal of European beachgrass and iceplant were suggested, including application of saltwater, hydromechanical obliteration (HMO), or hot foam treatments. However, application of saltwater is still considered by most restoration practitioners to be experimental and has not had demonstrated success in treating invasives such as European beachgrass and iceplant in dune systems as yet. No examples of use of HMO or hot foam for treatment of European beachgrass could be found, however, limiting factors on application of the former would be volume of non-saline water required for high pressure water jets or hot water-foam to “obliterate” biomass and rhizomes, given rooting depth of at least European beachgrass. In addition, HMO treatment and other water-intensive treatment methods may be logistically constrained by access difficulties for equipment within sandy dunes, as the sheer weight of heavily laden HMO equipment precluded access during the winter for at least one other non-dune invasives removal project (Alvarez et al. 2012).

As part of the part of the public review process, several other alternatives or alternative components were proposed, including grazing, application of vinegar, black plastic sheeting, mulching, and competitive planting with natives. The feasibility of these approaches is discussed specifically in the *Response to Comments* document and incorporated into the appropriate *Errata* sections for the EA. None of the alternative or alternative components proposed during the public EA review period necessitated a change in the structure of the Selected action or the other alternatives considered. Should practicable alternative treatment methodologies be developed in the future, the Seashore and managers at other dune systems may opt to re-evaluate invasive treatment options in future years.

Why the Selected Action will not have a Significant Effect

In the EA, the following impact topics were analyzed for each of the alternatives, including the No Action Alternative (Alternative A): Vegetation, Species of Special Concern, Wildlife, Natural Physical Processes and Soils, Water Resources, Wilderness, Soundscapes, Cultural Resources, Visitor Experience, Adjacent Land Use, Public Health and Safety, and Park Operations and Management. Copies of the EA were provided to the State Clearinghouse, which provides them to regulatory agencies including U.S. Army Corps of Engineers, California Coastal Commission, USFWS, National Marine Fisheries Service, San Francisco Regional Water Quality Control Board (RWQCB), and the State Historic Preservation Office (SHPO). Letters were also independently sent to these agencies announcing the availability of the EA for public review.

The FONSI includes evaluation of criteria to determine whether an impact may be significant. The EA concluded that the Selected alternative would have no effect to moderate effects (both adverse and beneficial) to park resources. None of the potential impacts are considered to be significant. This is supported by the discussion below of the relevant criteria for significance and the measures used by the selected alternative to avoid more than moderate impacts in each.

Criteria (see 40 CFR 1508.27):

1. *The degree to which public health and safety are affected.*

Enjoyment of park resources and values by the people of the United States is part of the fundamental purpose of all parks (NPS 2006, Section 8.2). Some of this enjoyment may ultimately depend on health and safety of park visitors. While recognizing that there are limitations on its capability to totally eliminate all hazards, the Park Service – and its

concessioners, contractors, and cooperators – are directed to provide a safe and healthful environment for visitors and employees (NPS 2006, Section 8.2). Based on Park Service Management Policies (2006, Section 8.2), unacceptable impacts are impacts that, individually or cumulatively, would ... create an unsafe or unhealthy environment for visitors or employees.

Potential impacts to health and safety of visitors could result from manual and mechanical removal and chemical treatment of invasive plant species and from pre- and post-treatment measures such as prescribed burning and mowing. Park staff and contractors are responsible for public safety and must provide adequate area closures, trail monitoring, and signage to ensure that visitors understand safety precautions. The use of herbicides, mechanical equipment, and prescribed burning must conform to Occupational Health and Safety Act regulations (OSHA), USEPA standards, California Department of Pesticide Regulation (CDPR), and local air quality management district regulations. Impact avoidance and minimization measures include closures of work areas during mechanical removal and 24 hours after spraying; noticing of closures; buffers between activities and organic ranching operations; and strict weather restrictions on spraying and prescribed burning. Based on recommendations in the Organic Crop Workbook (NCAT 2004) and consultations with the County, the Seashore will continue to employ a 25-foot buffer between spraying and adjacent ranchlands managed as organic.

Implementation of dune restoration could pose some short-term risks to public safety. Manual removal can create uneven terrain, although it also would reduce the amount of dense vegetation that obscures the ground surface. Heavy equipment can pose a risk to visitor safety, although construction areas would be off-limits to the public and posted as such at all points of access, as well as at the trailhead. Potential implementation-related adverse effects from manual and mechanical removal would range from very negligible to minor. Staging of equipment should have very negligible effects on public safety due to the remoteness of most staging areas such as AT&T, Davis Property, B Ranch, and A Ranch, unless staging occurs in public parking lots, such as at Limantour and North Beach, in which case there may be a minor increase in risk.

During implementation, there is potential for adverse impacts from chemical control due to contact with sprayed vegetation or drift during treatment, however, these risks would be avoided or greatly minimized by closing treatment areas to the public during and 24 hours after treatment and imposing strict weather restrictions on spraying. Risks to the general public from accidental and non-accidental exposures are often expressed in hazard quotients (HQs) in which a HQ of 1 is considered the threshold level of concern. Based on results from application of project-specific information in U.S. Forest Service (USFS) risk assessment models, none of the potential avenues for impacts to public safety from chemical treatment such as spray drift (HQs ~ 0.00001 to 0.01) or inadvertent contact with treated vegetation (HQs ~ 0.0004 to 0.006) would even come closer to approaching the Hazard Quotient threshold level of concern (HQ=1.0) for sensitive individuals such as young women of reproductive age and children wearing shorts and a t-shirt. For imazapyr, the highest HQs are those associated with an accidental spill of imazapyr into a small pond and the subsequent consumption of contaminated water by a small child: For this exposure scenario, the HQs range between 0.2 and 5.0 (SERA 2011b). The park would not apply imazapyr in or within at least 25 feet of aquatic areas, so both of these scenarios are unlikely.

The only non-accidental exposure scenario of concern for glyphosate is for consumption of contaminated vegetation shortly after application (SERA 2011a). This assumes consumption of contaminated European beachgrass or iceplant by people shortly after application, which is

extremely unlikely. Sprayed areas are posted closed for 24 hours after spraying even though labels for both herbicides do not necessarily stipulate closures. For this exposure scenario, the HQ reaches a level of concern (HQ=1) at an application rate of about 1.4 lbs a.e./acre (SERA 2011a). At the maximum labeled application rate of about 8 lbs a.e./acre, the resulting HQ value would be about 5.6 with a corresponding dose of about 10.8 mg/kg bw (SERA 2011a). A HQ of 5.6 would raise concerns for adverse health effects in pregnant women (SERA 2011a). Based on the more recent study by Moxon (1996b *in* SERA 2011a), which notes a LOAEL for fetotoxicity of 300 m/kg bw, a HQ in the range of 5 might raise concern for fetotoxicity (SERA 2011a). For imazapyr, the maximum HQ for consumption of contaminated vegetation by a woman is 0.5 (SERA 2011b).

Based on these risk assessment analyses, threats to public safety from focused spot spraying of glyphosate and imazapyr and associated pre-and post-treatment measure would range from negligible to potentially minor at AT&T/North Beach, B Ranch/A Ranch/Davis Property, and Limantour. Minor impacts to risks to public health and safety may occur due to smoke if a prescribed burning pre-treatment measure is implemented.

Over the long-term, potential impacts to health and safety include remobilization of sand that, in some situations, can blow onto immediately adjacent public roadways, possibly increasing public safety hazards relative to current conditions. These threats could be minimized to some degree by leaving a buffer of iceplant near the road or installing sand fence, which could reduce potential impacts to negligible. Dune restoration can also lessen threats to public health and safety by improving ease and visibility of public access in restored dune areas.

2. *Any unique characteristics of the area; and the degree to which an action may adversely affect an endangered or threatened species or its habitat.*

The proposed restoration program would be expected to have significant beneficial effects on the park's natural resources and ecologically significant areas. Removal of invasive plant species could restore rare native vegetation communities such as dune mat and dune scrub. By doing so, it could not only have significant benefits for native vegetation resources, but for many of the rare and common native plants and wildlife that use these areas as habitat. Some of the projects fall within areas designated as wilderness.

While there may be temporary impacts during implementation, restoration will ultimately benefit wilderness, because planting of European beachgrass and iceplant prior to establishment of the park has impinged on the "untrammled" and "Natural" nature of wilderness, resulting in a coastal dune system that is not "unhindered and free from modern human control or manipulation." Under the Selected alternative, the minimum tool necessary to accomplish restoration objectives would include UTVs and excavators, but the extent and duration of use within wilderness would be minimized to the maximum extent practicable. Mowing and prescribed burning proposed as potential pre-treatment measures may not be conducted within wilderness, as they are not actions that are essential for successful implementation of dune restoration.

Adverse impacts to resources from activities associated with restoration include the potential for temporary loss of habitat, accidental drift or spray during chemical control, crushing of individual plants or slow moving animals, collisions, and disturbance of wildlife from noise and people working on site. Each of these implementation-related impacts is outweighed by long term benefits, but, as noted above, the Selected alternative includes measures to avoid or minimize impacts to existing native plant and wildlife species, including endangered or threatened species

and their habitat, to the maximum extent practicable. Analysis in the EA shows that, to a large degree, these measures either eliminate or substantially reduce the extent or magnitude of impacts.

For example, impacts from the use of heavy equipment or contractor crews conducting spraying have been minimized to the maximum extent practicable by establishing buffers and construction windows during which construction in certain areas cannot occur. Buffers establish a spatial boundary in which mechanical excavation or herbicide spraying cannot occur. Buffers have been established for Western snowy plover nests (500 feet), breeding birds (100 feet), California red-legged frog (60 feet), wetlands (25 feet), and rare plants (10 feet, unless drift shield employed). Pre-construction surveys are required during the plover (March/April to mid-September), breeding bird (March 15 – August 1), and rare plant flowering seasons. For California red-legged frogs, three pre-construction clearance surveys would be required in all wetland areas prior to construction, with the last one no more than 48 hours prior to work start. In addition, buffers for herbicide use have been established for organic crops and livestock (25 feet) to protect adjacent ranchlands. In terms of herbicide use, protection of humans, plants, wildlife, adjacent land use, and sensitive vegetation communities has been strengthened by stringent restrictions on climatic conditions for spraying (e.g., dry conditions with average wind speed less than 10 mph) and approach (backpack sprayer with calibrated nozzle to direct spraying).

In areas that could potentially support Myrtle's silverspot butterfly, contractors would be required to reduce speed to 10 mph to avoid impacts to the butterfly between June 15 and August 31. In addition, access routes would be carefully flagged in order to reroute traffic around areas with western dog violet (*Viola adunca*), the larval host plant for Myrtle's silverspot butterfly

Through these stringent avoidance and mitigation measures, potential implementation-related impacts to resources would be reduced so they do not exceed moderate in intensity: many impacts are negligible or minor, and any potential for moderate long-term impacts have been mitigated to minor in intensity.

Following restoration, the proposed project would have up to moderate long-term benefits for natural resources. The proposed project would result in an increase in diversity and cover of native dune plants and rare plants, including listed species. Restoration would be expected to have moderate long-term benefits for two endangered plant species -- Tidestrom's lupine and beach layia – in project areas where these species currently occur. Eliminating European beachgrass would decrease seed predation of Tidestrom's lupine by deer mice and increase reproductive success and population viability.

Increase of native dune habitat increases foraging sources and plants used for nectaring by Myrtle's silverspot, resulting in minor- to moderate long-term benefits for this species. Removal of European beachgrass would increase unvegetated foreshore for plover nesting and would increase corridors for foraging and brood protection. It would also decrease predation of plovers by ravens, which use European beachgrass for concealment. These actions could have negligible to minor benefits for this species, at least on a localized level. As sand-burrowing arthropods are often lower in abundance and diversity in dense European beachgrass stands (Stenzel et al. 1981, Slobodchikoff and Doyen 1977 in USFWS 2007), restoration should actually increase habitat for animal species of concern such as the globose dune beetle (*Coelus glubosus*) and other common and rare terrestrial invertebrates.

Over the long term, the proposed project may also be impacted by many of the direct and indirect effects of climate change, including sea level rise, increased wave action, and higher winds. However, reestablishing natural dune migration or movement would provide greater resiliency for this system to threats from climate change such as sea level rise and wave- and wind-induced erosion by allowing it to move in response to these pressures. This would ensure that this system remains viable in the future and would continue to provide valuable benefits for plants, animals, and humans through protection from extreme tides and storm surge. Intact dunes also filter groundwater that flows from upland areas to the ocean.

- 3. The degree to which potential impacts are highly uncertain or involve unique or unknown risks.*

None of the impacts resulting from treatment are so uncertain or unknown as to make them potentially significant. A great deal of study has been conducted on the impacts of herbicide on the environment, including soils, plants, wildlife, and humans. These studies have greatly reduced the uncertainty regarding the effects of herbicide, although some unknown risks may still occur. In general, based on the results of these toxicological studies and the context in which herbicide could be used in restoration, including all the impact avoidance and minimization measures that would be implemented, effects do not appear to be potentially significant, with impacts characterized at most as minor.

- 4. The degree to which the action may affect historic properties in, or eligible for listing in the National Register of Historic Places, or other significant, archeological, or cultural resources.*

The proposed project would have no effect on historic properties or properties eligible for listing in the National Register of Historic Places. Over the long term, this alternative would, in general, not directly impact historic districts such as the Shafter/Howard Tenant Ranches Historic District. Grazing pastures at B Ranch/A Ranch/Davis Property are considered contributing features to this historic district, but most dune areas have been marginal areas for grazing throughout the historic-era. Staging and access at B Ranch/A Ranch/Davis Property may have negligible to possibly minor adverse impacts on grazing pastures as contributing features, with the intensity dependent on the amount of site grading and improvement needed for heavy or other equipment. However, these impacts would be short-term at most and would have only negligible adverse effects on the grazing pastures or historic district as a whole.

Indirectly, invasives removal could increase remobilization of sands that could be transported inland into adjacent grazing pastures, with the intensity of impact dependent on restoration method employed. At AT&T/North Beach and B Ranch/A Ranch/Davis Property, indirect adverse impacts on contributing features such as pastures from sand remobilization could range from negligible to possibly minor, with higher intensity impacts resulting from mechanical removal efforts in buffers. Due to cultural resource constraints, there would be no mechanical removal within certain wetland buffer areas at B Ranch/A Ranch/Davis Property. In addition, active revegetation of backdune areas could help to minimize impacts to adjacent pastures from dune restoration.

During invasives removal, there is a potential for impacts to previously recorded or unrecorded archaeological or historic resources within the project areas, particularly at Limantour. Indigenous archeological sites at Limantour are considered contributing sites to Limantour's inclusion in the Drakes Bay Historic and Archeological District, a National Historic Landmark, and the Point Reyes Peninsula Indigenous Archeological District. The potential for impact

would be reduced under this alternative, because mechanical removal -- which involves deeper excavation -- would not be the primary removal method, but would be used only in wetland and organic pasture buffer areas. Avoidance areas may be designated not only to avoid direct impacts, but also indirect impacts to resources from destabilization of sands. Under certain circumstances, the Seashore may try to implement impact mitigation measures to allow for more thorough removal efforts such as use of less invasive removal method, installation of erosion control materials, or active revegetation. Should unrecorded resources be found while mechanical removal is being performed, contractors would be required to follow the impact avoidance and minimization measures for Cultural Resources outlined in the Alternatives chapter, as well as in Table 1.

As noted earlier, mechanical removal would not be conducted within certain wetland buffer areas at B Ranch/A Ranch/Davis Property. Manual removal would also not be allowed within the drainage swale B Ranch where resources were recently identified in the 150-foot wetland buffer on either side of the drainage unless mitigation measures are employed such as phasing removal efforts, installing erosion control materials, and conducting active revegetation. Mechanical removal would also not be performed in wetland buffer areas at Limantour or other project areas with recorded resources. A cultural resource monitor may be required to be present within certain areas or during certain activities at AT&T/North Beach, B Ranch/A Ranch/Davis Property, and Limantour. No biomass stockpiling or secondary access would be allowed in or through recorded resource sites. At AT&T, contractor crews may stage some equipment near the historic radio facility in the paved areas, including heavy equipment, but impacts would be minimized to the maximum extent practicable, and no permanent changes or impacts would be allowed.

Based on these factors, the selected action would not have significant effects on historic properties or other significant, archeological, or cultural resources.

5. The degree to which impacts are likely to be highly controversial.

The term “controversial” refers to cases where a substantial dispute exists as to the environmental consequences of a federal action rather than to the existence of opposition to a use. A number of Commenters are opposed in principle to the use of herbicide and, in particular, glyphosate and favor removal of invasives such as European beachgrass and iceplant by hand or no invasives removal at all. However, most of these Commenters did not call out specific inaccuracies or inadequacies in the impact analysis presented and did not dispute necessarily the environmental consequences of the action. Instead, they questioned why this approach was proposed given results of studies conducted on the human health effects of glyphosate. These results include a wide range of reported impacts associated with glyphosate, including endocrine disruption, higher rates of miscarriages, reductions in sperm count, promotion of breast cancer, heart irregularities, inflammation of eyes, skin, and digestive system, interference with liver’s cytochrome P450 oxidase enzyme system, and die-off of beneficial intestinal bacteria. In the United States, glyphosate was one of the first set of chemicals to be tested for endocrine disrupting effects by the USEPA as part of the USEPA Endocrine Disruptor Screening Program (EDSP; USEPA 2012). In March 2015, the World Health Organization announced that it was classifying glyphosate as “probably” causing cancer, although the USEPA reviewed research studies on glyphosate as recently as last year and concluded that there was “evidence of non-carcinogenicity for humans” (Pollack 2015).

A large body of literature exists on potential human health effects of herbicides, particularly on glyphosate. While some of these studies may not be universally accepted by scientists as

credible, in general, there is no dispute that studies have shown that glyphosate can potentially have adverse effects on human health. These glyphosate studies span a wide range of glyphosate types, formulations, concentrations, and settings (agriculture, forestry, laboratory studies). The toxicity of glyphosate can vary widely based on the type (acid vs. salt); formulation (whether it incorporates a surfactant and surfactant type); application method (backpack spraying, boom spray, aerial spraying, etc.), and volume of herbicide applied. In some instances, some of the surfactants integrated or combined at the factory into glyphosate formulations such as polyethoxylated tallow amine (POEA) may be even more toxic than the glyphosate itself (SERA 2011a): POEA is the surfactant incorporated into the Roundup® formulation that is available to the general public at hardware stores and other retail outlets. One of the most difficult issues in extrapolating from these studies to the proposed use is that cell culture research studies often use much higher concentrations than would ever be experienced in weed management applications. For example, glyphosate concentrations in cellular toxicity studies often range from 0.1–1% in the cell culture medium: A concentration of one percent could only be achieved in a human body by a person drinking at least half a cup of a 44% glyphosate product, representing an acute poisoning scenario (PRI 2015).

While it is often difficult to extrapolate directly from this diverse set of study approaches and results to a particular action, risk assessment analyses take all of this medical information into account in evaluating the potential for a chemical to have adverse effects given the type of chemical, application method, volume, and potential routes of exposure. The EA relies primarily on individual risk assessment reports for glyphosate and imazapyr prepared in 2011 by Syracuse Environmental Research Associates, Inc. (Manlius, NY) for the USDA/Forest Service (USFS). These reports delve with extensive detail into the reported human health risks of glyphosate and imazapyr, adjuvants and other ingredients, and impurities and metabolites, including endocrine disruption, reproductive and developmental effects, carcinogenicity and mutagenicity, skin and eye irritation and sensitization, systemic toxic effects from dermal exposure, inhalation exposure, and toxicological interactions.

In analyzing the potential effects of glyphosate and imazapyr on human health, the EA determined the possible ways that the general public – in this case, park visitors – could be exposed to applied herbicide and then evaluated the potential risks of that exposure using risk assessment worksheets developed by SERA that factor in the chemical, volume of herbicide applied per acre, and application method. In keeping with the conservative approach adopted by the USFS in evaluating impacts, the EA analysis focuses on what is considered to be the most sensitive receptors -- women of reproductive age and children. Results of these analyses indicate that the potential risk to human health posed by backpack application of low concentrations of glyphosate, imazapyr, non-ionic surfactant, and dye is not at a level that would cause concern. The only exposure routes that could increase risk to a level where it is of concern are ones that are extremely unlikely, involving children drinking water in ponds where herbicide has accidentally been dumped or women of reproductive age eating European beachgrass or iceplant.

A few Commenters disputed the accuracy and adequacy of analysis regarding the toxicity of the proposed surfactant, Competitor®, and the combination of glyphosate with Competitor® and questioned whether Competitor® could potentially enhance toxicity of glyphosate by increasing skin absorption rates. Competitor® is a non-ionic modified vegetable oil-based surfactant that is not integrated at the time of manufacturing into herbicide mixes, but added at the time of application (non-integrated). The EA incorporated analysis of the potential toxicity of these products from a separate risk assessment reports prepared by Pesticide Research Institute (Berkeley, CA; PRI 2010). All of the ingredients of Competitor® are either commonly found in

people's diets or used in consumer or pharmaceutical products and are approved as food additives by the U.S. Food and Drug Administration (USFDA), because they exhibit low toxicity. Competitor® is rated by the USEPA as Caution-level or Toxicity Class III chemical, one level higher than chemicals considered non-toxic (Toxicity Class IV). There are no individual USFS risk assessment reports on the proposed surfactant, Competitor®, or other surfactants. However, one of the reasons that the NPS selected this surfactant was because of its low toxicity, and exposure to these chemicals from coming into brief contact with treated vegetation would be comparatively negligible, particularly given the widespread exposure people already receive through diet (e.g., food, pharmaceuticals) and or skin application (e.g., cosmetics; PRI 2015).

There are no studies that address the specific combination of Competitor® with glyphosate and analyze its effect on human health. Most of the medical and other research studies performed have focused on glyphosate formulations believed to be more toxic either because of the type of glyphosate or type of surfactant integrated into the formulation -- for example, the POEA surfactant incorporated into the standard Roundup® commonly sold at hardware and other stores. POEA has received a great deal of research attention, because it is believed to be more toxic than glyphosate itself (SERA 2011a). There does not appear to be substantial scientific dispute about adverse human health effects associated with a non-ionic modified vegetable-oil-based surfactant or the combination of this type of surfactant with glyphosate.

In terms of the potential for Competitor® to enhance toxicity of glyphosate, surfactants increase the effect of an herbicide by reducing surface tension and increasing the amount of chemical that is in contact with the target (Bakke 2007). In general, non-ionic surfactants or substances have less effect on skin absorption than anionic or cationic surfactants (Bakke 2007). In transdermal drug delivery studies, the three widely used components of Competitor® (ethyl oleate, sorbitan alkylpolyethoxylate, and dialkyl polyoxyethylene glycol (PEG)) are typically utilized to enhance the permeability of non-polar substances: In contrast, glyphosate isopropylamine (IPA) salt is a polar, hydrophilic -- mixing with or dissolving into water -- compound (PRI 2015). Studies that have attempted to tease apart effects of surfactants from herbicides have largely found effects to be additive rather than synergistic, but all of the surfactants studied were of a different and more toxic type (Bakke 2007). Whether or not additive or synergistic interactions between chemicals in mixtures causes higher toxicity than the individual components depends on the toxicity of the individual components in the mixture and the rate at which they are metabolized and/or excreted: The active ingredient -- glyphosate IPA salt -- and the three components of Competitor® are polar and, therefore, sufficiently water soluble to be easily excreted without needing to be metabolized first (PRI 2015).

One of these Commenters also questioned the assumption that the window of exposure of the visiting to the glyphosate-Competitor® mixture would be limited to a short period after application. Specifically, the Commenter cited a recent study conducted by Hwang and Young (2011) for the Marin Municipal Water District in which they investigated the decay of glyphosate in soils and transport of glyphosate in stormwater run-off and through soil infiltration. The Commenter noted that the researchers found that the combination of glyphosate with Competitor® persisted on vegetation for at least three months, at which time the study ended, thereby negating the ability to determine half-life or decay rates for this combination. The concern was that the visiting public would be subject to an extended period of herbicide exposure through hiking and picnicking in the sprayed vegetation, as herbicide on the vegetation would get onto skin, clothes, and hands through physical contact and could even be ingested if food were eaten with hands that had touched sprayed vegetation. However, the results cited in this comment letter actually refer to concentrations of glyphosate found by the

researchers in the leaves of treated leaves, not necessarily on the leaves. Herbicides such as glyphosate are effective in killing plants, because they “quickly penetrate into the internal structure of plant leaves” (Gougler and Geiger 1981, Feng et al. 1998, 1999 in Hwang and Young 2011). Herbicides such as glyphosate or imazapyr that target key biochemical pathways as a mode of action would not be maximally effective unless most to not all of the chemical penetrated the leaves. During this study, the applied herbicide mixture dried within several hours after application; once the applied mixture dried, “exposure of humans to the mixture through gentle brushing up against treated vegetation is expected to be substantially less than exposure to wet herbicide mixture” (Hwang and Young 2011).

A separate Commenter disputed that native plants could be retained using selective herbicide application and felt that proposed alternative was infeasible, because it would require revegetation to establish a native dune vegetation community. Results of ongoing Seashore dune restoration projects indicate that selective spraying of invasive plants can be accomplished with very little and even no impacts to adjacent native plants particularly with use of backpack sprayers with calibrated wands and drift shields. Post-restoration monitoring indicates that native plants are reestablishing within these areas even after herbicide treatment and without removal of dead beachgrass or iceplant biomass.

Substantial dispute does not exist that herbicide risk can pose a risk to human and ecological health. Where public concern arises is about the level of risk posed by the proposed project to human health, given the myriad of laboratory and research studies that have shown glyphosate to have adverse impacts on human cells in culture mediums or on laboratory animals. However, concentrations of herbicides used in these studies often greatly exceeds those used in weed management applications, or different types of herbicide formulations – including ones with more toxic surfactants – were studied. If herbicides are used, risk cannot be totally eliminated, but, based on results of the risk assessment reports and worksheets, risk from the proposed action appears to be very, very minimal, and the Seashore has taken extensive efforts to minimize these risks to the greatest extent possible to avoid impacts to plants, animals, and humans within the park.

Other factors agencies are to take into account in determining whether significant impacts are possible include:

- *Impacts that may have both beneficial and adverse aspects and which on balance may be beneficial, but that may still have significant adverse impacts;*
- *Whether an action may establish a precedent for future actions with significant effects, or represent a decision in principle about a future consideration;*
- *Whether the action is related to other actions that may have individual insignificant impacts but cumulatively significant effects; and*
- *Whether the action threatens a violation of federal, state, or local law or requirements imposed for the protection of the environment.*

The NPS believes none of these additional factors are relevant to the Selected action. Based on the findings of the EA, as well as responses from the public and regulatory agencies, the NPS has concluded that the project will not have a significant effect on park resources or the environment and that an EIS is not necessary.

Summary of Public Involvement

Initial Scoping

A scoping letter was sent to the public on December 6, 2012, to solicit comments on dune restoration within the Seashore, the proposed compliance route, range of alternatives, and topics to be analyzed as part of the EA. The scoping letter was sent to approximately 300 parties on the park's mailing list. In addition, a project description and scoping letter was placed on the NPS Planning, Environmental, and Public Comment (PEPC) website (<http://parkplanning.nps.gov/>) and on the park's website (www.nps.gov/pore).

At the time of this letter, the proposed compliance route was preparation of a programmatic compliance document that would have covered dune restoration throughout the Seashore, but the broader scope of this type of document was judged to be better handled by future compliance efforts. Several of the high priority dune restoration areas were proposed for evaluation at project- or site-specific detail in that proposed programmatic document (AT&T; B Ranch). These projects, along with North Beach, A Ranch, Davis Property, and Limantour, are the focus of this EA.

The scoping period closed on January 15, 2013. The Seashore received 12 letters. Concerns or comments expressed in these letters included:

- *support for dune restoration;*
- *general concerns about herbicide use;*
- *concern about impacts to park agriculture from sand movement;*
- *concern about herbicide use adjacent to organic pastures;*
- *concerns about long-term management of invasives;*
- *concerns about use of a programmatic approach rather than a project-by-project - approach;*
- *request to evaluate use of hydromechanical obliteration as a possible removal technique.*

These issues and concerns are addressed in the EA.

EA Public Review Comments

The EA was released for 30-day public review on January 9, 2015. Letters announcing its availability were sent to 302 individuals, groups, organization, and libraries. The letter noted that a full copy of the EA was available for review on PEPC at <http://parkplanning.nps.gov/pore> and on the park's website. Hardcopy and CD versions of the document were also available at the Seashore's office for any who requested: there were no requests. Fifteen copies of the CDs were sent to the State Clearinghouse for distribution to a wide range of state and federal agencies (SCH# 2015012040).

The park also distributed a press release to media within the region. Several stories were published in local papers. The *Point Reyes Light* newspaper published an article on the project on January 15, 2015. The *Marin Independent Journal* ran a front-page story on Saturday, January 17, 2015, followed by publishing of an editorial cartoon the following weekend. The *West Marin Citizen* published a story on January 15, 2015, an opinion piece on January 22, 2015, and a letter-to-the-editor on February 5, 2015.

The NPS conducted public review for 30 days, with the comment period ending on Monday, February 9, 2015. Approximately 118 comment letters were received during this open comment

period either on PEPC, in email, or via hardcopy letters mailed or delivered to the park with a postmark date of February 9, 2015. Also accepted were email comments sent to Lorraine Parsons by February 9, 2015, after a member of the public pointed out that there was some ambiguity in the wording on PEPC as to whether comments could also be emailed to Ms. Parsons, as well as being submitted through PEPC. The State Clearinghouse closed the 30-day comment period for agency review on February 20, 2015. Based on a letter sent to the park dated February 23, 2015, no state agencies submitted comments during this time. (Federal agencies also received direct mail notification of the document availability through the park mailing.)

Most of the substantive comments received concerned the range of reasonable alternatives or alternative components, the adequacy of information presented on specific aspects of these alternatives (e.g., monitoring, buffers, wetland mitigation plans), and the accuracy and adequacy of information pertaining to impacts on plants, wildlife, and human health from use of herbicides, primarily glyphosate. None of the public comment letters required any modification to the alternatives or substantive changes to the impact analyses in the Environmental Consequences section. The NPS's response to comments is provided in the *Response to Comments document*. Responses to comments that appeared to necessitate correction or addition of factual information – but that did not change the evaluation of significant impacts in the EA -- were addressed using errata sheets. The combination of the EA and the *Errata* forms the complete and final record on which the FONSI is based.

Agency Coordination

The status of permitting and compliance for the proposed project is discussed in more detail in this section. The project is required to comply with a number of federal laws, some of which are administered by state agencies. Compliance or consultation would or might be required with USFWS (Endangered Species Act); California Coastal Commission (CCC; Coastal Act); the US Army Corps of Engineers (USACE; Section 404 of the Clean Water Act); San Francisco Regional Water Quality Control Board (RWQCB; Section 401 of the Clean Water Act); and State Historic Preservation Office (SHPO; Section 106).

The NPS received one comment letter from one of these agencies, the CCC. The CCC concurred with the NPS that this project would, indeed, need to conduct a federal Coastal Act consistency determination. While the NPS did not receive any communication from USFWS, the NPS has already been in contact with USFWS about the need to conduct formal consultation.

Endangered Species Act of 1973, as amended, PL 93-205, 87 Stat. 884, 16 USC §1531 et seq.

The Endangered Species Act protects threatened and endangered species, as listed by the U.S. Fish and Wildlife Service, from unauthorized take, and directs federal agencies to ensure that their actions do not jeopardize the continued existence of such species. Section 7 of the act defines federal agency responsibilities for consultation with the U.S. Fish and Wildlife Service and National Marine Fisheries Service (for marine life) and requires preparation of a Biological Assessment to analyze impacts to any threatened or endangered species that is likely to be affected by the proposal. The NPS received a list of species with potential to occur in the project area on October 3, 2012, and this was forwarded to USFWS with a request to initiate consultation (Appendix A). A copy of the scoping notice was sent to the USFWS on December 6, 2012, and the USFWS was noticed on release of the EA for public review on January 9, 2015. No comment was received. The NPS will complete its consultation with the USFWS prior to implementation of the selected action.

Archaeological Resources Protection Act of 1979, PL 96-95, 93 Stat. 712, 16 USC §470aa et seq. and 43 CFR 7, subparts A and B, 36 CFR.

This act secures the protection of archeological resources on public or Indian lands and fosters increased cooperation and exchange of information between private, government, and the professional community in order to facilitate the enforcement and education of present and future generations. It regulates excavation and collection on public and Indian lands. It requires notification of Indian tribes who may consider a site of religious or cultural importance prior to issuing a permit. Park Service staff consulted with Nick Tipon and Peter Nelson of the Federated Indians of Graton Rancheria (FIGR) on August 28, 2013, to discuss the tribe's position on some of the proposed treatment methodologies. The Park Service will meet its obligations under this Act in all activities conducted.

National Historic Preservation Act of 1966, as amended, PL 89-665, 80 Stat. 915, 16 USC §470 et seq. and 36 CFR 18, 60, 61, 63, 68, 79, 800.

The National Historic Preservation Act requires agencies to take into account the effects of their actions on properties listed in or eligible for listing in the National Register of Historic Places. The Park Service sent a scoping notice to the state historic preservation officer and the Advisory Council for Historic Preservation to initiated consultation. Consultation will continue throughout the planning process. The Park Service has been conducting its restoration at Abbott's Lagoon under an existing Section 106 agreement with the State Historic Preservation Officer (SHPO). A copy of the scoping notice was sent to the SHPO on December 6, 2012. No comment was received. Applications for Section 106 compliance under SHPO would be submitted, and approval would be required prior to implementation of the selected action.

Coastal Zone Management Act of 1972, as amended through PL 104-150, The Coastal Zone Protection Act of 1996 (16 U.S.C. §1451 et seq.).

This act protects coastal environments and transfers regulatory authority to the states and excludes federal installations from the definition of "coastal zone." Within California, the California Coastal Commission (CCC) administers the state program (California Coastal Act) for implementation of the federal Coastal Zone Management Act (CZMA). Any action by a federal agency such as the Park Service requires a federal consistency determination by the CCC as required by CZMA. The CCC manages fill, dredge, and other non-point activities affecting wetlands within the Coastal Zone. This project falls within the Coastal Zone and has areas that would be subject to oversight under the Coastal Act. Resources that might be on concern to the CCC are wetlands, environmentally sensitive habitats, natural resources on parklands, and archaeological and cultural resources. A copy of the scoping notice was sent to the CCC on December 6, 2012. No comment was received. A copy of the notice of availability of the EA was sent on January 9, 2015, and a letter was received confirming that the project would need to be submitted for a consistency determination. CCC approval would be required prior to implementation of the selected action.

Federal Water Pollution Control Act (Clean Water Act) and subsequent amendments of 1977 (33 USC §1251 et seq.).

The Clean Water Act provides for the restoration and maintenance of the physical, chemical, and biological integrity of the nation's waters. Section 404 (33 U.S.C. 1344) of the Act prohibits the discharge of fill material into navigable waters, tributaries to navigable waters, and special aquatic sites of the United States, including wetlands, except as permitted under separate regulations by the U.S. Army Corps of Engineers (the Corps) and U.S. Environmental Protection Agency (USEPA). Under Section 401 (33 U.S.C. 1341), states and tribes can assume responsibility for Section 401 oversight and can review and approve, condition, or deny all

Federal permits or licenses that might result in a discharge to state or tribal waters, including wetlands. A copy of the scoping notice was sent to the State Clearinghouse on December 6, 2012. No comment was received. A copy of the notice of EA availability was sent to all state agencies on January 20, 2015. No comment letter was received. The Park Service would evaluate the need for CWA permitting and certification/waiver on an individual project basis and submit the necessary documentation accordingly.

Any construction activity that includes clearing, grading, excavation, stockpiling, or reconstruction of existing facilities involving removal and replacement, resulting in land disturbance of 5 acres or greater, must be conducted in accordance with the **National Pollution Discharge Elimination System General permit** for Discharges of Storm Water Runoff Associated with Construction Activity (referred to as the Construction Activities Storm Water General Permit). The permit prohibits the discharge of materials other than storm water and states that storm water discharges shall not cause pollution. Non-storm water discharges are allowed only if they: 1) do not contribute to a violation of a water quality standard, 2) controlled through implementation of Best Management Practices; and 3) are infeasible to eliminate. The permit requires that construction related activities that cause or contribute to exceedance of a water quality standard must be corrected immediately and a report made to the RWQCB within 14 days. Each permitted construction site must prepare a site specific Stormwater Pollution Prevention Plan (SWPPP) prior to disturbing the site. The SWPPP must include a site description and identify BMPs that address erosion and sediment controls and management of construction waste. The SWPPP must also include post-construction controls and management of non-storm water. Applications for a NPDES would be submitted on an individual project basis depending on size and proposed approach of the project.

In addition to the CWA, wetlands are also regulated under **Executive Order 11990 (Protection of Wetlands)**. This Executive Order established the protection of wetlands and riparian systems as the official policy of the federal government. It requires all federal agencies to consider wetland protection as an important part of their policies and take action to minimize the destruction, loss or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands. Section 6 of E.O. 11990 directs federal agencies to issue procedures to implement the Executive Order. The Park Service wetland protection procedures were originally adopted together with E.O. 11988 (Floodplain Management) procedures in the 1980 " Park Service Floodplain Management and Wetland Protection Guidelines," however, in 1998, wetlands were split off from floodplains with development of Director's Order #77-1: Wetland Protection. The latest revision of this D.O. was issued in 2012. Under this policy, the Park Services requires a Statement of Findings for any proposed action that would have adverse impacts on functions and values of wetlands. These adverse impacts may be direct (e.g., placement of fill in a wetland) or indirect (e.g., secondary or offsite impacts that reach into wetlands). Some impacts associated with ecosystem restoration and certain other activities are excepted from regulation. The Park Service would evaluate the need for a Statement of Findings on an individual project basis and submit the necessary documentation accordingly.

Basis for the Decision

The Selected action accomplishes the expressed purpose and need for Coastal Dune Restoration Plan EA and is clearly superior to the continuation of the No Action Alternative, which would involve no near-term dune restoration at AT&T/North Beach, B Ranch/A Ranch/Davis, and Limantour, areas whose high ecological value is being threatened by continued expansion of non-native European beachgrass and iceplant. The project enables the park to better meet the objectives of its enabling legislation, which were focused on saving and

preserving, “for the purposes of public recreation, benefit, and inspiration, a portion of the diminishing seashore of the United States...” (Public Law 87-657).

As noted earlier, the Selected action appears to have fewer implementation-related impacts to natural and adjacent land use resources than one involving primarily mechanical removal and more long-term benefits to natural dune processes and native ecosystems and species than one using just hand removal. While mechanical removal project conducted in 2011 increased habitat for federally endangered Tidestrom’s lupine and potentially Western snowy plover, in general, these mechanical removal areas have been poorly colonized by vegetation, which has had impacts on adjacent dune, wetland, and pasture resources due to remobilization of decades of accumulated dune sands following European beachgrass removal. Manual removal has not been historically successful within the Seashore for treatment of European beachgrass due to the rhizomatous nature of this invasive species, the depths to which its rhizomes extend, its propensity for re-establishing through rhizome or vegetative fragments, and the constant re-treatment necessary to maintain restored areas. Both mechanical and manual removal would ultimately be more expensive on a per-acre basis (as much as ~10X), which would reduce the extent of dune that could be restored, as well, as funding for restoration efforts tend to be limited and focused on options that are the most cost-effective.

Potential impacts associated with chemical control are minimized through an extensive number of avoidance and mitigation measures. Buffers would be established around rare plants (unless drift shield employed), breeding and certain non-breeding wildlife, and wetlands, as well as between the project area and adjacent organic pastures. The park would continue to implement strict climatic restrictions on spray activities. There would be no spraying during rainfall events or moderate or heavy fog, 24 hours preceding a predicted rainfall event with at least a 20% probability of occurring, or 24 hours after a rainfall event or until plants are dry. Herbicides would also not be applied when the average wind speed exceeds 10 mph at the level of the targeted plants or when maximum wind speed gusts frequently exceed 10 mph.

The Selected action does comply with NPS Management Policies and other federal policy directives and objectives by restoring natural dune process, enhancing habitat for at least five (5) federally listed species, and complying with requirements for mitigating any long-term loss of wetlands from dune migration. In addition, the projects would improve resiliency of these systems in face of threats from climate change such as sea level rise and increased wave- and wind-induced erosion by allowing dunes to migrate or move in response to these pressures. While, over the short-term, the projects would require vigilant initial maintenance to ensure that European beachgrass and iceplant are successfully eradicated, over the long-term (15-20 years), the projects are expected to become self-sustaining, requiring only occasional site visits to ensure that European beachgrass and iceplant have not reestablished.

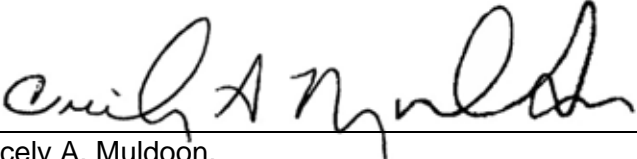
Conclusions

In coming to its decision, the NPS considered the range of alternatives, the potential impacts that may be generated by the Selected action, and whether to prepare a site-specific Environmental Impact Statement (EIS). The Selected action best accomplishes the overall project objectives in keeping with the legislated purposes and the legal mandates of the NPS. Based on this detailed review, the NPS concludes that appropriate alternatives to the Selected action have been analyzed and that the project will not generate any significant new or different environmental impacts requiring preparation of an EIS. Based on the environmental impact analysis documented in the EA, the capability of mitigations to reduce or avoid potential impacts, and, with due consideration of the nature of public comment, the NPS has determined that the Selected action is not a major federal action which could significantly affect the quality of the human environment.

In conclusion, the Coastal Dune Restoration Plan does not constitute an action that would normally require the preparation of an EIS. It is consistent with NPS Management Policies (2006) and the Seashore General Management Plan (1980). The project would not have a significant impact on any aspect of the human environment, including public health and safety, cultural resources, or federally-protected species. The Selected action would not cause significant negative indirect or cumulative effects and would not set a precedent for future actions. Implementation of the action would not violate any federal, state, or local law.

Therefore, in accordance with the National Environmental Policy Act of 1969 and regulations of the Council on Environmental Quality (40 CFR 1508.9), the selected alternative for the Coastal Dune Restoration Plan will be implemented as soon as practical, and an EIS will not be prepared.

Recommended:

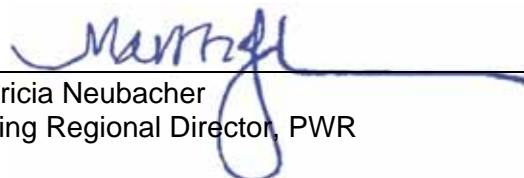


Cicely A. Muldoon, Superintendent, Point Reyes National Seashore

5/8/2015

Date

Approved:



for Patricia Neubacher, Acting Regional Director, PWR

5/12/15

Date

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Summary of Prescribed Resource Protection Measures

Impact	Prescribed Measure	Responsibility ¹
1. Natural Resources		
Special Status Species	<p>All Species:</p> <ol style="list-style-type: none"> Construction personnel will be educated regarding constraints and responsibilities in working in habitat with listed species 	<ol style="list-style-type: none"> Contractor and NPS-RM
	<p>Western Snowy Plover:</p> <ol style="list-style-type: none"> No invasives treatment within 500 feet of active nests Biological monitor to survey areas before construction 	<ol style="list-style-type: none"> NPS-RM & Contractor/ Construction NPS-RM/ Pre-Construction & Construction
	<p>Myrtle's Silverspot:</p> <ol style="list-style-type: none"> 10 mph speed limit for vehicles within primary flight season (June 15-Aug 31) Larval areas (including western dog violet) flagged to reroute traffic. Limited work in main population areas during primary flight season (June 15-Aug 31) Prescribed burning scheduled in fall, outside of butterfly flight season. Mow or foam buffer around dune mat to avoid burning habitat. 	<ol style="list-style-type: none"> NPS-RM & Contractor/ Construction NPS-RM & Contractor/ Construction NPS-RM & Contractor/ Scheduling NPS-RM & NPS-Fire/ Construction
	<p>California Red-Legged Frog:</p> <ol style="list-style-type: none"> Biological monitor to survey construction areas for CRLF suitability prior to construction start. Suitable habitat surveyed 48 hours or less prior to construction start No construction in documented CRLF aquatic habitat before July 31 100-foot buffer required between construction and documented CRLF habitat between Dec. 31 and July 31, unless silt fence installed, or daily construction monitoring occurs. If a frog is observed, the animal(s) will be captured only by qualified personnel and relocated to an appropriate adjacent suitable habitat outside work area. No herbicide spraying within 60 feet of currently occupied CRLF aquatic habitat. No prescribed burning conducted in wetlands, with 25-foot buffer established. 	<ol style="list-style-type: none"> NPS-RM and Contractor/ Pre-Construction NPS-RM and Contractor/ Pre-Construction Contractor/Scheduling NPS-RM & Contractor/ Construction NPS-RM & Contractor/ Construction NPS-RM & Contractor/ Construction NPS-RM and NPS-Fire/ Construction
	<p>Special Status Plant Species - Beach Layia, Tidestrom's Lupine, and Sonoma alopecurus</p> <ol style="list-style-type: none"> Biological monitor survey restoration area and flag location of rare plants No access for equipment through native dune communities. Backpack sprayers used with directed, calibrated nozzles No spraying within 10 feet of rare plants unless drift shield used. Spraying only when average wind speed less than 10 mph or average gusts less than 10 mph. No spraying during heavy fog conditions or when 24 hours before rainfall event with >20% probability or 24 hours after a rainfall event Rare plants largely avoided through protection of native dune mat vegetation communities during prescribed burning. 	<ol style="list-style-type: none"> NPS-RM NPS-RM & Contractor/ Construction NPS-RM & Contractor/ Construction NPS-RM & Contractor/ Construction NPS-RM & Contractor/ Construction NPS-RM & Contractor/ Construction NPS-RM & NPS-Fire/ Construction

Summary of Prescribed Resource Protection Measures

Impact	Prescribed Measure	Responsibility ¹
	<p><i>Nesting Bird Species</i></p> <ol style="list-style-type: none"> Between March 1–August 15, preconstruction surveys for migratory birds and nests conducted no more than 1 week prior to construction start. If active nests of non-listed migratory birds found, 100-foot exclusion zones established around nests to minimize disturbance-related impacts. If active nests of special-status migratory birds found, exclusion zones established around nests, with width determined in consultation with USFWS 	<ol style="list-style-type: none"> NPS-RM & Contractor/ Construction NPS-RM & Contractor/ Construction NPS-RM & Contractor/ Construction
Vegetation	<p><i>Native Species-Dominated Dune Mat Communities</i></p> <ol style="list-style-type: none"> No access through areas without concurrence of biological monitor that resources of concern are not present and no other route available. Native dune mat species will be avoided during spraying or drift shield used. Foot traffic only allowed with concurrence of biological monitor that access would not affect reproductive success of plants. 20-foot fuel break enforced for burning. <p><u>Measures specific to herbicides:</u> See <i>Special Status Plant Species</i> above.</p>	<ol style="list-style-type: none"> NPS-RM & Contractor/ Construction NPS-RM & Contractor/ Construction NPS-RM & Contractor/ Construction NPS-RM & NPS-Fire/ Construction
Vegetation	<p><i>Measures to Protect Vegetation and Prevent the Introduction and Spread of Invasive Plant Species</i></p> <ol style="list-style-type: none"> Tires and tracks of trucks and equipment washed off before entering and after leaving project sites to prevent seed transport. 	<ol style="list-style-type: none"> Contractor/Construction
Water Resources/ Wetlands	<ol style="list-style-type: none"> Biological monitor survey restoration area and flag location of wetlands To the maximum extent practicable, construction access and staging shall occur in uplands. No construction access through wetlands without permission of environmental monitor and NPS. If construction access or staging must occur in wetlands, access within these areas shall be kept to the minimum road width and acreage possible. Construction access routes will be flagged to ensure that construction equipment does not detour from authorized entry points and access routes. Any temporary “fill” or staging material placed in wetlands will be removed to upland locations at the earliest possible date. If mechanical removal used in buffer areas, silt fencing will be placed between the wetland and the excavation area with bottom of fencing stapled to prevent fallback of sands into wetlands. No spraying within 25-foot buffer for wetlands Hand removal only in wetlands <p><u>Measures specific to herbicides:</u> See <i>Special Status Plant Species</i> above.</p>	<ol style="list-style-type: none"> NPS-RM Contractor/Construction Contractor/Construction Contractor/Construction Contractor/Construction NPS-RM & Contractor/ Construction NPS-RM & Contractor/ Construction NPS-RM & Contractor/ Construction
Water Resources /Water Quality	<ol style="list-style-type: none"> Conduct construction work in accordance with site-specific construction plans that minimize the potential for increased delivery of sediment to surface waters of adjacent wetlands and water bodies. Minimize the extent of areas to be cleared, graded, recontoured, or otherwise disturbed. Grade and stabilize spoils sites to minimize erosion and sediment input to surface waters and generation of fugitive dust (see discussions under <i>Measures to Protect Air Quality</i>). As appropriate, implement erosion control measures to prevent sediment from entering surface waters, including the use of silt fencing or fiber rolls to trap sediments and erosion control blankets on slopes and channel banks. 25-foot fuel break enforced for burning. <p><u>Measures specific to herbicides:</u></p> <ol style="list-style-type: none"> No spraying during heavy fog conditions or when 24 hours before rainfall event with >20% probability or 24 hours after a rainfall event Spraying only when average wind speed less than 10 mph or average gusts less than 10 mph. 	<ol style="list-style-type: none"> Contractor/Construction Contractor/Construction Contractor/Construction Contractor/Construction NPS-RM & NPS-Fire/ Construction NPS-RM & Contractor/ Construction NPS-RM & Contractor/ Construction

Summary of Prescribed Resource Protection Measures

Impact	Prescribed Measure	Responsibility ¹
Spill Prevention and Response Plan	<ol style="list-style-type: none"> 1. Standard spill prevention and response measures be instituted that apply to the use of hazardous and toxic materials, such as fuels and lubricants for construction equipment. 2. Workers trained to avoid and manage spills. 3. Construction and maintenance materials prevented from entering surface waters and groundwater; 4. All spills cleaned up immediately 5. Appropriate agencies are notified of any spills and of cleanup procedures employed. 6. Spill containment and erosion control supplies kept on site to facilitate quick response to unanticipated storm events or emergencies. 7. Staging and storage areas for equipment, materials, fuels, lubricants, solvents, herbicide mixing, and other possible contaminants located at least 100 feet away from surface waters. 8. No vehicles are fueled, lubricated, or otherwise serviced within the normal high-water area of any surface water body; 9. Fueling/mixing area covered with impervious material and bermed. 10. Vehicles are immediately removed from work areas if they are leaking; and frequently checked for leaks 11. No equipment is operated in flowing water (suitable temporary structures are installed to divert water around in-channel work areas). 	<ol style="list-style-type: none"> 1. Contractor & NPS/ Maintenance 2. Contractor/Construction 3. Contractor/Construction 4. Contractor/Construction 5. Contractor/Construction 6. Contractor/Construction 7. Contractor/Construction 8. Contractor/Construction 9. Contractor/Construction 10. Contractor/Construction 11. Contractor/Construction
Air Quality	<ol style="list-style-type: none"> 1. Limit the area subject to excavation, grading, and other construction activity at any one time. 2. Water unpaved access roads, parking areas, and staging areas as necessary 3. Enclose, cover, water, or apply nontoxic soil stabilizers to exposed stockpiles as necessary. 4. Maintain properly tuned equipment and limit idling time to 5 minutes. 5. Cover trucks hauling soil, sand, or other loose materials, or require them to maintain at least 2 feet of freeboard. 6. Limit traffic speeds on unpaved roads to 10 mph. 	<ol style="list-style-type: none"> 1. Contractor/Construction 2. Contractor/Construction 3. Contractor/Construction 4. Contractor/Construction 5. Contractor/Construction 6. Contractor/Construction
2. Cultural Resources	<ol style="list-style-type: none"> 1. Cultural resource surveys required prior to project start. 2. Areas denoted as archaeologically sensitive may require avoidance or presence of cultural resource monitor. 3. Contractors to halt immediately and contact park staff if potential remains, artifacts, or other resources found. 4. No mechanical excavation below into dark-colored soil horizons that may be more likely to contain archaeological resources. 5. No invasives removal in and immediately adjacent to areas in sensitive archaeological areas within B Ranch or other project areas unless special mitigation measures undertaken in consultation with NPS cultural resources staff. 	<ol style="list-style-type: none"> 1. NPS - CR 2. NPS – CR & Contractor/ Construction 3. Contractor/Construction 4. Contractor/Construction 5. Contractor & NPS – CR/ Construction
3. Neighboring Land Uses	<ol style="list-style-type: none"> 1. Coordinate all projects, including staging, access, and implementation, with adjacent land owners, lessees. 2. Use existing ranch roads, where possible. 3. Stage operations outside of pastures, when possible. 4. Maintain all roads, fencing, and gate in original condition. 5. Conduct active revegetation, phasing in backdune areas, possible sand stabilization measures to minimize sand remobilization. 6. 25-foot buffer between spraying of herbicide and adjacent areas designated as Organic Crop or Organic Livestock to comply with recommendations of NCAAT and County of Marin standards. Hand or mechanical removal only in buffers. 7. Taper back dune slopes to minimize sand remobilization when mechanical removal used. 	<ol style="list-style-type: none"> 1. NPS-RM 2. NPS – RM & Contractors/ Construction 3. NPS – RM & Contractors/ Construction 4. NPS – RM & Contractors/ Construction 5. NPS – RM & Contractors/ Construction 6. NPS – RM & Contractors/ Construction 7. NPS – RM & Contractors/ Construction

Summary of Prescribed Resource Protection Measures

Impact	Prescribed Measure	Responsibility ¹
4. Wilderness	<ol style="list-style-type: none"> 1. No staging in wilderness areas. 2. Access minimized to the maximum extent practicable. 3. Vehicles parked outside wilderness when not being used. 4. Amount of mechanical removal in wilderness minimized to the maximum extent practicable. 5. Any changes to these measures would require reinitiation of Minimum Requirements analysis. 	<ol style="list-style-type: none"> 1. NPS – RM & Contractor/ Construction 2. NPS – RM & Contractor/ Construction 3. NPS – RM & Contractor/ Construction 4. NPS – RM & Contractor/ Construction 5. NPS – RM & Contractor/ Construction
5. Visitor Experience	<ol style="list-style-type: none"> 1. Information on project provided at trailhead, Visitor's Centers, and website. 2. In general, construction will take place between 7:00 a.m. and 7:00 p.m., Monday through Friday, with weekends permissible only by permission from NPS. 3. Herbicides used in strict accordance with weather restrictions, PUP requirements. Herbicide treatment areas closed during and 24 hours after treatment or as required by label. 4. Mechanical removal areas closed to public. 5. Closures posted at access points, Visitor's Centers, and website. 6. Burn Plans submitted for approval prior to prescribed burn activities. 7. Prior notice provided to sensitive receptors within potentially affected areas. 8. Notice of proposed burns posted at trailheads, access points, Visitor's Centers, and website. <p><i>See additional measures under Soundscapes</i></p>	<ol style="list-style-type: none"> 1. NPS-RM/Construction 2. NPS-RM & Contractor/ Construction 3. NPS-RM & Contractor/ Construction 4. NPS-RM & Contractor/ Construction 5. NPS-RM/Construction 6. NPS-RM & Contractor/ Pre-Construction 7. NPS-Fire/Pre-Construction 8. NPS-RM/Construction
6. Soundscapes	<ol style="list-style-type: none"> 1. Construction equipment required to have sound-control devices at least as effective as those originally provided by the manufacturer 2. No equipment operated with an unmuffled exhaust 3. Idling of equipment limited to 10 minutes 4. Contractor to work with NPS on minimizing noise to the maximum extent practicable 	<ol style="list-style-type: none"> 1. Contractor/Construction 2. Contractor/Construction 3. Contractor/Construction 4. NPS – RM & Contractor/ Construction
5. Public Health and Safety	<p><i>See measures under Visitor Experience</i></p> <ol style="list-style-type: none"> 1. Contractors required to submit an Accident Prevention Plan for NPS approval. 2. Herbicides used in accordance with a Pesticide Use Proposal approved by the Pacific West Region Integrated Pest Management coordinator 3. Herbicide applications conducted by state-certified applicators 4. All herbicide use conducted in compliance with manufacturers' labels and only under prescribed weather conditions. 5. Calibrated backback sprayers used to avoid overspraying. 6. Traffic Safety Plan required that will address travel routes, closure plans, detour plans (if any), flagperson requirements (if any), locations of turnouts to be constructed (if any), coordination with law enforcement and fire control agencies, measures ensuring emergency access, and additional need for traffic or speed-limit signs. 7. Construction worker parking and access managed to avoid impeding access for park visitors and emergency vehicles. 	<ol style="list-style-type: none"> 1. Contractor/ Pre-Construction 2. NPS – RM & Contractor/ Construction 3. NPS – RM & Contractor/ Construction 4. NPS – RM & Contractor/ Construction 5. NPS – RM & Contractor/ Construction 6. Contractor/Construction 7. NPS – RM & Contractor/ Construction

¹ Responsibility indicates responsible party(ies) and period of project when applicable.

Non-Impairment Determination Coastal Dune Restoration EA Point Reyes National Seashore

To assure fulfillment of the National Park Service (NPS) mission, NPS Management Policies (NPS 2006) require decision-makers to consider impacts and determine in writing that a proposed action will not lead to an impairment of park resources and values before approving the action. The Management Policies state that impairment prohibited by the Organic Act is an impact that, in the professional judgment of the responsible NPS manager, would "harm the integrity of park resources or values, including the opportunities that would otherwise be present for the enjoyment of those resources or values." The Management Policies further provide specific guidance for NPS managers to use in analyzing whether a proposed action would result in impairment. The Management Policies state that "...an impact would be more likely to constitute an impairment to the extent that it affects a resource or value whose conservation is:

- necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park;
- key to the natural or cultural integrity of the park or to the opportunities for enjoyment of the park; or
- identified as a goal in the park's general management plan or other relevant National Park Service planning documents" (NPS 2006).

The effects of the Selected action have been analyzed for possible impairment of NPS resources and values. A full analysis of potential effects in the environmental assessment of the proposed actions has determined that the project would not result in impairment of NPS resources. The project will result in short-term disturbances during the period of construction, but none of these would be more than moderate in intensity, and none would meet any of the three criteria for impairment outlined above. Restoration of the proposed project areas would result in many benefits to park resources and values, including improved or enhanced physical dune processes and ecological function and improved resiliency of this ecosystem in the face of threats from climate change. As identified in the Environmental Assessment (EA), the project may result in long-term, indirect impacts to wetlands through some movement of dunes once European beachgrass and iceplant have been removed, although the degree of potential migration has been greatly reduced through selection of chemical treatment as the primary removal approach. Through implementation of the proposed mitigation measures, this impact has been judged to not have more than a minor impact on wetlands. Impacts to federally listed species have also been avoided or reduced substantially through extensive mitigation measures. The Selected action also will not impair historic properties and the cultural integrity of the Seashore.

The actions approved under this project would result in substantial restoration to resources that are key to the natural integrity of this coastal park and its valuable ecosystems and sensitive species and to opportunities for enjoyment of the park by the thousands of visitors that come to this area each year. The project is also consistent with the park's enabling legislation, with the identified goals of its General Management Plan, and with preserving the natural and cultural integrity and opportunities for public enjoyment of the park.

Conclusion

As described above, the adverse effects and environmental impacts anticipated as a result of implementing the selected alternative will not rise to levels that impair resources or values whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation for the Seashore; (2) key to the natural or cultural integrity of the park; or (3) identified as a goal in the park's General Management Plan or other relevant NPS planning documents.