July 22, 2008

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P.1081
YOSEMITE NATIONAL PARK

Superintendent
Attn: High-elevation Aquatic Resources Management Plan
P.O. Box 577
Yosemite, CA 95389

Dear Superintendent:

This letter provides my scoping comments on Yosemite's High-elevation Aquatic Resources Management (HARM) Plan. It is my hope that you will use this opportunity to craft a strong plan to protect Yosemite's fragile high-elevation resources from the harm being caused by recreation and administrative activities. Please consider the following specific comments:

Because domestic livestock (such as horses and mules) spread weeds, contaminate water with pathogens and foul odors, harm threatened species (such as the Yosemite toad), compete with wildlife for forage, frighten native mammals (such as the Sierra Nevada bighorn sheep), and cause substantial erosion of trails, your HARM Plan should include an alternative to phase out all domestic stock use (except for essential administrative purposes) throughout Yosemite's high country.
Because the High Sierra Camps pollute Yosemite's high-elevation aquatic ecosystems (with human sewage, gray water, livestock manure, soil erosion, etc.), these archaic commercial developments should be closed, and the sites restored. Your HARM Plan should embrace this opportunity to protect Yosemite's high country by closing these polluting developments as soon as possible.

Sincerely,

[redacted]

New Brighton, MN 55112

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New Brighton, MN 55112

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Superintendent
Attn: High-Elevation Aquatic Resource Mgmt Plan
P.O. Box 577
Yosemite, CA 95389

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PO BOX 8920 SO. LAKE TAHOE CA 96158

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JUL 25 2008
P. 18820
YOSEMITE NATIONAL PARK

July 25, 2008

Superintendent, Yosemite National Park
Attn: High-elevation Aquatic Resources Management Plan
P.O. Box 577
Yosemite, CA 95389

SUBJECT: SCOPING COMMENTS ON PROPOSED "HIGH-ELEVATION AQUATIC RESOURCES MANAGEMENT PLAN"

Dear Superintendent Tollefson,

The High Sierra Hikers Association (HSHA) is a nonprofit public-benefit organization that seeks to inform and educate its members, public agencies, and the general public about issues affecting hikers and the High Sierra, and that also seeks to protect and restore the High Sierra for the benefit of present and future generations. This letter transmits our scoping comments on your staff's proposed **High-elevation Aquatic Resources Management (HARM) Plan**.

Many of the HSHA's 700+ members visit Yosemite National Park, including the areas that would be directly affected by this proposal, for hiking, camping, backpacking, horse packing, and other recreational pursuits. The HSHA is very concerned about the ongoing (and increasing) adverse impacts to the aquatic environment and wilderness character of Yosemite National Park due to commercial, administrative, and non-commercial activities in the Yosemite high country.

This letter incorporates by reference the project file for your Vogelsang water/utilities construction proposal, because the projects are very much related. In fact, the two projects should be combined. The current piecemeal approach to addressing water pollution issues in Yosemite's high country is inefficient, disingenuous and against the public interest. Such a disjointed, uncoordinated, piecemeal approach to water pollution issues at Yosemite favors only the commercial interests that want to see business-as-usual prevail.

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Background

The National Park Service at Yosemite has for many decades conducted, permitted and/or condoned activities that are known to harm high-elevation aquatic resources. For example, commercial packtrains have long been permitted to overgraze, trample and pollute sensitive high-elevation wetland meadows, lakeshores and streams with little or no oversight by the Park Service. The permits for such commercial activities are routinely "rubber-stamped" by the Park Service with little or no analysis, few or no limits, and vague, non-binding or no mitigation measures. In order for potentially harmful activities (such as commercial packtrains) to be legally permitted via NEPA "categorical exclusions," the activities must be limited, controlled and mitigated to levels of insignificance. Considered in this context, the proposed High-elevation Aquatic Resources Management (HARM) Plan provides an historic opportunity for the Park Service to finally rein in the ongoing harm being caused by commercial, administrative and certain non-commercial activities in the Yosemite high country, and we appreciate this opportunity to provide comments.

High Sierra Camps

The High Sierra Camps (HSCs) are aged, ugly and polluting facilities that have significant negative impacts on the aquatic and terrestrial environments of Yosemite and on the experience of countless park visitors. All the by-products of human occupancy are produced at the camps: sewage, "gray water" from washing, grease and detergent from kitchens, etc. The wastewater and sewage produced at the camps pollutes the meadows, soils, wetlands and waters of Yosemite National Park.

Congress specifically recognized these threats to Yosemite when it passed the California Wilderness Act of 1984. That Act, signed by President Reagan, bestowed formal wilderness designation upon much of the Yosemite backcountry. Congress allowed the HSCs to temporarily remain, but stated:

> "...If and when it occurs that the continued operation of these facilities...results in an increased adverse impact on the adjacent wilderness environment (including increased adverse impact on the natural environment within the enclaves themselves), the operation of these facilities shall be promptly terminated, the facilities removed, the sites naturalized, and in the procedure set forth by section 9 of the bill, the areas promptly designated as wilderness."

and:

> "...Because of the importance of continuing monitoring and assessment of this situation, immediately upon enactment of this bill into law, the Secretary of the Interior should document current baseline operational and environmental impact conditions of all of these facilities [HSC camps], and he should also, within one year of the date of enactment,

> report in writing to the relevant committee of the House and Senate, his findings and recommendations as to this matter. Annual assessments of this situation should thereafter be made by the Secretary to assure continued monitoring of conditions." (House Committee Report No. 98-40)

The Park Service has never made any effort to prepare the baseline reports or the annual monitoring reports that Congress requested decades ago. Why? Because past NPS managers have been hell-bent on promoting the commercial developments at all cost, and have made every effort to "band-aid" and cover up the many harmful impacts of the HSCs. We hope you will agree that it is time to reverse such dishonest and blindly pro-development policies.

Yosemite's 1980 General Management Plan (GMP), which preceded the California Wilderness Act by four years, states:

> "...Potential wilderness classification will prevent any further development of facilities or services; should existing developments be removed, there will be no reconstruction of facilities. Wilderness classification will require the eventual elimination of all improvements that do not conform with wilderness activities. Use of wilderness areas will be restricted to activities that are compatible with wilderness as cited in the Wilderness Recommendation for Yosemite."

That sounds quite clear, doesn't it?

Please consider one example that illustrates the issues surrounding the HSCs: After Congress passed the 1984 California Wilderness Act it became evident that the sewage disposal system at Vogelsang HSC was failing, and the wetlands and streams around the Vogelsang HSC were being threatened by wastewater from the camp. Instead of closing the camp, as required by law and by common sense, the Park Service in 1985 constructed a new "leach mound" system in an effort to contain the wastes (i.e., building a huge mound of soil, discharging the wastes into the pile, and looking the other way and simply hoping for the best). The project involved a great amount of explosives, soil and wetlands disturbance, and helicopter use. But the fix was short-lived. By 1990 it was obvious to the Yosemite administration and to the Curry Company (the operator of the camp) that the mound system was a failure:

> "After several seasons of continuing environmental concerns, NPS maintenance representatives have determined that the mound system for sewage disposal at the Vogelsang High Sierra Camp is inadequate to properly handle solid wastes generated by Camp guests and employees." (Yosemite National Park Project Proposal Form, dated 1/16/91.)

In other words, sewage and wastewater from the camp was leaking from the mound and polluting surrounding wetlands and waters. At this point, as in 1985, the only intelligent action

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would have been to close the camp, naturalize the site, and designate it as wilderness. Nevertheless, in the summer of 1991, without asking for public comment, the Park Service once again ignored the law and secretly set about to control the wastes by constructing more new toilet facilities at Vogelsang HSC.

And now, because of *"public health and safety issues and utility deficiencies at the Vogelsang High Sierra Camp"* the Park Service is again proposing more band-aids at the camp. Given the long overdue but welcome acknowledgment that the high-elevation aquatic ecosystems of Yosemite deserve protection (i.e., Yosemite Public Scoping Announcement for HARM Plan, June 9, 2008), the time has come to stop the dishonesty, stop the cover-ups, stop the clandestine helicopter use, stop the "band-aid" attempts to mitigate the harm caused by the HSCs, and close the camps once and for all.

In addition to the pollution caused by sewage and wastewater disposal at the camps, the trails traversed by the commercial HSC pack trains are battered and polluted by constant stock use, featuring flies and stench and dust. Such impacts substantially harm many park visitors (see, for example, Absher 1979, Cole 1990, Stankey 1973, Watson et al. 1993, and the many public comments submitted for this project and the concurrent Vogelsang utilities band-aid project). Further, studies by scientists from the University of California (U.C. Davis Medical School) document that waters within Yosemite National Park are being contaminated and that: ***"pack animals are most likely the source of coliform* [bacteria] *pollution"*** (Derlet and Carlson 2006). A recent report has confirmed the earlier findings that packstock are polluting water in Yosemite and elsewhere in the High Sierra (see Derlet and others 2008).

The High Sierra Camps are an anachronism—an out-of-date holdover from the bad old days of the 1920s through the early 1960s, when more development and more commercialism were considered desirable and beneficial. It is time for the Park Service to catch up with the times (and pay attention to its Organic Act) by choosing preservation of high-elevation aquatic resources, scenery, wilderness character, and wild river values over the ongoing exploitation and impairment that are perpetuated by these ugly and polluting camps. Your HARM Plan should carefully evaluate and disclose the impacts of these commercial developments on high-elevation aquatic resources (including surface waters, ground waters, riparian areas, wetlands, lakeshores, wildlife, and associated terrestrial habitats), and propose, once and for all, to abolish these archaic, polluting slums of the Yosemite high country.

Domestic Stock Animals in Yosemite's High Elevations

The use of stock animals may be sometimes necessary for certain recreational and/or administrative purposes. We want to make clear that we do <u>not</u> advocate or suggest the complete elimination of recreational or administrative stock use from Yosemite National Park. Our primary concern is that <u>the NPS must acknowledge and substantially reduce the many adverse impacts that are occurring due to the currently excessive and poorly regulated use of stock animals in Yosemite's high country</u>.

We are aware that commercial packstock activities and impacts have increased substantially in recent years in Yosemite, yet the Park Service has made almost no effort to establish limits or require modern practices to prevent pollution caused by pack and saddle stock. Your planning process should begin by producing a complete disclosure of the cumulative stock use, associated facilities, and impacts to aquatic ecosystems that have occurred over the past few decades. Then, your plan should, at minimum, significantly reduce/control commercial, administrative and private stock use to avoid the identified direct, indirect and cumulative impacts, and incorporate definitive limits on the number of allowable "stock days" to prevent future increases in harmful stock animal uses. Further, commercial stock use within designated wilderness must be allowed only to the extent that it is necessary and proper under the Wilderness Act.

Quotas and Permits for Commercial Stock Outfitters

The Yosemite backcountry is so popular that quotas on its use have been implemented to prevent unacceptable impacts. We support the implementation of restrictions designed to protect park, wilderness, and wild & scenic river values. However, we remain concerned that commercial outfitters are allowed easy access when the general public is turned away due to use quotas.

A fundamental tenet of environmental science that must be acknowledged is that one horse (or mule) can produce ***at least*** as much impact as several people (see references below). Your environmental document for this project should state clearly that: (1) Commercial stock use of Yosemite's high-elevation areas is a privilege—not a right, and (2) Commercial stock use shall not be given priority over self-guided visitors. Wherever rationing (i.e., a quota system) is necessary, commercial stock use (including animals used to service the HSCs), should be reduced to maximize the number of people allowed to enjoy the area.

In addition, all commercial outfitters (or their clients) should have to wait in line with the rest of the public to obtain wilderness reservations and permits to use the Yosemite high country. Commercial packstock enterprises should never be allowed to issue their own permits to conduct commercial operations in Yosemite National Park. (This is a ridiculous notion, and one that illustrates the unfair special treatment that commercial packers receive from land managers in some areas.)

Impacts to meadows, stream zones, wetlands, and lakeshores

Numerous studies have documented adverse impacts to mountain meadows caused by stock animals used for recreation (Cole 1977, Merkle 1963, Nagy and Scotter 1974, Neuman 1990 & 1991a-b, Strand 1972, Strand 1979a-c, Sumner and Leonard 1947, Weaver and Dale 1978).

Trampling and grazing by livestock are known to increase soil compaction and to contribute to streambank erosion, sedimentation, widening and shallowing of channels, elevated stream temperatures, and physical destruction of vegetation (Behnke and Raliegh 1978, Bohn and Buckhouse 1985, Kauffman and Krueger 1984, Kauffman et al. 1983, Siekert et al. 1985). Streambanks and lakeshores are particularly susceptible to trampling because of their high moisture content (Marlow and Pogacnik 1985). Unstable streambanks lead to accelerated erosion and elevated instream sediment loads (Duff 1979, Winegar 1977).

In sum, the impacts of recreational stock animals on meadows, streams, wetlands, and lakeshores are substantial, and need to be addressed in this planning process.

Water quality impacts of stock animals

Stock urine and manure contribute to eutrophication of streams and lakes (see Stanley et al. 1979, Derlet and others 2008). Such impacts are a significant concern in the oligotrophic aquatic environments of Yosemite National Park. For example, a recent publication by the National Academy of Sciences documents that nutrients from livestock wastes can cause deformities in amphibians. *See* Johnson et al. 2007 "Aquatic Eutrophication Promotes Pathogenic Infection in Amphibians":

http://www.colorado.edu/eeb/facultysites/pieter/documents/Johnson%20et%20al.%202007.pdf

Livestock manure can also pollute water with harmful bacteria and other organisms such as *Aeromonas, Salmonella, E coli, Giardia* and *Cryptosporidium,* which are pathogenic to humans and other animals. (See, for example, Derlet and Carlson 2006, Derlet and others 2008).

Some stock users continue to claim that the strains of *Giardia* and *Campylobacter* spread by domestic livestock are not infective to humans. This is wishful thinking, and is counter to the available scientific evidence. The cross-transmission of enteric pathogens from stock animals is certainly not completely understood, however, there is a substantial and increasing body of evidence demonstrating that pathogenic bacteria, protozoa, and other harmful pathogens can be spread from stock animals to humans (Bemrick 1968, Blaser et al. 1984, Buret et al. 1990, Capon et al. 1989, Davies and Hibler 1979, Derlet and Carlson 2002, Derlet and Carlson 2006, Derlet and others 2008, Faubert 1988, Isaac-Renton 1993, Kasprzak and Pawlowski 1989, Kirkpatrick and Skand 1985, Kirkpatrick 1989, LeChevallier et al. 1991, Manahan 1970, Manser and Dalziel 1985, Meyer 1988, Rosquist 1984, Saeed et al. 1993, Stranden et al. 1990, Suk 1983, Suk et al. 1986, Taylor et al. 1983, Upcroft and Upcroft 1994, Weniger et al. 1983, Xiao et al. 1993).

Specifically, Derlet and Carlson (2002) found pathogenic organisms in 15 of 81 manure samples collected from pack animals along the John Muir Trail. This documents that about twenty percent of the manure piles in the Sierra contain potentially pathogenic organisms (i.e., organisms that may cause disease in humans). Pack animal manure collected in the Tuolumne River/Meadows areas contained pathogenic bacteria as well as *Giardia*. Derlet and Carlson

(2006) also found pathogenic bacteria in surface waters of Yosemite's high country, and concluded that: ***"pack animals are most likely the source of coliform* [bacteria] *pollution."*** A recent report confirms those findings:

> "The finding of a high prevalence of coliforms in wilderness areas frequented by pack animals is important...Pack animals produce high volumes of manure, which is deposited directly onto the surface of trails, soil, or meadows. In contrast to human waste, pack animal manure is not buried in the soil. Manure deposited on the ground can be swept into streams during summer rains or spring snow runoff...Fecal contamination, as indicated by the finding of coliforms, would place the watershed at risk for harboring microbes capable of causing human disease. As is the case with cattle, these threats include certain pathogenic strains of *E coli, Salmonella, Campylobacter, Aeromonas,* and protozoa such as *Giardia*. Pack animals entering the High Sierra have been subject to analysis, and *Giardia* has been found in their manure. The organism *Hafnia alvei* was found in one study conducted along the John Muir Trail in the Sierra Nevada, even in old manure. *H alvei* can cause diarrhea in humans...In comparison to Pack Animal sites, only a small percentage of Backpacker sites had coliforms. This finding would support the conclusion that most of the microbial contamination in pack animal areas is a result of pack animal manure...In wilderness areas where cattle or pack animals have been present, we recommend that drinking water be treated. In Sierra Nevada wilderness areas, water from alpine sidestreams that are free from upstream domesticated animal use have a very low risk of harboring coliforms and we believe have a minimal risk of illness if drunk untreated." (Derlet and others 2008).

Your HARM Plan should evaluate and disclose the effects of domestic animal wastes on the environment, and adopt mandatory measures to mitigate the harmful effects. For example, stock users should be required to use diapers on pack and saddle stock animals to prevent pollution of surface waters by livestock manure and urine. Horse diapers that capture both manure and urine are commercially available and have been accepted around the world. See, for example: http://www.equisan.com.au/

In addition, your environmental document must acknowledge not only the State of California's specific water quality standards, but also the state/federal anti-degradation requirements. See the *Water Quality Control Plan for the Central Valley Region*, the State Water Resource Control Board's Resolution No. 68-16 ("Statement of Policy with Respect to Maintaining High Quality Waters in California"), and 40 CFR Sec 131.12. The Park Service cannot allow high-elevation waters in Yosemite to be continually polluted by domestic stock animals without at least making the anti-degradation findings required by the federal Clean Water Act and the State of California's Porter-Cologne Water Quality Act.

Significantly, the waters of Yosemite National Park are high quality waters that are eligible for designation as Outstanding National Resource Waters. The federal and State anti-degradation

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requirements clearly apply. Specifically, the National Park Service must comply with the California State Water Board's Resolution No. 68-16, which requires that existing high quality waters be fully protected, unless very specific formal findings are made. In this case, neither the Central Valley Regional Water Quality Control Board, the California State Water Resources Control Board, nor the U.S. Environmental Protection Agency has ever made the overriding findings necessary to allow degradation of water quality from the High Sierra Camps or the commercial stock enterprises that operate throughout the Yosemite high country. Because the degradation and pollution of water resulting from both the High Sierra Camps and the commercial packtrains are feasibly *controllable,* that degradation and pollution must be fully prevented (unless the findings required by Res. 68-16 are formally made). These violations of state and federal water quality laws must be stopped.

Impacts due to invasive weeds

The role of herbivores in dispersing weeds is well established. Seeds can be spread from one location to another by attachment to the bodies of animals (epizoochory) or by being ingested and later excreted (endozoochory). (See, for example, Fenner 1985, Hammit and Cole 1987, Harmon and Kiem 1934, Heady 1954, Janzen 1982, Ridley 1930.) Many native herbivores have been shown to be effective seed dispersers. In addition, domestic stock animals such as cattle, sheep, pigs, and horses have all been shown to pass viable seeds through their intestinal tracts. (See, for example, Harmon and Kiem 1934, Harper 1977, Heady 1954, Janzen 1981 and 1982, McCully 1951, Piggin 1978, St John-Sweeting and Morris 1991, Welch 1985.) A detailed review of the scientific literature regarding the spread of weeds by domestic livestock (cattle, sheep, and horses) concluded:

> "Recent research showing that livestock significantly increase invasions by nonindigenous plants in the western U.S. is persuasive. Similar results were found in all western states and for nearly every introduced species that has been studied. Although many of these studies would have benefited from both better replication and more recent research techniques, the pattern of evidence is overwhelming." (Belsky and Gelbard 2000)

Numerous other reports document specifically that recreation livestock (i.e., horses, mules, etc.) can and do spread exotic weeds. (See Benninger 1989, Benninger-Truax et al. 1992, Campbell and Gibson 2001, Hammit and Cole 1987, Harmon and Kiem 1934, Janzen 1981 and 1982, Landsberg et al. 2001, Quinn et al. 2006, Weaver and Adams 1996.) For example, several reports show that horses can excrete viable seeds for many days or even *weeks* after ingestion. (See, for example, Janzen 1981, and St John-Sweeting and Morris 1991.)

Hammit and Cole (1987) state that horse manure is a major source for exotic seeds in wilderness recreation areas. Campbell and Gibson (2001) found that *"seeds transported via horse dung can become established on trail systems,"* and that weed seeds found in horse manure had become established along trails used by horses, but not along trails that weren't used by horses. Weaver and Adams (1996) documented *"substantial overlap in the weed species germinated from horse*

manure and the weeds present along trails used by horses." After reviewing all available scientific evidence, Landsberg et al. (2001) concluded that: *"concerns about dispersal of weeds by horses are legitimate."*

Invasive (i.e., weed) species have been specifically identified—at the national level—as one of the **four greatest threats** to our national forests:

See: http://www.fs.fed.us/projects/four-threats/

The spread of invasive weeds has also been identified by the Regional Forester as an urgent issue that needs to be addressed throughout California.

See: http://www.fs.fed.us/r5/noxiousweeds/
As outlined above, scientists have documented "overwhelming" evidence that domestic livestock (including horses, mules, etc.) can and do spread harmful weeds. Although adjacent national forests (such as the Toiyabe National Forest) now **require** the use of weed-free feed by recreation livestock, this issue has never been adequately addressed by the Park Service at Yosemite. Your HARM Plan should address the issues of weeds and plant pathogens that may be spread by domestic stock animals used throughout the Yosemite high country, and require definitive prevention measures.

This should include, at minimum, mandatory measures to mitigate the potential for spread of weeds and plant pathogens, such as: (1) prohibiting all grazing by domestic stock (to minimize the free-roaming of stock animals and dispersion of seeds across the landscape via epizoochory and endozoochory); (2) requiring stock users to quarantine and feed their animals weed-free forage for at least several days before entering the park (in order for stock animals to excrete viable weed seeds before entering Yosemite); (3) effectively cleaning stock coats and hooves before entering the park (to minimize the potential for epizoochory); and (4) a monitoring and enforcement program to verify the implementation and effectiveness of the adopted measures.

Trail damage by stock animals

When compared to hikers, stock parties cause substantially greater impacts to trails (Dale and Weaver 1974, Frissell 1973, Kuss et al. 1986, Laing 1961, McQuaid-Cook 1978, Trottier and Scotter 1975, Weaver and Dale 1978, Weaver et al. 1979, Whitson 1974, Whittaker 1978, Wilson and Seney 1994). This is significant because damaged trails contribute to sedimentation of surface waters, affecting water quality and the biological integrity of streams and lakes.

Whitson (1974) provides a good discussion of how horse impact differs from hiker impact. Dale and Weaver (1974) observed that trails used by horses were deeper than trails used by hikers only. Trottier and Scotter (1975) documented deterioration of trails used by large horse parties.

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Weaver and Dale (1978) found that horses caused significantly greater trail damage than hikers. Whittaker (1978) concluded that horses significantly increased the potential for severe erosion by churning soil into dust or mud. Weaver et al. (1979) found that horses caused more trail wear than both hikers and motorcycles. After reviewing the available literature, Kuss et al. (1986) concluded that: *"Pack stock and horse travel is considerably more damaging to trails than hiking."* Recent research (Wilson and Seney 1994) has confirmed these earlier studies, concluding that *"horses produced significantly larger quantities of sediment compared to hikers, off-road bicycles, and motorcycles."*

Aesthetic effects (adverse impacts on visitors' experience)

We are also very concerned about the many aesthetic impacts that result from stock use, such as the dust, manure, urine, and flies that severely pollute many trails in the Yosemite high country (see Absher 1979, Cole 1990, Stankey 1973, Watson et al. 1993, and the many public comments in the record for this project and the concurrent Vogelsang utilities construction proposal). The experience of park visitors will continue to be substantially harmed until the numerous commercial pack trains that travel throughout the Yosemite high country are substantially reduced.

The State of California has designated the waters of the Yosemite high country for beneficial uses including "Contact Recreation" and "Non-Contact Recreation." Those beneficial uses of water are harmed by: (1) the discharge of pathogens in stock manure and pollution from the High Sierra Camps; (2) impacts to color and taste/odor from the discharge of stock manure and urine directly into surface waters; and (3) runoff of other controllable pollutants (nutrients, salts, etc.) from the High Sierra Camps and livestock wastes into surface waters, including wetlands.

Alternatives to be Considered in the HARM Plan

As discussed above, your HARM Plan should include the following:

1. Elimination of the High Sierra Camps. The time has come to remove these offensive and polluting developments in the Yosemite high country.

2. No Grazing. Stock use would be allowed to continue but stock users must keep animals tied up when not in use, and provide weed-free feed, as required in many other national parks. (A second alternative might consider allowing limited grazing for essential administrative purposes—such as pack animals used by rangers to remove trash from the high country—but only after a "minimum tool" analysis has been carefully completed with opportunity for public comment.)

3. Limits on the number of allowable stock days. Some impacts of stock animals, such as trail erosion, cannot be feasibly mitigated and must be controlled with limits on the amount of use.

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4. Diapers on all stock animals, and mandatory guidance for proper disposal of livestock manure and urine. Diapers for livestock are commercially available and accepted throughout the world. It is time for Yosemite to catch up with the times.

5. Mandatory measures to prevent the spread of weeds (including effective cleaning of livestock coats/hooves to prevent epizoochory, effective quarantine and conditioning of animals to prevent endozoochory, and a monitoring and enforcement program to verify implementation and effectiveness of the mitigation measures).

Summary and Conclusions

As discussed above, the High Sierra Camps and excessive livestock use in the Yosemite high country are having significant, adverse impacts on the aquatic environment and wilderness character of Yosemite. The elitist, polluting High Sierra Camps should be closed and the sites restored. Period.

Any alternative that allows livestock use in the Yosemite high country must address the many significant impacts caused by livestock, including but not limited to: (1) water pollution by stock manure and urine, and from sediment detached by stock trampling; (2) harm to sensitive aquatic species (such as the Yosemite toad, mountain yellow-legged frog, and others) and their critical habitats (including terrestrial habitats used by aquatic species); (3) physical trampling of sensitive wetlands, lakeshores and other aquatic habitats; (4) physical destruction (i.e., trampling) and consumption of vegetation; (5) changes in stream/meadow hydrology (including disturbances that prevent or delay the healing of past impacts); (6) spread of invasive weeds; and (7) conflicts with park visitors (i.e., impacts to state-adopted beneficial uses of water for recreation; violation of state-adopted standards for pathogens, color, "taste/odor"; etc.).

Thank you for considering these comments. Please contact us at the above address if you have any questions about this letter. Please also send full paper copies of all environmental and decision documents for our review.

Sincerely yours,

Peter Browning

Peter Browning

REFERENCES

Absher, J., and E. Absher. 1979. Sierra club wilderness outing participants and their effect on Sierra Nevada wilderness users. pp. 31-60, In: J.T. Stanley et al. (eds.) *A Report On the Wilderness Impact Study*. Sierra Club, Palo Alto, CA.

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p. 12 of 20

Airola, D.A. 1986. Brown-headed cowbird parasitism and habitat disturbance in the Sierra Nevada. *J Wildlife Manage* 50(4):571-575.

Ames, C.R. 1977. Wildlife conflicts in riparian management: Grazing. pp. 49-52. In: Johnson, R.R. and D.A. Jones. Importance, Preservation and Management of Riparian Habitats. USDA Forest Service, Gen. Tech. Rpt. RM-43. Rocky Mtn. Forest & Range Experiment Station, Ft. Collins, CO.

Armour, C. 1979. Livestock management approaches and the fisheries resource. p. 39. In: Cope, O.B. (ed). Proc. of the Forum on Grazing and Riparian/Stream Ecosystems. 94 pp. Trout Unlimited, Inc. Denver, CO.

Behnke, R.J. and R.F. Raliegh. 1978. Grazing and the riparian zone: Impact and management perspectives. pp. 184-189. In: Johnson, R.D. and J.F. McCormick. Strategies for Protection and Management of Floodplain Wetlands and other Riparian Ecosystems. 410 pp. USDA Forest Service Gen. Tech. Rpt. WO-12. Wash., D.C.

Belsky, A.J., and J.L. Gelbard. 2000. Livestock Grazing and Weed Invasions in the Arid West. A scientific report published by the Oregon Natural Desert Association. Bend, Oregon.

Bemrick, W.J. 1968. *Giardia* in North American horses. *Vet Med/SAC* 63:163-165.

Benninger, M.C. 1989. Trail corridors as conduits of movement for plant species in coniferous forests of Rocky Mountain National Park, Colorado. M.S. Thesis, Miami University.

Benninger-Truax, M.C., Vankat, J.L., and R.L. Schaefer. 1992. Trail corridors as habitat and conduits for movement of plant species in Rocky Mountain National Park, Colorado, USA. *Landscape Ecology*. 6: 269-278.

Blaser, M.J., D.N. Taylor and R.A. Feldman. 1984. Epidemiology of *Campylobacter* infections. In: Butzler, J.P. (ed.) *Campylobacter Infection in Man and Animals.* pp. 143-161. CRC Press, Inc. Boca Raton, FL.

Bohn, C.C. and J.C. Buckhouse. 1985. Some responses of riparian soils to grazing management in northeastern Oregon. *J Range Manage* 38:378-381.

Buret, A., N. denHollander, P.M. Wallis, et al. 1990. Zoonotic potential of giardiasis in domestic ruminants. *J Inf Dis* 162:231-237.

Butzler, J.P. 1984. Introduction, In: Butzler, J.P. (ed.) *Campylobacter Infection in Man and Animals.* CRC Press, Inc. Boca Raton, FL.

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p.13 of 20

Campbell, J.E., and D.J. Gibson. 2001. The effect of seeds of exotic species transported via horse dung on vegetation along trail corridors. *Plant Ecology*. 157: 23-35.

Capon, A.G., J.A. Upcroft, P.F.L. Boreham, L.E. Cottis, and P.G. Bundesen. 1989. Similarities of giardia antigens derived from human and animal sources. *International Journal for Parasitology* 19(1):91-98.

Cole, D.N. 1977. Man's impact on wilderness vegetation: an example from the Eagle Cap Wilderness, northeastern Oregon. Ph.D. diss. Univ. Oregon, Eugene. 307 pp.

Cole, D.N. 1989. Low-impact recreational practices for wilderness and backcountry. USDA Forest Service, Intermountain Research Station, Gen. Tech. Rpt. INT-265. Ogden, UT.

Cole, D.N. 1990. Ecological impacts of wilderness recreation and their management. pp. 425-462, In: Hendee, J.C., et al. (eds.) *Wilderness Management.* Second edition. North American Press, Golden, CO.

Dale, D., and T. Weaver. 1974. Trampling effects on vegetation of the trail corridors of north Rocky Mountain forests. *J Appl Ecol* 11:767-772.

Davies, R.B. and C.P. Hibler. 1979. Animal reservoirs and cross-species transmission of *Giardia.* pp. 104-126. In: *Waterborne Transmission of Giardiasis.* U.S. Environmental Protection Agency (EPA-600/9-79-001), Cincinnati, OH.

Davis, G.A. 1977. Management alternatives for the riparian habitat in the Southwest. pp. 59-67. In: Johnson, R.R. and D.A. Jones. Importance, Preservation and Management of Riparian Habitats, USDA Forest Service Gen. Tech. Rpt. RM-43. 217 pp. Rocky Mtn. Forest & Range Experiment Sta., Fort Collins, CO.

Derlet, R.W., and J.R. Carlson. 2002. An Analysis of Human Pathogens Found in Horse/Mule Manure Along the John Muir Trail in Kings Canyon and Sequoia and Yosemite National Parks. *Wilderness and Environmental Medicine* 13:113-118.

Derlet, R.W., and J.R. Carlson. 2006. Coliform Bacteria in Sierra Nevada Wilderness Lakes and Streams: What Is the Impact of Backpackers, Pack Animals, and Cattle? *Wilderness and Environmental Medicine* 17:15-20.

Derlet, R.W., K. Ali Ger, J.R. Richards, and J.R. Carlson. 2008. Risk Factors for Coliform Bacteria in Backcountry Lakes and Streams in the Sierra Nevada Mountains: A 5-Year Study. *Wilderness and Environmental Medicine* 19:82-90.

ARM-S-47
p. 14 of 20

Duff, D.A. 1979. Riparian habitat recovery on Big Creek, Rich County, UT. p. 91. In: Cope, O.B. (ed). Proc. of the Forum on Grazing and Riparian/Stream Ecosystems. 94 pp. Trout Unlimited, Inc. Denver, CO.

Faubert, G.M. 1988. Evidence that giardiasis is a zoonosis. *Parasitology Today* 4(3):66-68.

Fenner, M. 1985. Seed ecology. Chapman & Hall, London.

Fleischer, R.C., A.P. Smith and S.I. Rothstein. 1987. Temporal and age-related variation in the laying rate of the parasitic brown-headed cowbird in the eastern Sierra Nevada, California. *Can J Zool* 65:2724-2730.

Frissell, S.S. 1973. The impact of wilderness visitors on natural ecosystems. Unpubl. rep., USDA Forest Service, Forest Science Laboratory, Missoula, MT. 60 pp.

Graber, D.M. 1996. Status of Terrestrial Vertebrates. pp. 709-734, *In:* Sierra Nevada Ecosystem Project: Final report to Congress, vol. II, Assessments and scientific basis for management options. University of California, Davis, Centers for Water and Wildland Resources, 1996.

Hammit, W.E., and D.N. Cole. 1987. Wildland Recreation: Ecology and management. John Wiley & Sons, New York.

Harmon, G.W., and F.D. Kiem. 1934. The percentage and viability of weed seeds recovered in the feces of farm animals and their longevity when buried in manure. *J. Am. Soc. Agron.* 26: 762-767.

Harper, J.L. 1977. Population biology of plants. Academic Press, London.

Heady, H.F. 1954. Viable seed recovered from fecal pellets of sheep and deer. *Journal of Range Management.* 7: 259-261.

Hendee, J.C., G.H. Stankey, and R.C. Lucas. 1990. *Wilderness Management.* Second edition. International Wilderness Leadership Foundation in cooperation with the USDA Forest Service. North American Press, Golden, CO.

Isaac-Renton, J.L., C. Cordeiro, C. Sarafis, and H. Shahriari. 1993. Characterization of giardia duodenalis isolates from a waterborne outbreak. *Journal of Infectious Diseases* 167:431-440.

Janzen, D.H. 1981. *Enterlobium cyclocarpun* seed passage rate and survival in horses, Costa Rican pleistocene seed dispersal agents. *Ecology.* 62: 593-601.

Janzen, D.H. 1982. Differential seed survival and passage rates in cows and horses. *Oikos.* 38: 150-156.

ARM-S-47
p.15 of 20

Johnson, P.T.J., and others. 2007. Aquatic eutrophication promotes pathogenic infection in amphibians. *Proceedings of the National Academy of Sciences*, 104(40):15781-15786.

Kasprzak, W., and Z. Pawlowski. 1989. Zoonotic aspects of giardiasis: a review. *Vet Parasitol* 32:101-108.

Kauffman, J.B., W.C. Krueger, and M. Vaura. 1983. Impacts of cattle on streambanks in northeastern Oregon. *J Range Manage* 36:683-685.

Kauffman, J.B., and W.C. Krueger. 1984. Livestock impacts on riparian ecosystems and streamside management implications. *J Range Manage* 37:430-438.

Kirkpatrick, C.E. 1989. Giardiasis in large animals. *Compend Contin Educ Pract Vet* 11:80-84.

Kirkpatrick, C.E., and D.L. Skand. 1985. Giardiasis in a horse. *JAVMA* 187:163-164.

Knudson, T. 1991. Roads, cattle damage Sierra: Logging, grazing cause soil erosion, watershed problems. *Oakland Tribune.* 15 December 1991.

Kuss, F.R., A.R. Graefe, and L. Loomis. 1986. Plant and soil responses to wilderness recreation: a synthesis of previous research. pp. 129-137, In: Lucas, R.C. (compiler) *ProceedingsCNational Wilderness Research Conference: Current Research.* USDA Forest Service, Intermountain Research Station, Ogden UT. General Technical Report INT-212.

Laing, C.C. 1961. A report on the effect of visitors on the natural landscape in the vicinity of Lake Solitude, Grand Teton National Park, Wyoming. Unpubl. rep. USDI National Park Service, Grand Teton National Park. 62 pp.

Landsberg, J., B. Logan, and D. Shorthouse. 2001. Horse riding in urban conservation areas: Reviewing scientific evidence to guide management. *Ecological Management & Restoration.* 2(1): 36-46.

LeChevallier, M.W., W.D. Norton, and R.G. Lee. 1991. *Appl Environ Microbiol* 57:2610-2616.

Manahan, F.F. 1970. Diarrhoea in horses with particular reference to a chronic diarrhoea syndrome. *Aust Vet J* 46:231-234.

Manser, P.A., and R.W. Dalziel. 1985. A survey of *Campylobacter* in animals. *J Hyg (Camb)* 95:15-21.

ARM-S-47
p. 16 of 20

Marlow, C.B., and T.M. Pogacnik. 1985. Time of grazing and cattle-induced damage to streambanks. pp. 279-284. In: Johnson, R.R., Riparian Ecosystems and their Management: Reconciling Conflicting Uses. First North American Riparian Conf. USDA Forest Service. Gen. Tech. Rpt. RM-120. 523 pp. Rocky Mtn. Forest & Range Exp. Sta., Fort Collins, CO.

McCully, W.G. 1951. Recovery and viability of Macartney rose seeds fed to cattle. *Journal of Range Management*. 4: 101-106.

McQuaid-Cook, J. 1978. Effects of hikers and horses on mountain trails. *J Envir Mgm* 6:209-212.

Meecham, W.R., and W.S. Platts. 1978. Livestock grazing and the aquatic environment. *J Soil & Water Conser* 33(6):274-278.

Merkle, J. 1963. Ecological studies of the Amphitheater and Surprise Lakes cirque in the Teton Mountains, Wyoming. Unpubl. rep., National Park Service, Grand Teton National Park, 25 pp.

Meyer, E.A. 1988. Waterborne *Giardia* and *Cryptosporidium*. *Parasitology Today* 4(7):200-201.

Miller, T.C. East Bay water quality threat? *The Daily Californian.* 16 December 1991.

Mosconi, S.L., and R.L. Hutto. 1982. The effect of grazing on the land birds of a western Montana riparian habitat. pp. 221-233. In: Peek, J.M., and P.D. Dalke (eds). Wildlife-Livestock Relationships Symposium. Proc. 10. 614 pp. Univ. of Idaho. Forest, Wildlife and Range Exp. Sta., Moscow, ID.

Nagy, J.A.S., and G.W. Scotter. 1974. A quantitative assessment of the effects of human and horse trampling on natural areas. Waterton Lake National Park. Unpubl. rep., Canadian Wildlife Service, Edmonton, Alberta. 145 p.

Neuman, M.J. 1990. Past and present conditions of backcountry meadows in Sequoia and Kings Canyon National Parks. Second edition. Unpubl. rep., USDI National Park Service, Sequoia & Kings Canyon NP's, Three Rivers, CA. 21 December 1990.

Neuman, M.J. 1991a. Accomplishments of the stock use and meadow monitoring program in 1990. Unpubl. rep., USDI National Park Service, Sequoia & Kings Canyon NP's, Three Rivers, CA. 18 January 1991.

Neuman, M.J. 1991b. 1991 Accomplishments of the stock use and meadow monitoring program. Unpubl. rep., USDI National Park Service, Sequoia & Kings Canyon NP's, Three Rivers, CA. 1 November 1991.

Piggin, C.M. 1978. Dispersal of *Echium plantagineum* L. by sheep. *Weed Res.* 18: 155-160.

Platts, W.S. 1979. Livestock grazing and riparian/stream ecosystems. pp. 39-45. In: Cope, O.B. (ed). Proc. of the Forum on Grazing and Riparian/Stream Ecosystems. 94 pp. Trout Unlimited, Inc. Denver, CO.

Platts, W.S. 1981. Effects of sheep grazing on a riparian-stream environment. USDA Forest Service Research Note INT-307. Intermountain Forest & Range Exp. Sta., Ogden, UT.

Platts, W.S., and F.J. Wagstaff. 1984. Fencing to control livestock grazing on riparian habitats along streams: Is it a viable alternative? *NAJMDP* 4:266-272.

Quinn, L., M. Kolipinski, and S. Ghosh. 2006. Horses as vectors for weed invasion in California=s National Parks: The promise of weed-free feed. Presented at: 59th Annual Meeting of the Western Society of Weed Science, March 14-16, 2006. Reno, NV.

Ridley, H.N. 1930. Dispersal of Plants Throughout the World. Reeve, Ashford, UK.

Rosquist, A. 1984. *Giardia* source investigation in Rattlesnake Creek, July 5 - October 31, 1983. Unpubl. memo. Lolo National Forest, Missoula, MT.

Rothstein, S.I., J. Verner, and E. Stevens. 1980. Range expansion and diurnal changes in dispersion of the brown-headed cowbird in the Sierra Nevada. *Auk* 97:253-267.

Rush, B.A., P.A. Chapman, and R.W. Ineson. 1987. *Lancet* 2:632-633.

Saeed, A.M., N.V. Harris, and R.F. DiGiacomo. 1993. The role of exposure to animals in the etiology of campylobacter jejuni/coli enteritis. *American J of Epidemiology* 137(1):108-114.

Siekert, R.E., Q.D. Skinner, M.A. Smith, J.L. Doad, and J.D. Rodgers. 1985. Channel response of an ephemeral stream in Wyoming to selected grazing treatments. pp. 276-278. In: Johnson, R.R. Riparian Ecosystems and their Management: Reconciling Conflicting Uses. First North American Riparian Conf. USDA Forest Service Gen. Tech. Rpt. RM-120. 523 pp. Rocky Mtn. Forest & Range Exp. Sta., Fort Collins, CO.

St. Jean, G., Y. Couture, P. Dubreuil, and J.L. Frechette. 1987. Diagnosis of *Giardia* infection in 14 calves. *JAVMA* 191(7):831-832.

St John-Sweeting, R.S., and K.A. Morris. 1991. Seed transmission through the digestive tract of the horse. *In:* Plant InvasionsCThe Incidence of Environmental Weeds in Australia. pp. 170B172. Kowari 2, Australian National Parks and Wildlife Service, Canberra.

ARM-S-47
p. 18 of 20

Stankey, G.H. 1973. Visitor perception of wilderness recreation carrying capacity. Res. Pap. INT-142. USDA Forest Service, Intermountain Forest And Range Experiment Station, Ogden UT. 61 pp.

Stanley, J.T., H.T. Harvey, and R.J. Hartesveldt (eds.). 1979. *A Report On the Wilderness Impact Study.* Sierra Club, Palo Alto, CA. pp. 17, 201-202.

Strand, S. 1972. An investigation of the relationship of pack stock to some aspects of meadow ecology for seven meadows in Kings Canyon National Park. M.A. thesis. Calif. State Univ., San Jose. 125 pp.

Strand, S. 1979a. The impact of stock on wilderness meadows in Sequoia and Kings Canyon National Parks. pp. 77-87. In: Stanley, J.T. et al. (eds.), *A Report On the Wilderness Impact Study.* Sierra Club, Palo Alto, CA.

Strand, S. 1979b. Recovery of Sierran meadows after trampling by pack stock. pp. 88-93. In: Stanley, J.T. et al. (eds.), *A Report On the Wilderness Impact Study.* Sierra Club, Palo Alto, CA.

Strand, S. 1979c. Pack stock management in the high Sierra. pp. 209. In: Stanley, J.T. et al. (eds.), *A Report On the Wilderness Impact Study.* Sierra Club, Palo Alto, CA.

Stranden, A.M., J. Eckert, and P. Kohler. 1990. Electrophoretic characterization of giardia isolated from humans, cattle, sheep, and a dog in Switzerland. *J Parasitol* 76(5):660-668.

Suk, T.J. 1983. Investigation of animal hosts for *Giardia* spp. in California's Sierra Nevada mountains. USDI National Park Serv., Coop. Park Studies Unit, Institute of Ecology, Univ. CA at Davis. Tech. Rpt. No. 11.

Suk, T.J., J.L. Riggs, and B.C. Nelson. 1986. Water contamination with *Giardia* in backcountry areas. In: Proc. of the National Wilderness Research Conf. Gen. Tech. Rpt. INT-212. USDA Forest Service Intermountain Research Sta., Ogden, UT.

Sumner, L., and R.M. Leonard. 1947. Protecting mountain meadows. *Sierra Club Bulletin* 32(5):53-69.

Taylor, D.N., K.T. McDermott, J.R. Little, J.G. Wells, M.J. Blaser. 1983. *Campylobacter* enteritis from untreated water in the Rocky Mountains. *Ann Intern Med* 99:38-40.

Taylor, D.M. 1986. Effects of cattle grazing on passerine birds nesting in riparian habitat. *J Range Manage* 39:254-258.

ARM-S-47
p. 19 of 20

Thomas, J.W., C. Maser, and J.E. Rodnick. 1979. Riparian zones in managed rangelands: their importance to wildlife. pp. 21-30. In: Cope, O.B. (ed). Proc. of the Forum on Grazing and Riparian/Stream Ecosystems. 94 pp. Trout Unlimited, Inc., Denver, CO.

Trottier, G.C., and G.W. Scotter. 1975. Backcountry management studies, the Egypt Block, Banff National Park. Unpubl. rep., Canadian Wildlife Service, Edmonton, Alberta. 178 pp.

Upcroft, J.A., and P. Upcroft. 1994. Two distinct varieties of giardia in a mixed infection from a single patient. *J Euk Microbiol* 41(3):189-194.

Verner, J. and L.V. Ritter. 1983. Current status of the brown-headed cowbird in the Sierra National Forest. *Auk* 100:355-368.

Watson, A., M.J. Niccolucci, and D.R. Williams. 1993. Hikers and recreational stock users: predicting and managing recreation conflicts in three wildernesses. Research Paper INT-468. USDA Forest Service, Intermountain Research Station. Ogden, UT.

Weaver, V., and R. Adams. 1996. Horses as vectors in the dispersal of weeds into native vegetation. Proceedings of the Eleventh Australian Weeds Conference. pp. 383-397.

Weaver, T., and D. Dale. 1978. Trampling effects of hikers, motorcycles and horses in meadows and forests. *J Appl Ecol* 15:451-457.

Weaver, T., D. Dale, and E. Hartley. 1979. The relationship of trail condition to use, vegetation, user, slope, season and time. pp. 94-100, *In:* Ittner, R., et al. (eds.), *Recreational Impact on Wildlands* conference proceedings, Oct. 27-29, 1978, USDA Forest Service, Pacific Northwest Region, R-6-001-1979.

Welch, D. 1985. Studies in the grazing of heather moorland in northeast Scotland; IV. Seed dispersal and plant establishment in dung. *Journal of Applied Ecology*. 22: 461-472.

Weniger, B.G., et al. *Am J Public Health* 73:868-872.

Whitson, P.D. 1974. The impact of human use upon the Chisos Basin and adjacent lands. USDI National Park Service Science Monograph Series 4. Gov. Print. Office, Washington, D.C. 92 pp.

Whittaker, P.L. 1978. Comparison of surface impact by hiking and horseback riding in the Great Smoky Mountains National Park. Manage. Rep. 24. USDI National Park Service, Southeast Region. 32 pp.

Wilson, J.P., and J.P Seney. 1994. Erosional impact of hikers, horses, motorcycles, and off-road bicycles on mountain trails in Montana. Mountain Research and Development 14(1):77-88.

ARM-S-47
p. 20 of 20

Winegar, H.H. 1977. Camp Creek channel fencing: plant, wildlife, and soil and water response. *Rangeman's Journal* 4:10-12.

Xiao, L., R.P. Herd, and D.M. Rings. 1993. *Vet Parasitol* 51:41-48.

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