René Voss – Attorney at Law
15 Alderney Road
San Anselmo, CA 94960
Tel: 415-446-9027
renepvoss@gmail.com

January 30, 2012

Sent to:
mariannethomas@fs.fed.us

Anne Thomas
Western Divide Ranger District
32588 Highway 190
Springville, CA93265

cc: Ara Marderosian
Georgette Theotig
Rich Kangas

Subject: Long Meadow Restoration Project Scoping Comments for Sequoia ForestKeeper & Kern-Kaweah Chapter of the Sierra Club

Sequoia ForestKeeper (SFK) and the Kern-Kaweah Chapter of the Sierra Club (the Club) thank you for the opportunity to comment.

BACKGROUND

The December 30, 2011 scoping notice provides the following "Desired Condition" and "Purpose and Need" for the Long Meadow Restoration Project:

> **Desired Condition**
> The stream channel properly functions hydrologically and accesses the full extent of its floodplain. The water table within the meadow has returned to a level similar to pre-headcut conditions. Late seral vegetation (moist) species are reestablished. Conifer establishment into the meadow has stopped and existing conifers have died due to saturated root systems. With natural hydrologic connectivity, aquatic organisms are able to move within the meadow. Natural streambank erosion and sediment delivery to downstream resources is at a natural background rate (0.1 - 0.4 cubic yards per year). Conditions that favor active headcuts are not present.
>
> * * *
>
> Purpose and Need
> The purpose of the Long Meadow Restoration Project is to move toward, or achieve, the desired condition of returning the stream channel to its proper hydrological function while decreasing erosion and sedimentation.
>
> There is a need for reduced sedimentation back to natural levels (approximately 0.1 - 0.4 cubic yards per year) and for restoring Long Meadow's hydrologic function and connectivity to its floodplain and sustain diverse habitats.

Scoping Notice, pp. 2, 3.

To achieve these outcomes, the Forest Service proposes to install plug structures and associated ponds, along with other actions, such as a valley grade control structure, planting vegetation, and installation of a temporary fence.

The water table should not be raised too much

One point in the "Desired Condition" is very important, that the "water table within the meadow has returned to a level similar to pre-headcut conditions." This means that the meadow topography should not be changed so much that the water level rises higher than that which existed naturally. For example, the ponds and plugs at Big Meadows changed meadow topography significantly. The ponds, which did not exist before, now raise water levels significantly above pre-headcut levels, which results in the meadow being flooded much of the year. Moreover, water flow is not a natural sheet flow. Rather, the water that backs up behind the plugs is forced to flow out over other vegetated meadow surfaces. *See* Figure 1 (below).

What this means is that the pond and plug technique can result in conditions that are not compatible with the desired condition to return the water table in the meadow to a level similar to pre-headcut conditions. *See also* Figure 2 – Healthy Meadow Illustration (below).

Figure 1. - Big Meadows post project - Spring, 2008 (streamflow is left to right). Photo by: Wayne Luallen (source: TECHNICAL REPORT #1, January, 22, 2010)

Sierra Club Resolution on Meadow Restoration in the Sierra Nevada Mountains

At its October 17-18, 2009 meeting, the Sierra Club passed the following resolution:

> The California/Nevada Regional Conservation Committee of the Sierra Club favors ecologically appropriate restoration, rehabilitation, or reclamation projects that can help to heal severely degraded Sierra Nevada meadows. Meadow restoration projects should consistently provide:
>
> 1. Baseline studies to determine the nature of each such meadow and its needs for correction;
> 2. Project design and environmental documentation (consistent with applicable law) that are appropriate for the needed corrections; and
> 3. Project-specific monitoring conducted after project completion to assess the efficacy and stability of the treatments over time.
>
> Whatever treatment method is determined by an agency's scientific analysis to be most beneficial for restoring a meadow's condition, such treatment should not pose new, significant risks that could cause damage greater than the existing degradation. As soon as possible, the U.S. Forest Service, the National Park Service, and other cooperating land management agencies should jointly compile the best available scientific information concerning meadow restoration treatments and techniques so that the design of individual projects can be based upon that best available science and proven successes

Just as there are various ways that meadows form, there are various ways that meadows become degraded and gullied. Most degradation has occurred as a result of overgrazing and trampling by livestock. In the mid-1800's degradation occurred from sheep; since then cattle have caused the degradation. Evidence of degradation goes beyond the gullies to also include changed vegetation, altered hydrology, and poor water quality. Livestock ate away certain meadow plants. Livestock gathered near shallow, steep-sided water courses in those meadows and trampled the banks and meadow surfaces. Ultimately deep gullies (incised streams) formed. These deep gullies allow water to rush off the meadows rather than follow old meander courses and soak in. As a consequence, depths to water tables in meadows have increased resulting in drier surface conditions and further altered meadow vegetation.

Over the years, there have been many modest attempts at collecting sediments in those gullies by placing trees and other vegetation in the gullies or by building small check dams. Slow progress was made as sediments accumulate slowly. Meanwhile, cattle (or other livestock) still grazing in the meadows continue to trample the stream banks and counteract the effects of those meadow restoration attempts. Recently, there has been a trend to boldly speed up the process. Federal agencies have been doing this through the use of heavy equipment to either fill incised streams with sediment, or to block them with a series of "ponds and plugs."

There is a big push to use mechanized methods in the next 10 years to fix ALL severely degraded Sierra Nevada meadows and improve cattle grazing. The National Fish and Wildlife

Foundation (NFWF) made such a proposal in its March 2009 Draft Business Plan (Google search: "nfwf, meadow restoration"). In that Business Plan, NFWF states that meadow restoration is generally expected to raise groundwater levels so that meadows remain wetter through more of the dry summer season and so that "base flows" from the meadows continue through more of the summer and fall. With wetter conditions, meadow vegetation should grow better. This proposal calls for developing scientific consensus for their methods and goals in the first five years of their project. By 2014 work would be completed on 60,000 acres of meadows *selectively chosen* for a "high likelihood of success." By the nature of science, the goal to *selectively* develop such consensus in such a short time is overly ambitious and likely not legitimate. Such a huge acreage of pilot projects not based on science is very risky. The Draft Business Plan purports that once scientific consensus is reached in 2014, meadow restoration throughout the Sierra Nevada (an additional 180,000 acres) would be completed in the second five years. The cost is estimated at $210 million. The only methodology mentioned in the Draft Business Plan is "pond and plug". Pond and plug methodology is rehabilitation or reclamation, not restoration. With "pond and plug," excavations inside a meadow (ponds or pits created by heavy equipment) provide the source of fill material for the plugs (berms and other barriers made by heavy equipment) placed within gullies and across the meadow surfaces to impound and back up water. Such work alters meadows and thus is not restoration.

At Big Meadows in the Giant Sequoia National Monument, the Forest Service, following a student thesis and with further engineering design, completed a pond and plug project in 2007. Large unnatural bodies of water and piles of sediment moved from excavations in the meadow surface are now the dominant features in the project area in Big Meadows, an object of interest in the Giant Sequoia National Monument. The Antiquities Act requires protection of such objects of interest. We can support restoration of naturally functioning ecosystems in meadows, but the pond and plug project at Big Meadows did not do that. Pond and plug might provide restoration in other settings where it might not lead to changes in meadow topography, but at Big Meadows the topography is now dramatically changed.

At Upper Halstead Meadow along the Generals Highway, Sequoia National Park has carried out meadow restoration by a different method. After several years of onsite studies, a restoration concept was developed to account for the unique characteristics at Upper Halstead Meadow. Appropriate fill material was then trucked in and the entire gully was filled, thus bringing the incised stream back to grade so that sheet flow of water spreads over the meadow once again. This has restored Upper Halstead Meadow to a condition in which vegetation is being reestablished. Once sod develops, pre-grazing conditions can resume.

Proper meadow restoration should be planned so the restoration method chosen for corrective action will not lead to further meadow destruction, including significant changes in meadow topography. Each meadow is unique. The chosen restoration method (whether filling an incised gully, or pond and plug, or some other method) should be unique and appropriate to that particular meadow. Long-term post-project monitoring, while keeping livestock off the meadow, should provide data to measure the success of all expected outcomes.

COMMENTS

1. **<u>An EA or EIS should be prepared to consider at least one additional alternative.</u>**

The Forest Service should fully analyze an alternative that implements a Halstead Meadow type restoration technique of the Long Meadow, which is a reasonable and feasible alternative to the proposed action.

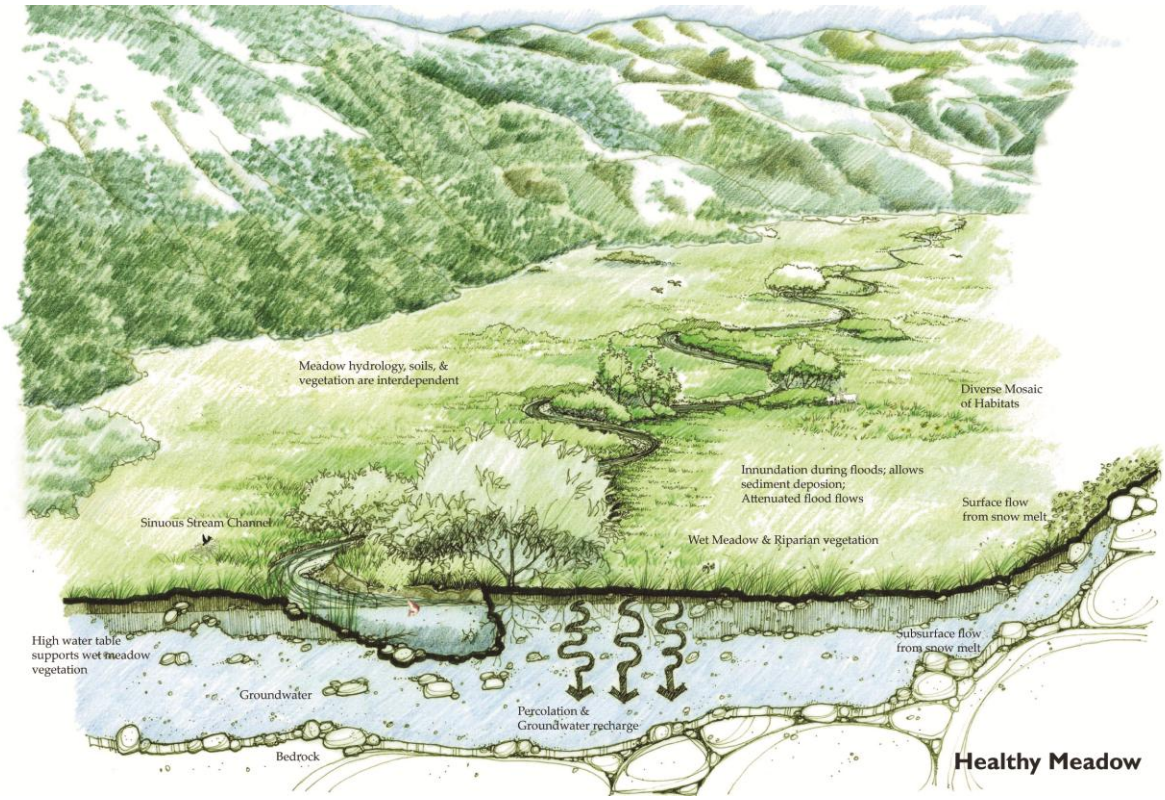

Figure 2. – Illustration of Healthy Meadow System. Naturally meandering creeks support native fish, riparian cover including willow and alder thickets, lush wetland vegetation, healthy soil and high levels of infiltration into groundwater which subsequently recharges streams during drier months and creates rich biological diversity for meadow dependant species (source: Sierra Nevada Meadow Restoration Business Plan, March 5, 2010).

<u>Description of Alternative</u>

SFK and SC would like the Forest Service to consider an alternative to the pond and plug technique and develop an EA or EIS that includes this alternative, similar to the restoration project implemented by the National Park Service for Halstead Meadow in the Sequoia National Park. That project also restored an incised meadow with a technique that does not create artificial ponds and plug but filled the incision with locally-derived soils and other materials, thereby restoring the original contour of the meadow.

The following link includes photographs of the Halstead Restoration work, done in 2009: http://picasaweb.google.com/renepvoss/HalsteadMeadowRestoration# .

In August of 2010, I visited the site and here are photographs of the restoration from that point in time: http://picasaweb.google.com/renepvoss/HalsteadMeadowAugust42010# .

The Halstead restoration technique appears to have worked to achieve the same outcomes as those described in the Long Meadow Restoration Project scoping notice under "Desired Conditions" and "Purpose and Need." Therefore, it should be considered a reasonable alternative and should be fully analyzed in an EA or EIS. The result will be a healthy meadow in a natural condition (see illustration on previous page).

The Halstead Meadow Restoration project is analyzed and described in the attached report by Cooper & Wolf, which could be used as a guide for such an alternative. *See* Exhibit A - Sequoia Nat. Park Cooper & Wolf Halstead Meadow Final Report March 2006 (attached).

The hydrologic restoration goal, similar to that for Halstead Meadow, should be to reestablish the sheet flow of water through the meadow that can maintain a water table near the soil surface for most of the summer across the entire meadow. The vegetation goals should be establishment of a complete cover of *Scirpus microcarpus, Oxypolis occidentalis* and *Glyceria elata* or other similar native vegetation found in Long Meadow. *See id.* at 15.

To restore the sheet flow hydrologic system, similar to that for Halstead meadow, we suggest filling the entire gully with layers of mineral sediment, including rock, and creating a flat meadow surface, as occurs in all of the reference meadows perpendicular to the flow direction. Truck loads of material can be dumped into the channel once the stream flow is diverted out of the channel. A small bulldozer can spread and compact the sediments. The channel should be filled to a level that allows for some settling. Areas of the meadow that have been eroded may also require additional minor filling or grading to reestablish the lateral continuity across the meadow.

In addition, similar to that for Halstead Meadow, we suggest installing at least 12 logs perpendicular to the flow direction. The coarse woody debris will help dissipate flow energy and spread water evenly across the meadow, as occurs in all of the meadows studied in the attached report. In addition, netting should be used to stabilize the bare soil surface. Earthwork should occur in the fall when water tables are deepest, and flow in the gully is lowest. Once the gully is filled, surface water can be allowed to flow across the meadow.

Further descriptions of the design and implementation of the Halstead Meadow are found in Exhibit B – Restoration of geomorphic structure, hydrologic regime, and vegetation in Upper Halstead Meadow Report of February 2011 (attached).

Moreover, this February 2011 report includes monitoring results of the goals of this project. *See* Exhibit B at 13-23. The report concludes:

> The restoration of Upper Halstead Meadow has achieved its primary goal of establishing a sheet flow hydrologic regime and perennially saturated soils in the area of filled gully as well as the adjacent hydrologically impacted sections of the

> meadow. The geomorphic goal of creating level topography across the valley width was achieved, and almost immediately upon completion of the gully-fill geomorphic restoration, the water table rose to the surface and sheet flow occurred across the entire Upper Halstead Meadow.

Id. at 25. One unexpected finding was that plant growth was inhibited by soil that was too compacted after the restoration efforts, which should be taken into account in any type of restoration. *See id.* at 23-24.

Figure 3. Upstream view of Upper Halstead in 2005 (top) before restoration and 2008 (bottom) after restoration. The planted seedlings are visible in rows in the filled gully at right, while the formerly dry meadow and intact meadow vegetation dominate on the left. Note the dry meadow surface adjacent to the 2005 stream-filled gully, while the entire meadow width is covered in thin sheetflow in the 2008 photo following geomorphic and hydrologic restoration.

Moreover, "The project goals for the hydrologic regime have been met: well readings in restored Upper Halstead are within 1 standard deviation of the intact portions of Upper and Lower

Halstead Meadow as well as the 5 reference meadows. . . . The project goal of seedling survival greater than 75% was met during the first growing season, 2008." *Id.* at 27.

Because the techniques used for meadow restoration at Halstead Meadow will meet the desired conditions and purpose and need for the Long Meadow restoration project, they must be considered as an alternative to the pond and plug technique in the proposed action.

Project Bias in favor of Pond and Plug

The Forest Service has previously applied for funding for the Long Meadow Restoration Project from the Sierra Nevada Conservancy. *See* Exhibit C – Long Meadow Project Funding Proposal. While that proposal is mostly general in nature with goals we can support, it contains a bias toward the pond-and-plug technique: "The pre-planning and environmental review will lead to project implementation to establish a low gradient step pool system from the bottom of the meadow up to the headcut." *Id.* at PDF p. 4.

NEPA, however, requires that all reasonable and feasible alternatives be explored. SFK and Sierra Club favor exploration of a different technique, as describe above and as feasibly implemented at Upper Halstead Meadow in the Sequoia National Park. If the Forest Service only considers its current proposed technique, it would be in violation of NEPA.

2. Clean Water Act and Stream Alteration Permits.

The Long Meadow Project cannot be started until the Forest Service acquires a U.S. Army Corps of Engineers Section 404 Permit, Section 401 Permit from California Regional Water Quality Control Board, and a Streambed Alteration Agreement from California Department of Fish & Game.

3. Grazing should be permanently retired in Long Meadow.

Even though the scoping notice does not discuss cattle or other livestock grazing, which likely caused the degradation in Long Meadow in the first place, any project proposal should include a permanent retirement of grazing in Long Meadow so that the restoration effort will not be undone in the future.

4. The GSNM Proclamation Requires Meadow Protection.

In the GSNM Proclamation meadows are included as "objects of interest" that require protection. In addition, the Proclamation also states "Other paleontological resources are found in meadow sediments, which hold detailed records of the last 10 millennia of changing vegetation, fire regimes, and volcanism in the Sierra Nevada." 65 Fed. Reg. 24,095, 24,096 (April 25, 2000). Any project that disturbs these meadow sediments must include an analysis of how the project will protect this resource.

5. <u>Any project decision should provide an opportunity for an administrative appeal.</u>

The Appeals Reform Act gives interested persons who have commented on a proposed action a right to appeal any decision that implements a forest plan, whether or not that decision was categorically-excluded from an environmental analysis under NEPA. This project is no exception, and the Forest Service should allow an administrative appeal under 36 C.F.R. § 215 *et seq*. of the final decision issued for this project.

6. <u>The Forest Service must use the "best available science."</u>

Current Forest Service regulations require that projects that implement forest plans consider the best available science in their analysis. 36 C.F.R. § 219.35(a), (d) (2000); 69 Fed. Reg. 58055 (Sept. 29, 2004). To correctly apply this standard, the Forest Service "should seek out and consider all existing scientific evidence relevant to the decision and it cannot ignore existing data. . . . The Forest Service must determine which data are the most accurate, reliable, and relevant, and that will be reviewed deferentially, but it still must be good science-that is reliable, peer reviewed, or otherwise complying with valid scientific methods." *Ecology Center v. U.S. Forest Service*, 451 F.3d 1183, 1194, n. 4 (10th Cir. 2006).

This also means that, in the final analysis, the Forest Service must disclose and discuss the science it accepts and applies and any science that it rejected as less accurate, reliable, or relevant than the science it actually applied to the project.

For Sequoia ForestKeeper and the Kern-Kaweah Chapter of the Sierra Club,

René Voss – Attorney at Law
15 Alderney Road
San Anselmo, CA 94960
Tel: 415-446-9027
renepvoss@gmail.com

Ara Marderosian – Executive Director
Sequoia ForestKeeper
P.O. Box 2134
Kernville, CA 93238-2134
(760) 376-4434
ara@sequoiaforestkeeper.org

Georgette Theotig – Chair
Kern-Kaweah Chapter of the Sierra Club
P.O. Box 38
Tehachapi, CA 93581-0038
(661)822-4371
gtheotig@sbcglobal.net