STEWARDS OF THE SEQUOIA

Division of CTUC non profit 501c3
PO Box 267
Lake Isabella, CA 93240

December 14, 2009

Gaylon Lee, Division of Water Quality
State Water Resources Control Board
P.O. Box 2231
Sacramento, CA 95812

ForestPlan_Questions@waterboards.ca.gov
RE: Comments on Water Quality Management Plan for National Forest System Lands in California and State Water Resources Control Board Resolution No. 2009-0064

Dear Mr. Lee,

As requested by the State Water Resources Control Board (SCRCB) we are submitting these comments regarding the Water Quality Management Plan (WQMA) and State Water Resources Control Board Resolution No. 2009-0064 on behalf of Stewards of the Sequoia, Bakersfield Trailblazers, Southern Sierra Fat Tire Association, High Desert Multiple Use Coalition, Kernville Chamber of Commerce and Kern River Valley Chamber of Commerce, California Trails Users Coalition, California Off Road Vehicle Association, Stewards of the Sierra, Lake Isabella-Bodfish Homeowners Association, Piute Mountain Recreation Club, Valley View Homeowners, Piute Mountain Homeowners, Arrow T Ranch, as well as the public who enjoy the Sequoia National Forest and are concerned about the health of the forest.

The signers on this comment letter have collectively adopted 20 of the 22 multiple use trails in the Sequoia Adopt A Trail program in the planning area. We therefore represent the segment of the public that cares enough about the planning area to roll up our sleeves to help.

Diverse recreation interests including 4x4, ATV, dirt bike, mountain bike, hiking and horse back as well as ranching supporting this comment letter.

Additionally both Chambers of Commerce and numerous Homeowners Associations are signers, representing the local businesses and residents in the planning area.

We support active management in order to promote Forest Health, Improve the Watershed, reduce fuel loads, benefit recreation and the associated benefit to the local economy and the public. We support any efforts by the USFS to perform much needed active management to reduce fuel loads and risk of wildfire in order that we may still have a Forest for current and future generations.

According to the USFS 2009 Report the existing Forest Water Management Program and BMP's have been extremely effective. We support the fine tuning of the existing program, but not the proposed action by the SWRCB to create a single statewide approach. We feel the proposal will be extremely costly, unresponsive to local needs and perhaps detrimental to water quality, compared to fine tuning the existing program.

Thank you for considering our comments.

Sincerely,

Chris Horgan, Executive Director
Stewards of the Sequoia
PO Box 267
Lake Isabella, CA 93240
chris@stewardsofthesequoia.org

Jon Aichele, Land Use Chairman
Bakersfield Trailblazers
3810 Phaffle Dr
Bakersfield, CA 93309
jons4x4@aol.com

Ron Schiller, Chairman
High Desert Multiple Use Coalition
PO Box 1167
Ridgecrest, CA 93556
schiller@ridgenet.net

Jim McWhorter, Board
Southern Sierra Fat Tire Association
2001 Columbus Ave Suite B
Bakersfield, CA 93305
jimmcwhorter@earthlink.net

Jill Thurman, President
Kernville Chamber of Commerce
PO Box 397
Kernville, CA 93230
kvcheryl@aol.com

Ray Thurm, President
Kern River Valley
Chamber of Commerce
PO Box 567
Lake Isabella, CA 93240
vuroom@mchsi.com

Amy Granat, Boardmember
California Trail Users Coalition
PO Box 298
Clarksburg, CA 95612
Granat.Amy@gmail.com

Kyra, Comments Project Committee Chair
California Off-Road Vehicle Association
PO Box 988
Cedar Ridge, CA 95924
Kyra@CORVA.org

Mike Wubbels, Executive Director
Stewards of the Sierra
PO Box 601
North Fork, CA 93643
mwubbels@comcast.net

Hayward Mendenhall
Valley View Homeowners
PO Box 218
Weldon, CA 93283
haywardsoutback1@aol.com

Hayward Mendenhall
Piute Mountain Recreation Club
PO Box 218
Weldon, CA 93283
haywardsoutback1@aol.com

Mike Graves
Piute Mountain Homeowners
306 Burlando
Kernville, CA 93238
micheal_graves@sbcglobal.net

Ron Benoit- President
Lake Isabella-Bodfish Homeowners Assoc.
1 Dow Avenue
Bodfish, CA 93205
onedow@earthlink.net

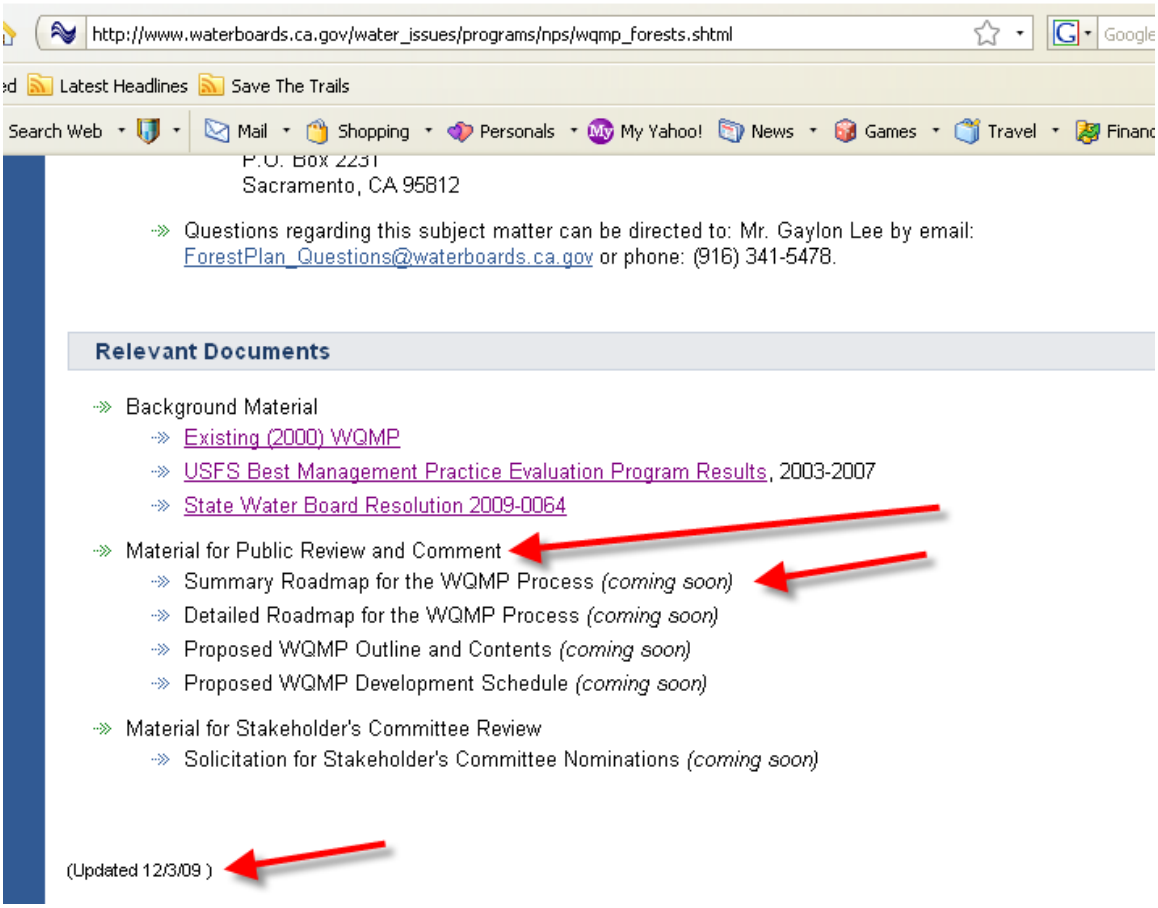
Dee Stevens, Tamara Barkley-Owners
Arrow T Ranch
7100 Caliente-Bodfish Rd
Havilah, CA 93518
arrowt1234@aol.com

TABLE OF CONTENTS

~Continued on Next Page~

1. Documents Not Provided For Public Comment

As of the final day of the public comment period the State Water Resource Control Board has not provided the documents which they wish the public to review and comment as shown below such as the Roadmap for the WQMP Process.



Clearly the public cannot be expected to make substantive or any other type of comments if the documents are not provided to them. Numerous requests for these documents by the public were never responded to by State Water Resource Control Board.

RECOMENDATION: In order to comply with NEPA and/or CEQA, as well as to enable comments to be written, the SWRCB should provide all the documents related to this WQMP on their website and restart the comment period.

~Continued on Next Page~

2. What Determined The Most Important Types Of Pollution?

The SWRCB resolution # 2009-0064 states on Page 1:

> *8. Since 1981, there have been some changes in the most important types of pollution-producing activities (e.g., off-road vehicles, grazing) on USFS lands.*

Please provide the methodology, reports, studies and other documentation which led to the above determination that off-road vehicles, grazing are the most important types of pollution-producing activity.

Most of today's Wildfires are caused by high fuel loads created by a hundred years of fire suppression and lack of management. Since the Wildfires have been caused by management decision these fires are an "activity. Therefore Wildfires must be the greatest pollution-producing activity.

RECOMENDATION: The SWRCB should list Wildfires as the by far the greatest pollution-producing activity.

3. Forest Service Invaluable Asset Regarding Impaired Water Bodies

The SWRCB resolution # 2009-0064 states on Page 2:

> *13. The expertise, resources, and authorities of **USFS can be an invaluable asset** to the Water Boards in maintaining water quality where it is in good condition, protecting it where it is threatened, and contributing to its restoration where it is **impaired**.*

However this invaluable asset, the USFS, has been forced to resort to submitting letters and documentation (Exhibit A)"challenging" the Regional Water Quality Control Board to remove the following water bodies from the list of Water Bodies being considered for Impaired Water Body 303d listing.

1. Kern River, North Fork (pH, sources unknown),
2. Lake Isabella (pH, DO, sources unknown),
3. Kern River, Lower (pH, sources unknown),
4. Deer Creek, (pH, unknown toxicity, sources unknown), and
5. Hume Lake, (DO, sources unknown).

Directly relating to this Items #14, 15 & 16 the intent of this WQMA plan is:

> *14. The State Water Board desires:*
> *b. **To minimize duplication of effort and unnecessary regulatory burdens***
> *c. To accomplish water pollution control and environmental restoration in the **most efficient and effective manner***
> *d. To enhance transparency and accountability through coordinated and consolidated water quality monitoring and reporting program requirements*
>
> *15. **A more streamlined and consistent statewide approach would benefit the USFS by**:*

*a. **Allowing it to address problems in a manner more consistent with its own policies and programs** and with greater self-determination*

*16. **A more streamlined and consistent statewide approach would benefit the Water Boards by**:*
*c. **Maximizing the efficient use of USFS expertise, resources, and authorities for water quality protection***

17. A more streamlined and consistent statewide approach would benefit the quality and beneficial uses of water by:
*a. **Allowing USFS and Water Boards' resources to be collaboratively focused** where the need and potential benefits are greatest*

The SWRCB states a willingness to achieve the above objectives such as: minimizing duplication and unnecessary regulatory burdens, yet the actual SWRCB practices are currently contrary to them.
The SWRCB seeks to collaborate with the USFS yet currently the USFS recommendations are not followed regarding Impaired Water Bodies.

RECOMENDATION:

1. We submit that ***a more streamlined and consistent statewide approach would benefit the SWRCB*** would be for the SWRCB to change their current practices to utilize the USFS "expertise" and "resources".
2. Based on their stated intent the SWRCB should remove the above listed water bodies as well as any others that USFS has requested to be removed from consideration as Impaired 303d Water Bodies.

4. Clarification Of Intent

The SWRCB resolution # 2009-0064 states on Page 2:

d. Freeing the Regional Water Boards to use their resources in the field with the USFS directly managing rather than preparing and adopting orders or plans.

Does this mean that the Regional Water Board (RWB) will be directly managing USFS lands rather than preparing and adopting orders or plans, or that the USFS will no longer have to adopt orders or plans?

In either case this seems to be mistaken. The RWB has led us to believe that they have no authority to perform management, and the USFS has the authority to adopt orders as well as plans.

RECOMENDATION: The SWRCB should remove item (d) above or clarify it based on actual agency authority.

5. Existing Water Quality Management For Forest Lands Is Working

The USFS report ***Water Quality Protection on National Forests in the Pacific Southwest Region: Best Management Practices Evaluation Program, 2003-2007 (September 2009)***

Tells us the program is extremely effective. For example the report states on Page 2:

> *For the 5-year reporting period, 86% of Best Management Practices (BMPs) were rated as implemented and 89% were rated as effective. Among implemented BMPs, 93% were rated effective.*
> *Several BMPs have been 95 to 100% effective when implemented, including almost all BMPs for timber harvests, vegetation management, and prescribed fire. Given the documented performance of these BMPs, effectiveness monitoring of these protocols can be reduced in the future in order to focus on areas where improvement is needed. (Page 2)*

The SWRCB should follow the recommendation of the USFS based on the effectiveness of the existing program to reduce protocols and fine tune the existing program. However the current SWRCB resolution # 2009-0064 seeks to scrap the Regional Water Boards, which presumably are responsible for the current effective program in favor of a far less responsive State Program. The SWRCB has not demonstrated a Purpose and Need for this major change.

RECOMENDATION: The SWRCB WQMA revision should focus on ways to reduce protocols and fine tune the existing effective program per the expert recommendations by USFS.

6. Forest Service Best Able To Manage National Forest Lands

The SWRCB resolution # 2009-0064 states on Page 3:

> *1. Intends to combine current Regional Water Board requirements for NFS lands into a single statewide regulatory approach that accommodates appropriate regional differences.*

Yet the USFS already has the Best Management Practices and other guidelines and regulations by which the USFS can manage the watershed most effectively.

RECOMENDATION:

1. The stated goals of the SWRCB to eliminate duplication, streamline and be most effective, can best be met by SWRCB limiting their involvement to working with USFS to fine tune existing procedures, not direct involvement in USFS management, plans or issues.
2. The SWRCB should not create a single statewide regulatory board as that would be far less responsive to local needs.
3. There are already stringent water protection requirements in place which the USFS must comply with and which already consume a significant amount of USFS staff time and may be counter productive. The SWRCB should let USFS manage USFS lands and watersheds with minimum involvement by SWRCB.

~End Comments~

EXHIBIT A (USFS Challenge Regarding Impaired Water Bodies)

File Code: 2500

Date: March 13, 2009

Mr. Danny McClure
Regional Water Quality Control Board
Central Valley Region
11020 Sun Center Drive, #200
Rancho Cordova, CA 95670-6114

Dear Mr. McClure:

The Sequoia National Forest appreciates the opportunity to comment on water bodies proposed for addition to the State of California's 303(d) List of Impaired Water Bodies and would like the following information considered and included in the administrative record. Based on Appendix A, (Proposed Changes to the 303(d) List, Central Valley Regional Water Quality Control Board (CVWQCB) Clean Water Act Section 305(b) and 303(d) Integrated Report for the Central Valley Region, January 2009 Public Review Draft) the following water bodies, or portions thereof, are located on National Forest Lands and are under consideration for listing:

6. Kern River, North Fork (pH, sources unknown),
7. Lake Isabella (pH, DO, sources unknown),
8. Kern River, Lower (pH, sources unknown),
9. Deer Creek, (pH, unknown toxicity, sources unknown), and
10. Hume Lake, (DO, sources unknown).

The Sequoia National Forest respectfully challenges the listing of the following rivers on National Forest Lands as they are and remain unaffected by actions that could potentially affect the pH, DO, or toxicity:

1. Kern River, North Fork from the Forest boundary to it's headwaters in the Sequoia National Park;
2. Lake Isabella, from Isabella Dam upstream to elevation 2605 feet above sea level;
3. Kern River, Lower, from Isabella Dam downstream to the Sequoia National Forest Boundary;
4. Deer Creek from the Forest boundary to its headwaters; and
5. Hume Lake, from Hume Dam to the beginning of the lake approximately 5200 feet above sea level.

The Sequoia National Forest challenges the listing of the above water bodies on National Forest Lands based on the following:

- The Forest has implemented, monitored, and been effective in the protection of water quality through its BMP program.
- North Fork Kern River has a Wild and Scenic Designation; flows through Sequoia National Park; and the Golden Trout Wilderness.

- The water quality sampling performed by the Water Quality Control Board from 2/2002 to 5/2004 represents conditions for the lowest water years within a 15 year period and as such is not representative of normal conditions. Sampling for pH and DO would be considered indicative of a temporal trend.
- The water quality sampling performed by the Water Quality Control Board from 2/2002 to 5/2004 represents conditions following one of the worst fire years on record for the Kern River Watershed as impacts of these fires were document to have affected water quality for up to three years following the events. This sampling would be considered indicative of a temporal trend.
- The potential listing of Deer Creek and North Fork Kern River extrapolates data upstream for 17 and 71 miles, respectively.
- The potential listings on the North Fork Kern River, Lower Fork Kern River and Lake Isabella fail to identify the geochemical relationships between the Kern River Fault, hot springs with naturally high pH values, carbon dioxide and chemical weathering of basic and ultrabasic rocks. This is especially critical in low water years where these effects are magnified. This sampling would be considered indicative of a temporal trend.
- The majority of DO samples not meeting water quality standards taken in Lake Isabella were taken on 12/11/2002 roughly one month after the first major storm following the McNally fire. Major flooding and mudflows were responsible for fish kills which ended up in Lake Isabella. This sampling would be considered indicative of a temporal trend.
- Beneficial uses of Water are not properly matched to habitat conditions relative to Cold/Warm water habitat designations.

Information specific to each of the above items and the affected water bodies is provided in a following section of this letter.

As the State Water Board (Board) is aware; the primary implementation mechanism for TMDL implementation is the state section 319 nonpoint source management program (BMP's). The Forest Service in Region 5 is authorized as a Designated Management Agency (DMA) under a 1981 Management Agency Agreement (MAA) with the State Water Quality Control Board and implements State approved BMP's designed to maintain water quality standards and control nonpoint source pollution.[1] As the Forest's BMP's have been approved by the State in the aforementioned MAA, they become the primary mechanism for meeting water quality standards. Based on Forest monitoring BMP's are implemented and effective in mitigation of non point source pollution and are therefore in compliance with applicable water quality standards.[2]

BMP implementation and effectiveness are monitored annually by the USFS and reported to the Regional Board. Between 1992 and 2008, BMP's monitored on the Sequoia National Forest were found to be effective in 84 % of the instances monitored. During the years monitored by the Water Board for this proposed listing (2002-2004) BMP's were found to be effective in 93 % of the instances monitored. Most recent monitoring

[1] Management Agency Agreement Between the State Water Resources Control Board, State of California And the Forest Service, United States Department of Agriculture., 1981.

[2] http://www.epa.gov/waterscience/standards/library/npscontrols.pdf, EPA, Water Quality Standards Handbook, Chapter 2, General Program Guidance, Page 2-25, NONPOINT SOURCE CONTROLS AND WATER QUALITY STANDARDS, August 19, 1987

2004-2008, found BMP's to be effective in 96% of the instances monitored. The Sequoia National Forest provides copies of annual monitoring results to the Central Valley Water Quality Control Board on an annual basis. This board has never responded negatively or suggested our management to be inadequate. Reports to the Water Board provide evidence of compliance with water quality standards and protection of beneficial uses. Therefore, the forest is confident that resource management activities provide a high level of protection for beneficial uses of water.

Information Specific to Proposed 303(d) Water Bodies

Kern River, North Fork

North Fork Kern River, as identified by the Board, starts above Lake Isabella and proceeds roughly 80.5 miles upstream to its headwaters; 78.5 miles are on Federal Lands. This segment flows roughly 25 miles downstream from the headwaters of the North Fork Kern in Sequoia National Park to the Golden Trout Wilderness, Sequoia National Forest. The segment continues downstream roughly 22.5 miles through the Golden Trout Wilderness. Therefore, the upper 47.5 miles of the proposed river segment flows through Sequoia National Park and the Golden Trout Wilderness. The proposed segment continues downstream about 30 miles to the forest boundary. The remainder of the reach is roughly 2.5 miles downstream through lands administered by Kern County, U.S. Bureau of Land Management (BLM), and private landowners. The nearest sampling site to the headwaters of this proposed reach is 71 miles away *and constitutes quite an extrapolation of data in order to assume conditions 71 miles upstream are similar to the section of the reach actually sampled*.

Sampling that placed North Fork Kern River for consideration on the 303(d) lists are at seven sample sites, *four of which are below Lake Isabella Dam and not in the segment under consideration*. The sites above Lake Isabella Dam are located at Springhill, River Kern Beach, and Riverside Park. Sampling occurred for roughly $2^1/_2$ years between 2/27/2002 and 5/26/2004, with each site sampled nine times. Sampling results indicate pH values range from 7.78 to 8.7. Acceptable pH ranges are 6.5 to 8.3. The source of the pH is stated as unknown. Beneficial use for North Fork Kern River is stated as *Warm Freshwater Habitat* in Appendix F, Supporting Information, Draft 2008 California 303(d)/305(b) Integrated Report, Kern River, North Fork, Decision ID 15950, pH section. Enclosure 1 provides maps and details obtained from the Central Valley Water Quality Control Board on sampling stations and sampling results.

Based on the location and extent of this reach the Sequoia National Forest feels it is inappropriate to list the segment of the North Fork Kern River on National Forest Lands. With the objective of basing listings on the most current and accurate information, the Forest offers the following information on conditions in the North Fork Kern River:

1. The U.S. Department of Agriculture Forest Service (USFS) and the U.S. Department of Interior (USDI) together manage approximately 1,020 square miles within the North Fork Kern Watershed as portions of the Sequoia National Forest and Sequoia National Park. A primary objective of the USFS in managing our portion of these lands is to improve and protect watershed conditions (USDA Forest Service Strategic Plan, 2007). The USFS recognizes its responsibilities to protect water

quality and supports the efforts of the Regional Board to enforce the Clean Water Act and the California Water Code through revision of its 303(d) list of impaired water bodies.

2. The majority of the North Fork Kern River is inaccessible from Johnsondale Bridge to the headwaters of the Kern, roughly 60 miles. This area has no road crossings above this point and is in fact so rugged and wild there is only foot access.

3. The North Fork Kern River was designated as a Wild and Scenic River by Congress on November 24, 1987 through the Wild and Scenic Rivers Act (WSRA). The extent of the Wild and Scenic designation on the North Fork Kern River is from the Tulare-Kern County line to its headwaters in Sequoia National Park. The upper 47.5 miles of the river flows through Sequoia National Park and the Golden Trout Wilderness. This is a remarkably scenic area with a wide variety of recreational opportunities, as well as cultural and historical features and is managed as such. The section 5,600 feet above Johnsondale Bridge, to Tulare Kern-County line is designated as Recreation and upstream to the headwaters as Wild, under the Wild and Scenic Rivers Act of 1987.

4. The Wild and Scenic River designation requires that the river-administering agencies are to protect the river's identified values, free-flowing condition, and associated water quality. Specifically, each component is to be "administered in such manner as to protect and enhance the values which caused it to be included in said system. . . ." The WSRA also directs other federal agencies to protect river values. It explicitly recognizes the Federal Energy Regulatory Commission, Environmental Protection Agency, and any other federal department or agency with lands on or adjacent to designated rivers or that permit or assist in the construction of water resources projects.[3] The mandate to protect river values through coordinated federal actions is found in several sections of the WSRA and are as follows:

> Section 1(b):
> *It is hereby declared to be the policy of the United States that certain selected rivers of the Nation which, with their immediate environments, possess outstandingly remarkable . . . values, shall be preserved in free-flowing condition, and that they and their immediate environments shall be protected for the benefit and enjoyment of present and future generations.*
>
> Section 7(a):
> *The Federal Power Commission shall not license the construction of any dam, water conduit, reservoir, powerhouse, transmission line, or other project works under the Federal Power Act, as amended, on or directly affecting any river which is designated in section 3 of this Act as a component of the National Wildand Scenic Rivers System . . . and no department or agency of the United States shall assist by loan, grant, license, or otherwise in the construction of any water resources project that would have a direct and adverse effect on the values for which such river was established, as determined by the Secretary charged with its administration. Nothing contained in the foregoing sentence, however, shall preclude licensing of, or assistance to, developments below or above a wild, scenic, or recreational river area or on any stream tributary*

[3] Refer to the "Wild and Scenic Rivers Act: Section 7" technical 1 paper in the interagency *Wild and Scenic Rivers Reference Guide* for the role of other federal agencies in proposing or assisting in water resources projects. The river-administering agency, through its respective Secretary, is responsible for determinations under Section 7 of the WSRA.

thereto which will not invade the area or unreasonably diminish the scenic, recreational, and fish and wildlife values present in the area on the date of designation. . . .[4]

Section 10(a):
Each component . . . shall be administered in such a manner as to protect and enhance the values which caused it to be included in said system without, insofar as is consistent therewith, limiting other uses that do not substantially interfere with the public use and enjoyment of these values. In such administration, primary emphasis shall be given to protecting its esthetic, scenic, historic, archaeologic, and scientific features.

Section 12(a):
The Secretary of the Interior, the Secretary of Agriculture, and the head of another federal department or agency having jurisdiction over any lands which include, border upon, or are adjacent to, any river included within the National Wild and Scenic Rivers System or under consideration for inclusion, in accordance with section 2(a)(ii), 3(a), or 5(a), shall take such action respecting management policies, regulations, contracts, plans, affecting such lands . . . as may be necessary to protect such rivers in accordance with the purposes of this Act.

Section 12(c):
The head of any agency administering a component of the National Wild and Scenic Rivers System shall cooperate with the Administrator, Environmental Protection Agency and with the appropriate state water pollution control agencies for the purposes of eliminating or diminishing the pollution of waters of the river.

5. Additionally 47.5 miles of this river section identified for listing runs through the Sequoia National Park and Golden Trout Wilderness. The Forest Service is responsible for administration of the Golden Trout Wilderness as directed by the Wilderness Act. The Golden Trout area became a wilderness in 1978 when 306,000 acres were designated by Public Law 95-237. The Wilderness Act states the following:

DEFINITION OF WILDERNESS
Sec. 2. (c) A wilderness, in contrast with those areas where man and his own works dominate the landscape, is hereby recognized as an area where the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain. An area of wilderness is further defined to mean in this Act an area of undeveloped Federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions and which (1) generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation; (3) has at least five thousand acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition; and (4) may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value. [5]

6. Based on the above guidance under the Wild and Scenic Act, Wilderness Act, as well as our MAA with the State Water Quality Control Board, and the Clean Water Act and responsibilities under these authorities the Sequoia National Forest would not implement any type of management that would cause impairment on the North Fork Kern River.

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[4] Section 7(b) provides the same protection to congressionally authorized, 5(a), study rivers except that the qualifying word "unreasonably" does not appear before "diminish." The effect is to provide greater protection for study rivers during the shorter term study process.

[5] http://www.wilderness.net/index.cfm?fuse=NWPS&sec=legisAct#1, *Public Law 88-577 (16 U.S. C. 1131-1136), 88th Congress, Second Session, September 3, 1964.*

7. Furthermore it seems unreasonable that a water body of this designation would be listed as a 303(d) stream by the Water Board without identification of the source of pollution and through extrapolation of sampling data collected approximately 71 miles downstream.

8. The Forest has been monitoring water quality on National Forest Lands for years. The Forest has fisheries inventories and channel stability data that go back to the early 1970's. Policy directs the Forest to investigate macroinvertebrate and stream condition inventories prior to any ground disturbing activity.[6] The Forest has extensive information along streams tributary to the North Fork Kern which includes physical, chemical and biological data. Approximately 152 miles of streams tributary to the North Fork Kern River have been surveyed for Fisheries Habitat and Stream Channel Stability since 1976. Enclosure 2 provides a summary of streams surveyed in the Kern River drainage following Stream Condition Inventory Protocol. Stream Condition Inventory surveys provide chemical, physical and biological data. Evaluation of pH values from these surveys show a pH range of 6 to 8 on streams surveyed from 2001 to 2008. Three of the sites listed as having low pH have been or are in the process of restoration. Type of restoration is provided in the enclosure under site name.

9. Based on fish population (Table 1) and water temperature monitoring completed by Southern California Edison (SCE) over the past two decades, this segment of river represents both a coldwater and transitional zone fisheries. The coldwater fishery is characterized by the presence of salmonid species, primarily rainbow trout. There are no water temperature criteria defining coldwater for this segment of the North Fork Kern River in Water Quality Control Plan for the Tulare Lake Basin. However, the California Department of Fish and Game (CDFG) generally ceases stocking of trout when temperatures exceed 68º F (20º C). Water temperature data collected for this river segment during the summers of 1998, 2001, and 2002 indicate that temperatures are influenced by water year type, with the coldwater zone (daily mean temperatures of 20º C or less) varying between Fairview and roughly 4 miles downstream of Fairview (near Gold Ledge). The transitional zone is characterized by daily mean water temperatures exceeding 20º C, along with a decreasing number of salmonids as a percentage of the fish community. The fish community downstream of Goldledge to Lake Isabella would be included under the "Pikeminnow-hardhead-sucker assemblage" described by Moyle (2002. Inland Fishes of California).

[6] Sierra Nevada Forest Plan Amendment, USDA Forest Service, United States Department of Agriculture, Forest Service, Pacific Southwest Region January 2001 and January 2004.

	Abundance Estimates (fish/km)				
	1989	1990	1991	1998	2006
Roads End					
Wild rainbow trout	320	186	113	405	215
Hatchery rainbow trout	52	144	41	14	40
Brown trout	10	0	10	0	20
Sacramento pikeminnow	1351	1423	773	14	0
Sacramento sucker	5732	2691	3062	4286	774
Hardhead	10	10	0	0	0
Common Carp	0	0	0	0	0
Total for Station	7475	4454	3999	4719	1049
Goldledge					
Wild rainbow trout	269	86	258	1496	396
Hatchery rainbow trout	75	65	108	93	0
Brown trout	0	0	0	13	0
Sacramento pikeminnow	2634	3935	1839	339	17
Sacramento sucker	3710	4065	3774	5159	3464
Hardhead	441	398	118	0	0
Common Carp	0	0	0	0	0
Total for Station	7129	8549	6097	7100	3877
Hospital Flat					
Wild rainbow trout	10	0	0	1028	0
Hatchery rainbow trout	0	0	0	85	0
Brown trout	0	0	0	0	0
Sacramento pikeminnow	2699	6117	3495	170	489
Sacramento sucker	1748	1476	2825	4700	5822
Hardhead	2194	1126	73	12	0
Common Carp	68	155	19	0	0
Total for Station	6719	8874	6412	5995	6311

Table 1: Fish Monitoring Data Collected by SCE

10. The water quality sampling period of 2/2002 to 5/2004 includes numerous wildfires that affected the water quality of the Kern River Basin. During this period the largest wildfire to burn on the Sequoia National Forest was the McNally fire. This fire burnt roughly 150,000 acres during July and August of 2002 in the North Fork Kern River basin, and the effects of the fine sediment and ash was noticed for the next three years as documented at the Kernville Fish Hatchery. Three years after the fire the fish hatchery still had problems with their ponds filling up with ash and sediment.[7] The impacts associated with wildfires could be responsible for changes in pH as values from water board monitoring efforts do not seem consistent with those taken before and after this time frame. It is expected that ash could increase pH values. A study of fire history on water quality could provide interesting relationships. Currently listing the North Fork Kern and downstream waters based on pH values collected from the time period of 2/2002 to 5/2004 could be considered indicative of a temporal trend.

[7] http://www.kvsun.com/articles/2006/10/05/news/04hatchery.txt

11. Water chemistry data collected by the USGS on the Sequoia National Park and Sequoia National Forest indicate the following pH values range from 6.5 to 8.3 from 1960-1975 and 1975-1993. Six samples exceed standards set by the Water Board in this time frame. BMP implementation and effectives and soil and water considerations have increased since this time. Enclosure 3 provides pH values from USGS sites in the North Fork Kern River from the Park and stations 11187000 KERN RIVER ABOVE KERNVILLE CA and 11186000 KERN R NR KERNVILLE (RIVER ONLY) CA.

12. Geologically the Kern Canyon is well known for the Kern Canyon Lineament. A series of faults (White Wolf, Breckenridge Mountain, Havilah Valley, Hot Springs, and Kern Canyon faults) are responsible for the structural patterns called the "Kern Canyon Lineament[8]." The most well known earthquake associated with these faults was the Arvin-Tehachapi earthquake of 1952. The Kern Canyon Lineament runs roughly parallel to the Kern River below Lake Isabella, through Lake Isabella, and roughly parallel to the North Fork Kern River where it sometimes occupies river valley. Webb (1936[9]) traced the Kern Canyon Fault from Kernville (which was located pre-reservoir at the time in Lake Isabella near Wofford Heights) to the mouth of Golden Trout Creek, roughly 40 miles. Later in 1940, Miller and Webb[10] extended the Kern Canyon Fault northward to roughly 118°15' or to the north boundary of the Kernville quadrangle.

    Numerous spring deposited travertine outcrops have been identified in the area. A 1979 compilation of these deposits and associated carbon dioxide springs was published by Feth and Barns in 1979.[11] Donald C. Ross, 1983, mapped travertine deposits in a reconnaissance of the White Wolf-Breckenridge-Southern Kern Canyon Fault Zone.[12] Extensive outcrops of gabbro and ultramafic rocks are shown in the area. It is written in the description of map units for this area that, "…gabbro, and lesser dunite and weherlite *are in part serpentinized."* Gabbroic rocks are found south of Wofford Heights marina and as a large inclusion near the west end of Wofford Heights. Mafic Rocks, gabbroic or amphibolic rocks are found in the Bull Run Basin, northeast of the Walker Basin, south of Weldon, east of Big Meadow, between the two dam sites, along the west bank of Isabella across from Rocky Point, and from above Waggy Flat to just north of Walker Basin crossing the lower Kern River. The existence of travertine deposits along a fault zones issuing carbon dioxide rich waters associated with serpentinized rocks is significant with respect to the pH of surface waters.

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[8] Webb, R. W., 1952, Kern Canyon Lineament in Earthquakes in Kern County California During 1952, California Division of Mines, Bull. 171, November 1955, p. 35-36.

[9] Webb, R. W., 1936, Kern Canyon Fault. Southern Sierra Nevada: Journal of Geology, v. 44, p. 631-638.

[10] Miller, W. J. and Webb, R. W., 1940, Descriptive geology of the Kernville quadrangle, California: California Journal of Mines and Geology, v. 36, no. 4, p. 343-378.

[11] Feth, J. H., Barnes, Ivan, 1979, 'Spring-Deposited Travertine in Eleven Western States, U.S. Geological Survey Water Resources Investigations, 79-35 Open file report.

[12] 1983, Ross, D. C., Reconnaissance Geologic Map of Basement Rocks Along the White Wolf-Breckenridge-Southern Kern Canyon Fault Zone, Southern Sierra Nevada, California, USGS, Bulletin 1651, Plate 1.

Carbon dioxide rich waters are commonly associated with active faults (Barns and others, 1975[13]; Irwin and Barnes, 1975[14]; Feth and Barnes, 1979[15]). It is documented that groundwaters associated with serpentinization are characterized by a high pH (Pentecost, 2005[16]; Barnes and O'Neil, 1969[17]). Pentecost (2005[15]) describes the reaction of carbon dioxide and bicarbonate present within groundwater to react with aqueous OH^- yielding waters with pH that can exceed 9 and often lead to deposition of travertine.[18] Examples of travertine deposition and high pH waters associated with serpentinization occur through out California and the world (O'Neil and Barns, 1971[19]).

Chemical and isotope data image search of USGS database provides data in support of the geochemical reactions suggested in this section. Two hot springs in the Kern Canyon associated with mafic and ultramafic rocks have pH levels of 9.61 and 9.25, both values taken in 1975 at Democrat Hot Springs and Miracle Hot Springs, respectively. As expected calcium and magnesium values for the site were low at 1.6 and <0.1 for Democrat and 1.5 and <0.1 for Miracle Hot Springs, available calcium and magnesium would have precipitated out in the formation of travertine (Ca, Mg SiO_2). While these locations are in the Lower Kern Canyon it demonstrates the relationship between carbon dioxide rich waters along fault zones and serpentinization.

Based on the structural, petrographic and geochemical relationships surrounding the sampled sites in the Kern Canyon it is evident that some increases in pH could be associated with faulting, serpentinization, and deposition of travertine and not management activity. Evaluation of these conditions through study would provide a much better understanding of source and defining an attainable water quality standard. It is expected that the current conditions are from anthropogenic causes. While these conditions are present just above Kernville and they do not extend upstream through the entire reach being considered for listing, conditions are more pronounced in Lake Isabella and along the Lower Kern River.

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[13] Barns, Ivan, Irwin, W. P., Gibson, H. A., 1975, Geologic map showing springs rich in carbon dioxide or chloride in California: U. S. Geological Survey Water Resources Open File Map.

[14] Irwin, W. P., Barnes, Ivan, 1975, Effects of Geologic Structures and Metamorphic Fluids on Seismic Behavior of the San Andreas Fault System in Central and Northern California: Geology, v. 3, p. 713-716.

[15] Feth, J. H., Barnes, Ivan, 1979, 'Spring-Deposited Travertine in Eleven Western States, U.S. Geological Survey Water Resources Investigations, 79-35 Open file report.

[16] Pentecost, Allan, 2005, Travertine, Springer, Netherlands, 445 p.

[17] Barns, Ivan, O'Neil, J. R., 1969, The Relationship between Fluids in Some Fresh Alpine-Type Ultramafics and Possible Modern Serpentinization, Western United States: Geological Society of America Bulletin, v. 80, p 1947-1960.

[18] Chemical reactions to increase pH are documented inEnclosure 4.

[19] O'Neil, J. R., Barns, Ivan, 1971, C13 and O18 compositions in some freshwater carbonates associated with ultramafic rocks and serpentinites: western United States', Geochim. Cosmochim. Acta, 35, 687-697

13. The water quality sampling performed by the Water Quality Control Board from 2/2002 to 5/2004 was performed during low water conditions. The average flow above Isabella during this time was 697 cfs. Average flow conditions above Lake Isabella from 1994 to 2004 are 1040 cfs. It is reasonable to expect pH value to be higher as inflow from hot springs with naturally high pH waters would be less diluted during low flow conditions. The results of this sampling would be considered to document a temporal trend.
14. Riparian grazing allotment transects monitoring data collected at North Fork Kern River sites between 2000 and 2007. The purpose of the US forest Service Region 5 Range Monitoring Project is to establish permanent plots on key range sites across National Forest lands in Region 5 (California) in order to provide long-term monitoring of range condition. Each site will be reread after five years. In addition, the project is designed to provide an ecological classification (vegetative, soils, and hydrologic) and quantitative condition scorecards for meadows. These products are intended for use by range conservationists, wildlife biologists, hydrologists, soil scientists, and fisheries biologists in inventorying and assessing meadow conditions.[20] Enclosure 5 provides data collected for the Range Monitoring Program in the North Fork Kern Watershed.

Lake Isabella

This water segment, as identified by the Board, appears to include lake lands below 2605 feet elevation to Isabella Dam. Sampling that placed Lake Isabella for consideration on the 303(d) lists are at nine sites along the lake. The locations of these sites are at Tillie Creek, Boulder Gulch, Pioneer Point, Main Dam, South Fork Recreation Area, French Gulch, Camp 9, Hanning Flat, and Wofford Heights. Sampling occurred for $2^1/_2$ years from 2002 to 2004. Findings of the water board sampling indicate pH values range from 7.4 to 10.2 and DO value range from 4.2 to 12.44. Acceptable pH ranges are 6.5 to 8.3 and DO are 7 mg/l and above. The source of the pH and the DO is stated as unknown. Beneficial use for Lake Isabella is stated as *Cold Freshwater Habitat* in Appendix F, Supporting Information, Draft 2008 California 303(d)/305(b) Integrated Report, Kern River, Lake Isabella, Decision ID 15951, DO and 15952 pH sections. Enclosure 1 provides maps and details obtained from the Central Valley Water Quality Control Board on sampling location and sampling results.

Based on the location and extent of this reach the Forest Service feels it is inappropriate to list Lake Isabella. With the objective of basing listings on the most current and accurate information, the Forest offers the following information on conditions in Lake Isabella:

1. The USFS and USDI manage approximately 1,410 square miles of the 2,074 square mile watershed that drains into Lake Isabella. A primary objective of the USFS in managing our portion of these lands is to improve and protect watershed conditions (USDA Forest Service Strategic Plan, 2007). The USFS recognizes its responsibilities to protect water quality and supports the efforts of the Regional Board

[20] USFS Region 5 Range Monitoring Project, 2006 Report, by: Dave Weixelman, Range Ecology, U.S. Forest Service, Nevada City, CA , April 27, 2007, http://fsweb.r5.fs.fed.us/unit/nrm/range/monitoring/2006_R5_range_monitoring_rpt.pdf

to enforce the Clean Water Act and the California Water Code through revision of its 303(d) list of impaired water bodies.

2. The Forest has been monitoring water quality on National Forest Lands for years. The Forest has fisheries inventories and channel stability data that go back to the early 1970s. New policy directs the Forest to investigate macroinvertebrate and stream condition inventories prior to any ground disturbing activity.[21] The Forest has extensive information along streams that flow into Lake Isabella which includes physical, chemical and biological data. Roughly 166 miles of stream that flow in to Lake Isabella have been surveyed for Fisheries Habitat and Stream Stability since 1976. Enclosure 2 provides a summary of all streams surveyed in the Kern River drainage following Stream Condition Inventory Protocol. These surveys provide chemical, physical, and biological data. Evaluation of pH values from these surveys show a pH range of 6 to 8 on streams surveyed from 2001 to 2008. As mentioned above three of the sites with pH values of 6 are in the process of or have recently been restored. All three of these sites are located in areas tributary to the North Fork Kern. Type of restoration is provided in the enclosure under site name.
3. The water quality sampling period of 2/2002 to 5/2004 includes numerous wildfires that affected the water quality of the Kern River Basin. During this period the largest wildfire to burn on the Sequoia National Forest was the McNally fire. This fire burnt roughly 150,000 acres during July and August of 2002 in the North Fork Kern River basin, and the effects of the fine sediment that included ash was noticed for the next three years as documented at the Kernville Fish Hatchery. Three years after the fire the fish hatchery still had problems with their ponds filling up with ash and sediment.[22] The Borel fire burned 3,430 acres in the summer of 2002 from below Isabella Dam at Borel Power House to the Lake Office. A total of 168,014 acres burned from 2002 to 2004 adjacent or upstream of Lake Isabella and Kern River. A table of fire events and size are displayed in enclosure 1. Ash from these fires was deposited into Lake Isabella. Impacts associated with wildfires could be responsible for changes in pH, as values from water board monitoring efforts do not seem consistent with those taken before and after this time frame. It is expected that ash could increase pH values. The proposal of listing the North Fork Kern and downstream waters based on pH values collected from the time period of 2/2002 to 5/2004 could be considered indicative of a temporal trend.
4. Fish kills followed the McNally fire. The National Weather Service in their report following the first major storm to affect the area after the McNally fire documented the presence of fish kills as a result of flooding and debris slides in the Kern Canyon.[23] They state,

> *"…Erosion problems associated with the McNally Fire in Southeast Tulare and Northeast Kern Counties, debris was spread across many mountain roads in the area as well as contributing to a fish kill in the Kern River. Additional flooding and mudslide problems were noted along Highway 178 in Kern County. Peak flow into Lake Isabella from the Kern River was 26,500 CFS on Friday*

[21] Sierra Nevada Forest Plan Amendment, USDA Forest Service, United States Department of Agriculture, Forest Service, Pacific Southwest Region January 2001 and January 2004.

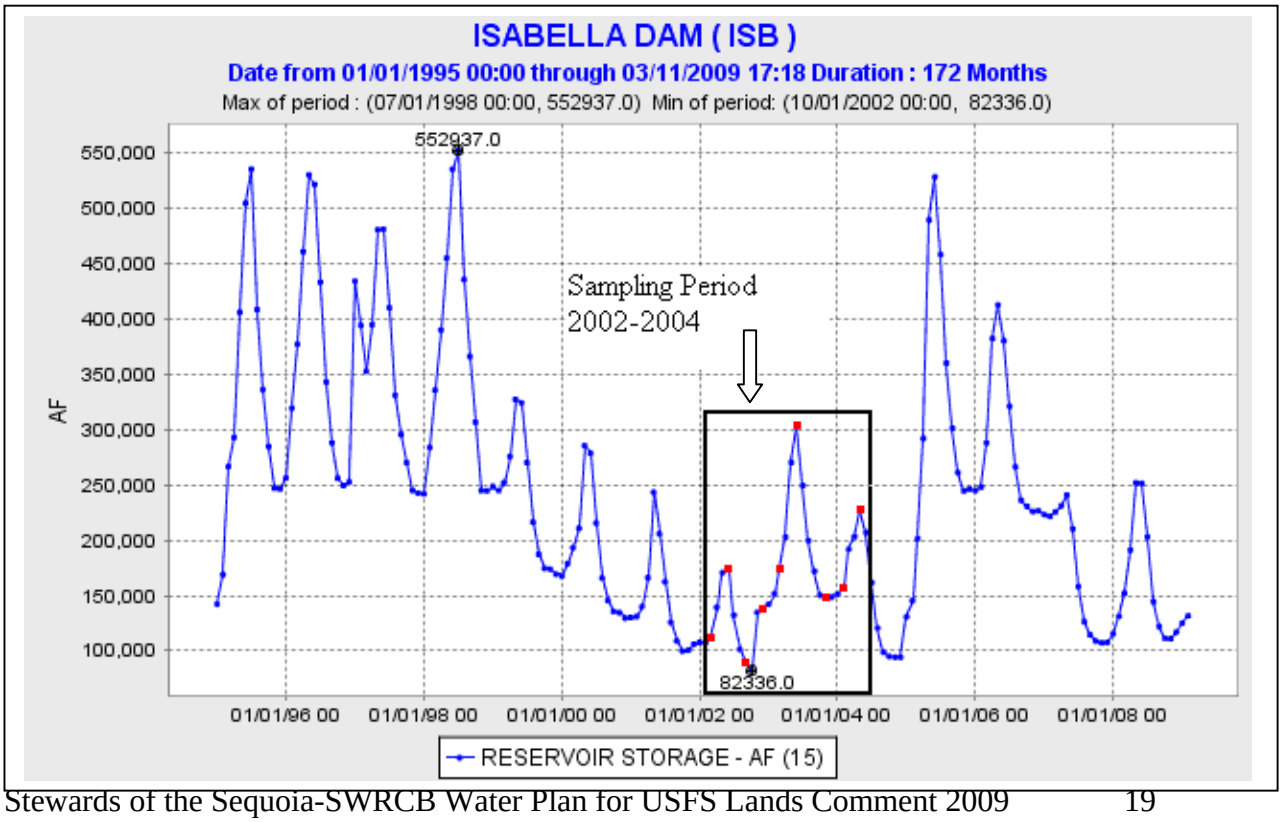
[22] http://www.kvsun.com/articles/2006/10/05/news/04hatchery.txt

[23] November 2002, National Weather Service and Unusual Weather Phenomena, http://www.wrh.noaa.gov/hnx/stormdat/2002nov.pdf

night, the 8th (2002). The lake storage increased from 82,000 acre-feet to 109,000 acre-feet and increased in elevation 5 feet in a 2-day period from the 8th to 9th."

The dead fish ended up along the banks of Lake Isabella. It is expected that DO levels would be decreased as a result of the decaying fish. It is most interesting to note that the majority and the lowest DO values presented by the Water Quality Control Board as not meeting standards were taken on 12/11/2002 (4.2 – 5.91) roughly one month after the report of fish kills. These values constitute seven of a total of ten samples that do not meet standards. The three remaining DO values not meeting standards were collected on 6/19/2002 (6.03, 6.91) and 9/17/2002 (6.53). The proposal of listing Lake Isabella based on DO values collected from the time period of 2/2002 to 5/2004 could be considered indicative of a temporal trend. Furthermore DO samples were taken during the lowest water years within a 15 year period.

5. The water quality sampling period of 2/2002 to 5/2004 was taken during the lowest water years within a 15 year period. As mentioned above in the section on the North Fork Kern River, geology has a part to play relative to pH values. Documented pH for hot springs has pH levels of 9.61 and 9.25, both values taken in 1975 at Democrat Hot Springs and Miracle Hot Springs, respectively. During low water years the pH from these springs would be less diluted in affected water bodies. Furthermore as discussed later in this section DO values are a function of water depth, temperature in addition to the presence of decaying organic material. The Graph 1 provides a reference of water storage in Lake Isabella during the 2/2002 to 5/2004 sampling period relative to water storage in previous and subsequent years over a 15 year period[24]. Based on this information listing Lake Isabella based on DO and pH values collected from the time period of 2/2002 to 5/2004 could be considered indicative of a temporal trend.



Graph 1, Monthly Reservoir from 1/1995 to 3/2009. Box represents Water Quality Control Board sampling period from 2/2002 to 5/2004.

6. Geologically Kern Canyon fault runs right down the center of Lake Isabella. The peninsula between the two Isabella dams is one of the best places to see the fault zone. Evidence of hydrothermal alteration is present at this location and has converted virtually all the original mafic minerals to muscovite, chlorite, and calcite. Map units at the dam show small bodies of gabbroic, amphibolitic rocks, or olivine gabbro (Ross, 1986[25]). This area has the same geochemical characteristics as described in the North Fork Kern River section relative to high pH values.

7. SCE completed field surveys related to water quality in the Kern River and Lake Isabella to supplement the historic water quality data with more current information. These surveys included water quality sampling in the river and reservoir, a reservoir limnology survey, a water temperature monitoring study in the river, and benthic macroinvertebrate sampling in the river using California Stream Bioassessment (CSB) protocols. In addition, SCE conducted a study of non-point sources of pollution. There were seven sampling stations for the water quality survey. Station 1 was located at the Main dam in Lake Isabella. Evaluation of the data indicates that pH meets state water quality standards for Lake Isabella. Results of the study are as follows in Table 2 and 3:

Water Temperature

During most of the year, there was little stratification by depth of water temperatures in the reservoir. Stratification was greatest during May and June, when the temperature difference between the near surface water and the bottom water was about 10º F. The results of the water quality survey that was conducted in Lake Isabella and the Kern River are given below in Table 2 along with the mean daily flows corresponding to the sampling dates for each of the seven stations.

Table 2: Water temperature (º F) and mean daily flow (cfs) data for Lake Isabella and Kern River from May through September, 2001, at the seven sampling stations (Source: SCE license application, as modified by staff).

Month	***Parameter***	***Station***
		1-Main Dam Lake Isabella Station
May	*Temp*	*66.3*
June	*Temp*	*71.2*
July	*Temp*	*71.7*
August	*Temp*	*72.5*
September	*Temp*	*72.5*

Water Quality Parameters

[25] Ross, Donald C., 1986, Basement-Rock Correlations Across the White Wolf-Breckenridge-Southern Kern Canyon Fault Zone, California. US Geological Survey Bulletin #1651, Wash, USGPO

The results of the water quality study in Lake Isabella, conducted from May through September, 2001, are given below in Table 3.

Table 3: Range of water quality parameters from water quality surveys conducted May through September, 2001, at the Main Isabella Dam station (Source: SCE license application, as modified by staff).

Parameters	***Range***	***Station***
		1-Main Dam Lake Isabella Station
DO (mg/L)	*Low*	*4.9*
	High	*8.6*
pH	*Low*	*6.8*
	High	*7.6*
Conductivity (uS/cm)	*Low*	*106*
	High	*137*
Copper (µg/L)	*Low*	*1.76*
	High	*4.05*
Chloride (mg/L)	*Low*	*3.28*
	High	*4.80*
Turbidity (NTU)	*Low*	*1.32*
	High	*4.99*
Hardness	*Low*	*32.5*
	High	*42.5*
Total Alkalinity (mg/L)	*Low*	*38*
	High	*52*
Ammonia as N (mg/L)	*Low*	*0.09*
	High	*0.12*
Nitrate as N (mg/L)	*Low*	*0.22*
	High	*0.30*
Nitrite as N (mg/L)	*Low*	*0.009*
	High	*0.009*
Orthophosphate as P (mg/L)	*Low*	*0.016*
	High	*0.016*
Fecal Coliform (MPN/100ml)	*Low*	*1.0*
	High	*1.0*

The reservoir limnology survey was conducted from August to November, 2001. Three sampling stations were used in this survey, one near the Main dam (Station 1) (same as the reservoir station for the water quality sampling survey), one near the Auxiliary dam (Station 2), and the other in the North Fork arm of the reservoir (Station 3). Water samples were collected monthly from three depths at each station: 3 feet below the surface (a), mid-depth (b), and 3 feet above the bottom (c). The results of the reservoir limnology survey are given in Table 4.

Table 4: Range of water quality parameters from the reservoir limnology survey conducted from August through November, 2001, at the three sampling stations (1=Main dam, 2=Auxiliary dam, 3=North Fork Kern River, a=3 feet below surface, b=mid-depth, c=3 feet above bottom) (Source: SCE license application, as modified by staff).

Parameter **Conductivity **Total Alkalinity ***Orthophosphate as P*	***Range***	***Station***								
		1a	***1b***	***1c***	***2a***	***2b***	***2c***	***3a***	***3b***	***3c***
DO (mg/L)	*Low*	*4.9*	*5.8*	*0.1*	*4.3*	*3.7*	*2.7*	*6.4*	*6.4*	*3.8*
	High	*6.8*	*5.9*	*5.9*	*8.0*	*7.5*	*7.1*	*8.7*	*7.4*	*7.4*
pH	*Low*	*6.80*	*6.62*	*6.30*	*6.80*	*6.80*	*6.50*	*6.90*	*6.82*	*6.88*
	High	*7.35*	*7.20*	*7.06*	*7.24*	*7.24*	*7.20*	*7.87*	*7.47*	*7.30*

Cond. (uS/cm)*	*Low*	*119*	*120*	*123*	*121*	*121*	*121*	*121*	*121*	*121*
	High	*147*	*147*	*148*	*147*	*147*	*146*	*148*	*148*	*148*
*TA** (mg/L)*	*Low*	*39*	*40*	*44*	*41*	*42*	*45*	*47*	*45*	*43*
	High	*59*	*50*	*58*	*55*	*57*	*53*	*58*	*59*	*51*
Nitrate (mg/L)	*Low*	*0.22*	*0.22*	*0.21*	*0.21*	*0.22*	*0.22*	*0.22*	*0.28*	*0.27*
	High	*0.51*	*0.51*	*0.51*	*0.45*	*0.45*	*0.46*	*0.42*	*0.43*	*0.37*
Nitrite (mg/L)	*Low*	*0.009*	*0.012*	*0.006*	*0.012*	*0.009*	*0.006*	*0.009*	*0.006*	*0.009*
	High	*0.012*	*0.012*	*0.021*	*0.018*	*0.015*	*0.015*	*0.024*	*0.024*	*0.033*
*P*** (mg/L)*	*Low*	*0.016*	*0.013*	*0.010*	*0.007*	*0.010*	*0.010*	*0.029*	*0.007*	*0.010*
	High	*0.010*	*0.020*	*0.062*	*0.085*	*0.078*	*0.026*	*0.049*	*0.179*	*0.042*

8. Based on Forest fisheries sampling data (Table 5) Lake Isabella supports primarily a centrachid sportfishery. Trout are stocked annually, but are not considered self-sustaining. The water temperature data and the fish species composition are consistent with the beneficial use of warm water fishery. The Forest would like to see a designation of warm fresh water habitat placed on this water body.

Table 5 Forest Fisheries Sampling Data 1998-2001				
Fish/Year	**1998**	**1999**	**2000**	**2001**
sucker	1	14	8	8
carp	2	8	7	7
shad			3	5
catfish	1	5	1	8
bluegill	63	18	31	31
bass	29	23	46	34
hardhead				1
rainbow trout		1	2	2
crappie	4	31	2	4

Table 5: Fish Sampling Data from Lake Isabella (data is in %)

9. Lake Isabella is a manmade lake constructed to provide flood control and irrigation. Safety issues have resulted in lowering of water surface in the lake. Lake Isabella has limited shade, hot summer air temperatures, and high winds which results in water temperatures in excess of 71^{o} F. in August. DO is a function of temperature. As seen in the above data high DO values are within water quality standards at every station monitored. It is assumed that this is a function of lake temperatures which is a function of water depth and time of year. If a designation of warm fresh water were recognized for Lake Isabella, a beneficial use much more appropriate for existing habitat conditions DO would not be an issue.

10. Riparian grazing allotment transects monitoring data collected at North Fork Kern River and South Fork Kern sites that flow into Lake Isabella collected between 2000 and 2007. The purpose of the US Forest Service Region 5 Range Monitoring Project is to establish permanent plots on key range sites across National Forest lands in Region 5 in order to provide long-term monitoring of range condition. Each site will be reread after five years. In addition, the project is designed to provide an ecological classification (vegetative, soils, and hydrologic) and quantitative condition scorecards for meadows. These products are intended for use by range conservationists, wildlife biologists, hydrologists, soil scientists, and fisheries biologists in inventorying and

assessing meadow conditions.[26] Enclosure 5 provides data collected for the Range Monitoring Program in watersheds that have the potential to affect Lake Isabella.

Kern River, Lower

This water segment as identified by the Board starts at Kern Dam and proceeds downstream 48.5 miles to the Calloway Weir. Sampling that placed Lower Kern River for consideration to the 303(d) lists are at seven sites, *four of which were included in the Kern River North Fork data set*. However, since these sites are in the Kern River, Lower reach they are included in this data set. The locations of these sites are Rancheria Road, Hart Park, Calloway Weir, Keysville Recreation Area, Democrat, Richbar, and Kern River between mile marker 14 and 15. Sampling occurred for $2^1/_2$ years from 2002 to 2004. Findings of the sampling indicate pH values from 7.6 to 8.8. The source of the pH is stated as unknown. Beneficial use for North Fork Kern River is stated as Warm Freshwater Habitat in Appendix F, Supporting Information, Draft 2008 California 303(d)/305(b) Integrated Report, Kern River, Lower, Decision ID 15949, pH section. Enclosure 1 provides maps and details obtained from the Central Valley Water Quality Control Board on sampling location and sampling results.

Based on the location and extent of this reach the Forest Service feels it is inappropriate to list the segment of the Lower Kern River on National Forest Lands. With the objective of basing listings on the most current and accurate information, the Forest offers the following information on conditions in the Lower Kern River:

1. The USFS manages approximately 151 square miles of the Lower Kern Watershed as part of the Sequoia National Forest. A primary objective of the USFS in managing our portion of these lands is to improve and protect watershed conditions (USDA Forest Service Strategic Plan, 2007). The USFS recognizes its responsibilities to protect water quality and supports the efforts of the Regional Board to enforce the Clean Water Act and the California Water Code through revision of its 303(d) list of impaired water bodies.

2. The Forest has been monitoring water quality on National Forest Lands for years. The Forest has fisheries inventories and channel stability data that go back to the early 1970s. Policy directs the Forest to investigate macroinvertebrate and stream condition inventories prior to any ground disturbing activity.[27] The Forest has extensive information along streams tributary to the Lower Kern which includes physical, chemical, and biological data. Roughly 30 miles of stream that flow in to Lower Kern have been surveyed for Fisheries Habitat and Stream Channel Stability since 1976. Enclosure 2 provides a summary of all streams surveyed in the Kern River drainage following Stream Condition Inventory Protocol. These surveys provide chemical, physical, and biological data. Evaluation of pH values from these surveys show a pH range of 6 to 8 on streams surveyed from 2001 to 2008. None of

[26] USFS Region 5 Range Monitoring Project, 2006 Report, by: Dave Weixelman, Range Ecology, U.S. Forest Service, Nevada City, CA , April 27, 2007, http://fsweb.r5.fs.fed.us/unit/nrm/range/monitoring/2006_R5_range_monitoring_rpt.pdf

[27] Sierra Nevada Forest Plan Amendment, USDA Forest Service, United States Department of Agriculture, Forest Service, Pacific Southwest Region January 2001 and January 2004.

the watersheds that flow into the Lower Kern River exceed water quality standards for pH.

3. Fish sampling from this segment of the Kern River conducted by SCE indicates the Pikeminnow-hardhead-sucker assemblage, along with a non-native centrachid fishery. Some hardhead minnow are present and the primary sportfishery is for smallmouth bass. Water temperatures and species composition are consistent with a warmwater fishery, although rainbow trout are stocked in some segments when water temperatures are less than 68º F.

4. Geologically the Lower Kern Canyon located along the Kern Canyon Lineament has the same geochemical characteristics as the North Fork Kern River relative to high pH values. Ultrabasic rocks are present below the dam to about the vicinity of Borel Powerhouse. This area has the same geochemical characteristics as described in the North Fork Kern River section relative to high pH values. Chemical and isotope data image search of USGS database provides data in support of the geochemical reactions suggested in this section. Two hot springs in the Kern Canyon associated with mafic and ultramafic rocks have pH levels of 9.61 and 9.25, both values taken in 1975 at Democrat Hot Springs and Miracle Hot Springs, respectively. As expected calcium and magnesium values for the site were low at 1.6 and <0.1 for Democrat and 1.5 and <0.1 for Miracle Hot Springs, available calcium and magnesium would have precipitated out in the formation of travertine (Ca, Mg SiO_2).

5. The water quality sampling performed by the Water Quality Control Board from 2/2002 to 5/2004 was performed during low water conditions. The average flow above Isabella during this time was 697 cfs. Average flow conditions above Lake Isabella from 1994 to 2004 are 1040 cfs. It is reasonable to expect pH value to be higher as inflow from hot springs with naturally high pH waters would be less diluted during low flow conditions.
6. Water chemistry data collected by the USGS in on the Sequoia National Forest indicate the following pH values range from 6.5 to 8.3 from 1960-1966. One sample exceeds standards set by the Water Board in this time frame. BMP implementation and effectives and soil and water considerations have increased since this time. Enclosure 3 provides pH values from USGS sites in the USGS 11191000 KERN RIVER BELOW ISABELLA DAM CA.

7. SCE completed field surveys related to water quality in the Kern River and Lake Isabella to supplement the historic water quality data with more current information. These surveys include water quality sampling in the river and reservoir, a reservoir limnology survey, a water temperature monitoring study in the river, and benthic macroinvertebrate sampling in the river using California Stream Bioassessment (CSB) protocols. In addition, SCE conducted a study of non-point sources of pollution. There were seven sampling stations for the water quality survey. Station 1 was located at the Main dam in Lake Isabella; Stations 2, 3, 4, and 5 were located in the bypassed reach of the Kern River; Station 6 was located at the Borel powerhouse tailrace; and Station 7 was located in the Kern River downstream of the powerhouse. Evaluation of the data indicates that pH meets state water quality standards for Lower Kern River sampling. Results of the study are as follows:

Water Quality Parameters

The results of the water quality study in Lake Isabella and the Kern River, conducted from May through September, 2001, are given below in Table 6.

Table 6: Range of water quality parameters from water quality surveys conducted May through September, 2001, at the seven sampling stations (Source: SCE license application, as modified by staff).

Parameters	*Range*	*Station*						
		1-Main Dam	*2*	*3*	*4*	*5*	*6*	*7*
DO (mg/L)	*Low*	*4.9*	*2.3*	*4.5*	*7.8*	*8.3*	*7.7*	*7.4*
	High	*8.6*	*9.0*	*8.4*	*8.9*	*9.1*	*8.9*	*8.6*
pH	*Low*	*6.8*	*6.5*	*6.6*	*6.8*	*7.0*	*7.0*	*7.0*
	High	*7.6*	*7.1*	*7.1*	*7.9*	*7.6*	*7.4*	*7.5*
Conductivity (uS/cm)	*Low*	*106*	*104*	*105*	*104*	*103*	*108*	*106*
	High	*137*	*129*	*126*	*131*	*144*	*126*	*127*
Copper (µg/L)	*Low*	*1.76*	*1.63*	*1.75*	*1.27*	*1.51*	*2.00*	*1.38*
	High	*4.05*	*9.40*	*2.86*	*2.51*	*1.52*	*3.16*	*2.89*
Chloride (mg/L)	*Low*	*3.28*	*3.31*	*3.32*	*3.26*	*3.40*	*3.30*	*3.30*
	High	*4.80*	*4.54*	*4.05*	*4.65*	*5.04*	*5.10*	*4.29*
Turbidity (NTU)	*Low*	*1.32*	*1.46*	*1.33*	*0.93*	*0.66*	*1.09*	*1.11*
	High	*4.99*	*2.06*	*1.62*	*2.01*	*2.30*	*3.24*	*2.76*
Hardness	*Low*	*32.5*	*31.6*	*31.9*	*32.5*	*32.2*	*16.6*	*32.8*
	High	*42.5*	*42*	*35.7*	*41*	*44.3*	*36.4*	*40*
Total Alkalinity (mg/L)	*Low*	*38*	*33*	*35*	*37*	*38*	*40*	*41*
	High	*52*	*48*	*42*	*48*	*47*	*50*	*46*
Ammonia as N (mg/L)	*Low*	*0.09*	*0.09*	*0.15*	*0.09*	*0.39*	*0.21*	*0.12*
	High	*0.12*	*0.18*	*0.15*	*0.09*	*0.39*	*0.21*	*0.12*
Nitrate as N (mg/L)	*Low*	*0.22*	*0.20*	*0.22*	*0.24*	*0.32*	*0.23*	*0.26*
	High	*0.30*	*0.49*	*0.47*	*0.49*	*0.47*	*0.32*	*0.35*
Nitrite as N (mg/L)	*Low*	*0.009*	*0.009*	*0.009*	*0.009*	*0.006*	*0.006*	*0.006*
	High	*0.009*	*0.012*	*0.021*	*0.049*	*0.018*	*0.012*	*0.012*
Orthophosphate as P (mg/L)	*Low*	*0.016*	*0.010*	*0.009*	*0.008*	*0.009*	*0.013*	*0.008*
	High	*0.016*	*0.016*	*0.015*	*0.020*	*0.016*	*0.016*	*0.016*
Fecal Coliform (MPN/100ml)	*Low*	*1.0*	*1.0*	*1.0*	*1.0*	*2.0*	*1.0*	*4.0*
	High	*1.0*	*1.0*	*1.0*	*7.5*	*19.2*	*9.9*	*12.4*

7. Water chemistry taken as part of the Kern Canyon Project, FERC No. 178, in 2002 by Pacific Gas and Electric Company sampled roughly a quarter mile upstream of the Forest boundary along the Lower Kern River. Samples were taken at the diversion dam forbay, end of project bypass reach, and 200 yards downstream of the powerhouse tailrace; summer and winter, 2001 and 2002. All pH measurements meet water quality objectives and fall within state standards. Table 8 provides results of the sampling for Kern Canyon Project, FERC No.178 *(Source: PG&E license application, as modified by staff).*

Table 8. Kern Canyon Project, FERC No.178.	**Diversion Dam Forbay**		**End of Project Bypass Reach**		**200 Yards Downstream of Powerhouse Tailrace**	
Date	Summer	Winter	Summer	Winter	Summer	Winter
	8/15/2001	1/31/2002	8/15/2001	1/31/2002	8/15/2001	1/31/2002
pH value	8.3	7.8	8.3	8.0	8.1	7.9

8. Fire History in the Lower Kern River basin would have affected water quality parameters during the time of water quality sampling. The water quality sampling period of February 2002 to May 2004 includes numerous wildfires that affected water quality within the Kern River Basin. During this period the largest wildfire that

affected the area was the McNally fire. This fire burnt roughly 150,000 acres during July and August of 2002 in the North Fork Kern River basin, and the effects of the fine sediment that included ash was noticed for the next three years as documented at the Kernville Fish Hatchery. Three years after the fire the fish hatchery still had problems with their ponds filling up with ash and sediment.[28]
The Borel fire, 3,430 acres burned in the summer of 2002 and burned from below Isabella Dam at Borel Power House to the Lake Office. A total of 168,014 acres burned from 2002 to 2004 adjacent or upstream of Lake Isabella and Kern River. A table of fire events and size are displayed in enclosure 1. Ash from the fire would have been directly deposited into Lake Isabella and Lower Kern River. Impacts associated with these wildfires could be responsible for changes in pH as values from water board monitoring efforts do not seem consistent with those taken before and after this time frame. It is expected that ash could increase pH values. Additionally sediment releases from Lake Isabella could also affect pH values in the Lower Kern River. Currently listing the North Fork Kern River, Lake Isabella and Lower Kern River waters based on pH values collected from the time period of 2/2002 to 5/2004 could be considered indicative of a temporal trend.

9. Riparian grazing allotment transects monitoring data collected at North Fork Kern River, South Fork Kern, and Lower Kern River sites collected between 2000 and 2007. The purpose of the US Forest Service Region 5 Range Monitoring Project is to establish permanent plots on key range sites across National Forest lands in Region 5 in order to provide long-term monitoring of range condition. Each site will be reread after five years. In addition, the project is designed to provide an ecological classification (vegetative, soils, and hydrologic) and quantitative condition scorecards for meadows. These products are intended for use by range conservationists, wildlife biologists, hydrologists, soil scientists, and fisheries biologists in inventorying and assessing meadow conditions.[29] Enclosure 5 provides data collected for the Range Monitoring Program in watersheds that have the potential to affect the Lower Kern River.

Deer Creek, Tulare County

This water segment as identified by the Board as starting somewhere around Pixley, Ca and proceeding to the headwaters on the Sequoia National Forest. Sampling that placed Deer Creek for consideration to the 303(d) lists are at seven sites along the reach. None of these sites are on National Forest Lands and *the nearest sample site is 17 miles downstream of the Forest boundary. Deer Creek is crossed by Highway 65, Highway 99, and Highway 43 and flows through agricultural lands, range lands, and communities once it leaves the Forest.*

The source of the pH is stated as unknown. Findings of the sampling indicate pH values range from 6.85 to 8.79. Toxicity data was not included in the documents provided for public review. The source of the unknown toxicity is stated as unknown. *It is impossible for the Forest to comment on this data set other than to suggest it is so far from and downstream of the Sequoia National Forest Boundary and conditions are so different that the information is not applicable to the Forest.* The location of the nearest site is 17

[28] http://www.kvsun.com/articles/2006/10/05/news/04hatchery.txt

[29] USFS Region 5 Range Monitoring Project, 2006 Report, by: Dave Weixelman, Range Ecology, U.S. Forest Service, Nevada City, CA , April 27, 2007, http://fsweb.r5.fs.fed.us/unit/nrm/range/monitoring/2006_R5_range_monitoring_rpt.pdf

miles downstream from the Forest boundary and has pH values of 7.37-8.2 which are within the range set for water quality standards. Acceptable pH ranges are 6.5 to 8.3. Beneficial use for Deer Creek is stated as Warm Freshwater Habitat in Appendix F, Supporting Information, Draft 2008 California 303(d)/305(b) Integrated Report, Deer Creek, Decision ID 13090, Unknown Toxicity and ID 13088, pH. Enclosure 1 provides maps and details obtained from the Central Valley Water Quality Control Board on sampling locations and sampling results.

Based on the location and extent of this reach the Forest Service feels it is inappropriate to list the segment of the Deer Creek on National Forest Lands. With the objective of basing listings on the most current and accurate information, the Forest offers the following information on conditions in Deer Creek:

1. The USFS manages approximately 31 square miles of the Deer Creek Watershed as part of the Sequoia National Forest. A primary objective of the USFS in managing our portion of these lands is to improve and protect watershed conditions (USDA Forest Service Strategic Plan, 2007). The USFS recognizes its responsibilities to protect water quality and supports the efforts of the Regional Board to enforce the Clean Water Act and the California Water Code through revision of its 303(d) list of impaired water bodies.
2. None of the sites sampled for pH and unknown toxicity are on National Forest Lands and the nearest site is 17 miles downstream of the Forest boundary. Upstream of this sampling site Deer Creek is crossed by Highway 65, Highway 99, and Highway 43 and flows through agricultural lands, range lands, and communities once it leaves the Forest.

3. The Forest feels the listing of Deer Creek 17 upstream of a sampling station that shows no violation of the state pH standard (7.37-8.2) as arbitrary. Furthermore pH values taken on Sequoia National Forest provide values that meet state water quality standards. See items 4 and 5 below.

4. The Forest has been monitoring water quality on National Forest Lands for years. The Forest has fisheries inventories and channel stability data that go back to the early 1970s. Policy directs the Forest to investigate macroinvertebrate and stream condition inventories prior to any ground disturbing activity.[30] The Forest has extensive surveys in the Deer Creek watershed which includes physical, chemical, and biological data. Roughly 33 miles of stream tributary to and including Deer Creek have been surveyed for Fisheries Habitat and Stream Stability since 1971. Streams surveys for Deer Creek drainage follow Stream Condition Inventory Protocol. These surveys provide chemical, physical, and biological data. Evaluation of pH provides a value of 7.5 in 2006 and 7.3 in 2007. Aquatic insect data collected in 2006 indicate that there is no apparent organic pollution. Table 9 provides a summary of data collected at Levis Flat Campground located on Deer Creek.

Table 9 Summary of SCI Data from Deer Creek, Tulare County, California					
Name	**Location**	**pH**	**Hilsenhoff**	**Date**	**UTM**

[30] Sierra Nevada Forest Plan Amendment, USDA Forest Service, United States Department of Agriculture, Forest Service, Pacific Southwest Region January 2001 and January 2004.

			Aquatic Insects	Collected	
Deer Creek	Levis Flat Camp Ground	7.5	3.49 No apparent organic pollution	7/19/2006	11S 0348884 3971701
Deer Creek	Levis Flat Camp Ground	7.3	None collected	12/3/07	11S 0348884 3971701

5. Most recent investigation of Deer Creek was on November 6-7, 2007 for renewal of recreation residence contracts. During field investigations the following water chemistry measurements were taken in Deer Creek, SFMF Tule River, and White River. All the sampled rivers are within state water quality standards. Table 10 displays results of water quality sampling for relicensing of recreation residences in 2007.

Table 10. Water Quality Sampling for Recreation Residence Relicensing, 2007	**Deer Creek**	**Tule River (SFMF)**	**White River**
Alkalinity	64 ppm of CaCO3	62 ppm of CaC03	40 ppm of CaCO3
Dissolved Oxygen	9.1 ppm	10 ppm	9.2 ppm
pH	7.3	7.5	7.3
Nitrates	0 ppm	0 ppm	0 ppm
Nitrites	0 ppm	0 ppm	0 ppm

6. Base on Forest Fisheries data Deer Creek is a Class I stream that supports a population of rainbow trout and thus would be considered a Cold Water Fishery.

Hume Lake

This water segment as identified by the Board appears to include Hume Lake to Hume Dam. Lake elevations are estimated to be approximately 5,200 feet above sea level. Sampling that placed Hume Lake for consideration to the 303(d) lists are at four sites along the lake. The location of these sites are Hume Dam, Ten Mile Creek, Long Meadow Creek, and at the Pier below Long Meadow and Ten Mile Creeks. Sampling occurred for $2^1/_2$ years from 2002 to 2004. Findings of the sampling indicate DO value range from 5.47 to 14.3. Acceptable DO are 7 mg/l and above. The source of the DO is stated as unknown. Beneficial use for Hume Lake is stated as Cold Freshwater Habitat in Appendix F, Supporting Information, Draft 2008 California 303(d)/305(b) Integrated Report, Hume Lake, Decision ID 15948, DO sections. Enclosure 1 provides maps and details obtained from the Central Valley Water Quality Control Board on sampling location and sampling results.

Based on the location and extent of this reach the Forest Service feels it is inappropriate to list Hume on National Forest Lands. With the objective of basing listings on the most current and accurate information, The Forest offers the following information on conditions in the watershed surrounding Hume Lake:

1. The U.S. Department of Agriculture Forest Service (USFS) manages approximately 24 square miles of the Watershed draining into Hume Lake as part of the Sequoia National Forest. A primary objective of the USFS in managing our portion of these lands is to improve and protect watershed conditions (USDA Forest Service Strategic Plan, 2007). The USFS recognizes its responsibilities to protect water quality and

supports the efforts of the Regional Board to enforce the Clean Water Act and the California Water Code through revision of its 303(d) list of impaired water bodies.

2. The Forest has been monitoring water quality on National Forest Lands for years. The Forest has fisheries inventories and channel stability data that go back to the early 1970s. New policy directs the Forest to investigate macroinvertebrate and stream condition inventories prior to any ground disturbing activity.[31] The Forest has extensive information along streams that flow into Hume Lake which includes physical, chemical, and biological data. Roughly 17 miles of stream that flow in to Hume Lake have been surveyed for Fisheries Habitat and Stream Stability since from 1989 to 1996. Enclosure 2 provides a summary of all streams surveyed on rivers that drain into Hume Lake following Stream Condition Inventory Protocol. These surveys provide chemical, physical, and biological data. Evaluation of pH values from these surveys show a pH range of 6.7 to 7.0 on streams surveyed from 2002 to 2007.
3. Hume Lake is an artificial reservoir that contains rainbow trout, brown trout, smallmouth bass, and green sunfish. The lake is stocked with rainbow trout periodically by the California Department of Fish and Game during the summer. At over 5,000 feet in elevation the lake is within in Moyle's "rainbow trout zone," despite the presence of warmer water centrachids (bass and sunfish). However, due to limited depth it is subject to increased summer temperatures which provide habitat for both cold and warm water fishes. The Forest would like to see a designation of warm fresh water habitat placed on this water body.

4. Hume is a manmade lake; this lake is a known sediment trap and sediment accumulation and water depth are known issues. DO is a function of temperature. It is assumed that DO levels are a function of lake temperatures which is a function of water depth and time of year. If a designation of warm fresh water were recognized for Hume Lake, a beneficial use much more appropriate for existing habitat conditions, DO would not be an issue. More information needs to be gathered to determine relationships and solutions to maintain DO levels.

5. Riparian grazing allotment transects monitoring data collected at Horseshoe Meadow site collected between 1999 and 2004. The purpose of the US Forest Service Region 5 Range Monitoring Project is to establish permanent plots on key range sites across National Forest lands in Region 5 in order to provide long-term monitoring of range conditions. Each site will be reread after five years. In addition, the project is designed to provide an ecological classification (vegetative, soils, and hydrologic) and quantitative condition scorecards for meadows. These products are intended for use by range conservationists, wildlife biologists, hydrologists, soil scientists, and fisheries biologists in inventorying and assessing meadow conditions.[32] Enclosure 5 provides data collected for the Range Monitoring Program in Horseshoe Meadow which has the potential to affect Hume Lake.

Summary and Proposal for a Partnership

[31] Sierra Nevada Forest Plan Amendment, USDA Forest Service, United States Department of Agriculture, Forest Service, Pacific Southwest Region January 2001 and January 2004.

[32] USFS Region 5 Range Monitoring Project, 2006 Report, by: Dave Weixelman, Range Ecology, U.S. Forest Service, Nevada City, CA , April 27, 2007, http://fsweb.r5.fs.fed.us/unit/nrm/range/monitoring/2006_R5_range_monitoring_rpt.pdf

In summary, the Forest would like to reiterate that water quality on the National Forests in California has been protected since 1981 through a Management Agency Agreement (MAA) between the State Water Resources Control Board (State Board) and the USFS. This MAA provides for a USFS Water Quality Management Program (WQMP) that is based on Best Management Practices (BMP's) developed for a wide variety of USFS resource-management activities. These BMP's were certified by the State Board and approved by the U.S. Environmental Protection Agency (USEPA).
The State's Policy for Implementation and Enforcement of the Nonpoint Source Pollution Control Program (2004) supports the use of BMP's and MAA's as the primary mechanisms for meeting water quality standards on public lands. As described in this policy, successful MAA's are more efficient that direct regulation by the Regional Boards, limit unnecessary duplication of effort, and leverage limited staffing and financial resources.

Documented in this letter is evidence in the form of sampling, survey results and monitoring that:

1. Indicate the water bodies being considered for 303(d) listing are not in impaired conditions within the Sequoia National Forest Boundaries;
2. Our Best Management Program Effectiveness Program monitoring indicate high levels of BMP implementation and effectiveness for the entire Forest; and
3. The proposed listing would affect headwaters of watersheds that are primarily within Sequoia National Forest boundaries.

The Forest would request that listings be limited to reaches downstream of the Forest Boundary based on criteria listed above.

If the Water Board determines any of the proposed water bodies on National Forest Lands are to be listed, the Sequoia National Forest respectfully requests that an alternative to TMDL be proposed. It would be improbable, if not impossible, to achieve TMDL load allocations for nonpoint source pollution as the Forest has reason to believe impairments identified have not been affected by management activity nor could they be address through management actions.

The Forest maintains that alternative to listing could be accomplished by the proposed TMDL completion date of 2021 if the Sequoia National Forest proposed a partnership with the Central Valley Water Quality Control Board, United States Geological Survey, and California State University, University of California, or similar College/University systems in addition to other agencies with programs affected by a 303(d) listing within the proposed watershed or that could support the effort.

For water bodies that are added to the State's 303(d) list, the State's Water Quality Control Policy for Addressing Impaired Waters: Regulatory Structures and Options (2005) allows Regional Boards to certify non-regulatory programs of other entities as appropriate TMDL implementation. The 2007 Memorandum of Agreement between the USFS and the U.S. Environmental Protection Agency (Enclosure 6) encourages the use of Category 4b in place of TMDL implementation plans for 303(d) listed water bodies on or downstream of national forest lands if proper implementation of preventative and

restorative BMP's can reasonably be expected to achieve Basin Plan water-quality objectives. For Category 4b to be employed, the following conditions must be met:

1. Sources of pollution must be identified and the general treatments determined. The treatments must be designed to achieve State and Basin Plan water quality objectives. While the sources are stated as not identified in Appendix A, (Proposed Changes to the 303(d) List, CVWQCB Clean Water Act Section 305(b) and 303(d) Integrated Report for the Central Valley Region, January 2009 Public Review Draft), conversations with your staff suggest some of this information is available. Furthermore, it is our contention that the sources either are anomalous, as in the case of the McNally and Borel wildfires that took place during the sampling period; are from anthropogenic causes such as geochemical reactions associated with faulting; or are from sources downstream of Forest boundaries.

2. A watershed-specific monitoring plan must be provided that identifies the current condition and the target conditions that will indicate compliance with Basin Plan objectives.

3. A realistic, aggressive schedule for implementing restoration BMP's based on currently available or reasonably foreseeable funding must be provided.

4. If monitoring indicates that recovery is slower than expected, an iterative cycle of more effective treatments will be applied until recovery goals are met.

5. The Regional Board retains the authority to revert to Category 5 if for any reason achievement of state or basin water-quality objectives appears to be unlikely.

Although Category 4b is likely to be more cost-effective than traditional TMDL development, it has not, to my knowledge, been used previously in California. The Sequoia National Forest welcomes an opportunity to work with the Central Valley Water Quality Control Board to develop a precedent for this approach to improving water quality on national forest system lands.

Sincerely,

/s/ Jim Whitfield (for)
TINA J. TERRELL
Forest Supervisor

Enclosures