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April 29, 2008

AB 2121: Draft Policy for Maintaining In-stream Flow in Northern California Coastal Streams

Dear Ms Niiya:

The Draft Policy for Maintaining In-stream Flow in northern California Coastal Streams (the "Draft Policy") defines a methodology for calculating in-stream flows and outlines prescriptive requirements for water diversions. The policy applies to pending water rights applications in Sonoma, and parts of Marin, Mendocino, Napa, and Humboldt Counties. The majority of pending water right applications are in Mendocino and Sonoma counties.

The Draft Policy requires that each applicant prepare a water supply report, determine the upper limits of anadromy for the affected creek and prepare an instream flow analysis report. The Draft Policy focuses on eliminating detrimental effects of water diversions on the in-migration and spawning stages of the salmonid lifecycle.

Our organization, the California Land Stewardship Institute, runs the Fish Friendly Farming Environmental Certification Program in Mendocino, Sonoma, Napa, and Solano counties. Over 80,000 acres of agricultural lands are enrolled in our program. Our staff works with farmers throughout these counties and assesses and evaluates agricultural lands, stream habitats, hydrology, water supply, water and soil conservation practices, and other features. We have reviewed the location and operation of over a hundred reservoirs and water diversions and are very familiar with the conditions in these watersheds. Our staff also completes numerous road, erosions control, water conservation and stream restoration projects. Based on our observations, experiences, and analyses in these watersheds, we offer the following comments on the Draft Policy.

1. Many Causes of Fish Decline

The Draft Policy recognizes that habitat for anadromous fish in these watersheds is affected by many land uses and land management practices. The pending water rights that are the subject of this policy are one of many the land uses with effects on streams. However, none of the major changes in these watersheds resulting from land use and development are considered in the application of the policy. These changes include construction of six very large on-stream reservoirs (Lake Mendocino, Lake Sonoma, Milliken Reservoir, Lake Hennessey, Bell Canyon Reservoir and Rector Reservoir) which have significantly altered downstream creek and river channels.

2. Natural Geologic and Topographic Features Affect Stream Flows

The five-county area where the Draft Policy applies has varied geology and topography; however, the proposed methodology for evaluation of in-stream flows does not incorporate these varied conditions and therefore could result in no positive improvements for in-stream flows.

For example in the Napa Valley many streams which originate in the mountains along both the east and west sides of the valley flow through alluvial fans in the valley before reaching the Napa River. These streams include Ritchie, Bear/Bale Slough, Dry, Selby, Rector, Soda Canyon, York, Mill, Sulphur, and Milliken Creeks. These alluvial fans are made up of boulders, cobble, and gravel and are very porous. Stream flows infiltrate into the fan, recharging groundwater in the fall and early winter. Connected stream flows between the mountains and the river do not occur until groundwater levels are high and flows in the main river channel rise. In the 2007/2008 winter season the first connected flows occurred in January on five streams that we monitor.

Recent work by the San Francisco Estuary Institute documenting the historical ecology of streams in the Napa Valley from the 1800's shows discontinuous surface flows in these creeks where flows become subterranean through alluvial fans between the mountains and the main river. It is a natural condition in the Napa River watershed for connected surface flows to be limited in timing and location by the existing geologic and topographic features regardless of water diversions. Natural geologic conditions which create alluvial fans typically occur where mountains flanking a valley are rising and the valley is dropping due to tectonic activity. The Ukiah, Alexander, Russian River, Knights, and Napa valleys, as well as many other locations, have these geologic conditions.

The methodology proposed in the Draft Policy does not address geologic and topographic features. The Draft Policy uses an assumption that if bypass features are installed on small diversions and reservoirs, there will be connected flow downstream to allow salmonid in-migration and spawning. It is quite possible that there will be no actual difference in the timing of connected stream flows between mountain reaches of streams and the rivers in these valleys if bypasses are installed on upstream reservoirs, or if reservoirs operate as fill and spill facilities. A watershed based analysis is needed to evaluate the effects of pending rights on actual stream flows.

3. Effects of Large Reservoirs on Downstream Channel

Downstream of the very large reservoirs the timing of connected tributary stream flows is highly affected by releases from the large reservoirs. For example, Coyote Dam on the Russian River in Ukiah was completed in 1959 and has caused significant downcutting and entrenchment of the Russian River channel. Below the dam the river channel bottom has dropped over 20 feet through erosion of its alluvial bed and banks as a result of the dam impairing sediment supply. This entrenchment in the main river channel has progressed up many tributary streams, eroding out gravel and undercutting riparian trees. Every bridge over a creek or river channel within a 10-mile radius of the Coyote Dam has been undercut and required replacement or retrofitting. Migration barriers for steelhead trout have been created through the entrenchment of the main river and its progression up creek channels.

Another change caused by this downcutting in the main river channel is a drop in the groundwater level. Groundwater in the unconfined aquifer of the valley alluvium drains to the elevation of the bottom of the river channel. In the fall/early winter the water surface elevation of the river largely defines the groundwater level in the alluvium.

In 2001/2002 our executive director working with landowners and the Regional Board conducted an experiment on Morrison and Parsons Creeks in the Ukiah Valley. The creeks exit the Maacamas Mountains on the east side of the Ukiah Valley and course through alluvial fans to the Russian River. A series of shallow groundwater wells were installed in the alluvial reach of each creek and a channel survey was conducted. The water level in each well was monitored weekly as was the presence of surface flows. Once the water level in the Russian River was lowered as part of the transition from flood control to water supply operations, the groundwater levels in the two creeks rapidly dropped. Surface and groundwater levels in both creeks dried up at the confluence with the Russian River first; later, levels dropped upstream. This experiment demonstrated that the water release operations of Coyote Dam have a great effect on surface flows in these two alluvial creek channels during spring when rainfall is infrequent. We would expect this same condition to occur in fall/early winter unless rainfall amounts are great.

For the streams flowing from the mountains on the east and west sides of the Ukiah Valley, stream flows will infiltrate into the alluvium until the river flows come up from reservoir releases and/or rainfall. Bypassing flows around small reservoirs and diversions in tributary watersheds is not likely to create connected stream flow and allow in-migration of salmonids unless the river flows are also managed to for this purpose. Currently, the Coyote Dam is not managed for the benefit of salmonid migration or spawning but instead during the October-April period is managed as a flood control reservoir. During the 2007/2008 year it was not until January that connected stream flows occurred in most streams in the Ukiah Valley. This was largely due to the low level of Lake Mendocino following the dry 2006/2007 water year and management of the reservoir to impound all stream

flows until the lake has refilled. This large reservoir is not subject to bypass requirements and is not managed for downstream fishery benefits, yet its operations has enormous effect on the flows in downstream tributary streams. Unless the operation of Coyote Dam is changed, imposing bypasses on small reservoirs and diversions will not likely create improved flow conditions for fish in-migration and spawning. The policy needs to recognize this limitation on the Russian River and define variances to address different bypass conditions consistent with actual stream flow conditions in the river and its tributaries.

Channel entrenchment of the main river channel is prevalent on the other alluvial reaches of the Russian River in the Alexander and Russian River valleys, and in the Napa River. This condition likely also affects the timing of connected stream flow in the fall/early winter period and thus the effectiveness of requiring bypass facilities on small reservoirs and diversions in tributary watersheds.

4. Bypass Channels May Have No Benefit In Many Streams

Given the actual conditions prevalent in the Russian and Napa River watersheds, it is questionable whether there will be any benefit to salmonids from bypass channels constructed on small reservoirs in tributary watersheds. The policy needs to incorporate actual conditions in these drainages, not assume a set of physical conditions. We would recommend that the requirement for constructed bypasses on all existing fill and spill reservoirs be revised to a requirement only when existing physical geologic, topographic and river channel conditions and operations demonstrate that a bypass will create flows for in-migration and spawning. There are many other types of improvements which can be done on creeks in these watersheds to benefit fish that will be precluded by a requirement for expensive bypass facilities.

5. Gravel Augmentation

The provisions in the policy for gravel augmentation, riparian revegetation and wood augmentation need to be evaluated in a watershed context. These actions would be unnecessary on creeks such as alluvial fan channels where riparian vegetation does not grow in the same pattern or density as on valley creeks. Augmenting gravel in channels affected by entrenchment in the main river channel will only result in the movement of that gravel into the river. In the 1990's an experiment was done by the Mendocino Water Agency on Forsythe Creek a tributary to the Russian River in Mendocino County when 5,000 cubic yards of gravel placed in the creek was moved out of the creek channel in a 2-year frequency storm. Gravel augmentation may have benefits for streams that are more remote from the main river in the Russian and Napa River watersheds and those which are not incised and therefore do not have as high velocity flood flows.

6. Watershed Alternative

With the existing flow impairments caused by the entrenchment of the main Russian and Napa rivers, release operations by large main stem reservoirs and natural geologic and topographic limitations to connected stream flow, a watershed-based methodology is needed. Many of the farmers in the FFF

program have pending rights applications and are working with us to formulate pilot watershed projects. Our organization is also currently working with the Farm Bureau and Wine Institute in developing a watershed-based hydrologic and geomorphic analysis of a number of tributaries in the Russian River in Mendocino County and the Napa River in Napa County including the development of pilot projects. The pilot projects would provide documentation of actual flow conditions to use in evaluating the effects of pending applications on the timing and volume of instream flows, measures to provide necessary bypass flow levels and to determine other methods to implement improved fish habitat conditions for in-migration and spawning.

The methodology involves:

A. Tributary streams in the Mendocino Russian River and Napa River watersheds will be evaluated for the number and volume of pending and licensed rights; geologic, topographic, and hydrologic features; existence of stream flow gaging data, rainfall gaging data, channel topographic surveys and other applicable data sets; proximity to a stream flow gage on the main river, and land use and vegetation type in the tributary watershed and properties enrolled in the Fish Friendly Farming program. This step is being done using a Geographic Information System (GIS). From this broad-based analysis a set of pilot tributaries will be established to represent a variety of watershed conditions.

B. The Fish Friendly Farming Program already involves numerous farmers in the area where the policy applies as well as agencies. In conjunction with the Farm Bureau, Wine Institute, and other agricultural groups, we will complete pilot watershed analyses with farmers. Our organization has a unique relationship with farmers as we work closely with individuals and build trust. There are individual growers we have worked with for over 10 years to implement their farm conservation plan and fulfill their certification. Through the Fish Friendly Farming program we have a large number of pending rights holders enrolled and all are interested in resolving their water rights status. The FFF program offers significant advantages for these pilot projects as our program assesses numerous features which are important to all life stages of the salmonids, but do not directly relate to water diversion. These features include the condition of the drainage network and need for erosion control and revegetation on both hillside creeks and blueline streams, a complete sediment source inventory and soil conservation program, chemical use and water conservation measures. On these properties any instream flow changes would be accompanied with a suite of restoration and management practices that also benefit the fish. The FFF program is currently being reviewed by the State Water Board as an implementation program for the Napa River Fine Sediment TMDL. As part of the pilot watershed project we would coordinate closely with the State Water Board, NOAA and CDFG.

C. Design a program of data collection. We have outlined the technical approach and methodology for the watershed alternative in Attachment 1. We would complete the data collection and modeling on a number of

tributary watersheds to evaluate what will and will not produce fall/early winter connected stream flows and the velocity and volume of flow needed for salmonid spawning as described in the Draft Policy. The watershed methodology would include preparation of the required elements of the Draft Policy including water supply report, upper limits of anadromy, instream flow analysis and other site specific studies will be included in the watershed alternative. We will work with professionals with experience in hydrologic and hydraulic modeling for in-stream flow analysis and coordinate closely with the agencies.

D. The watershed alternative allows for a broader application of the principles which guide the Draft Policy including minimizing the cumulative effects of diversions on fish and aquatic habitats, limiting the maximum rate of water diversion to avoid adverse effects on stream channel geomorphic processes, limiting the timing and volume of diversions to avoid impacts to immigration and spawning of adult salmon and other stages in the salmon life cycle and avoid new on-stream dams.

E. We would also like to try to use the pilot projects to formulate a method for evaluating diversions for the Fish Friendly Farming program. We would be able to assist numerous growers in implementing need changes for pending rights in order to move forward in a manner that protects fish.

We believe that by evaluating instream flows in a real world context, we can better determine how to revise diversions to produce the conditions needed for salmonid habitat. We will also be able to demonstrate other changes that need to be made to the larger watershed and river channel/ large reservoirs.

If you have questions regarding our comments please contact our Executive Director, Laurel Marcus at the number above. Thank you.

Sincerely,

Beverly Wasson

Beverly Wasson
President, Board of Directors

ATTACHMENT 1
FISH FRIENDLY FARMING ENVIRONMENTAL PROGRAM
WATERSEHD-BASED STREAMFLOW ANALYSIS

1. Drainage Characterization

The rainfall and geologic and topographic characteristics of a watershed combined with land use/management and vegetative cover largely define stream features. Therefore the first step is to create a GIS for the drainage. The boundaries of the watershed need to extend from the top of the ridge to the confluence of the tributary with the main river channel. Basic data layers for topography, steams, detailed geologic mapping, soils, vegetative cover, land use, roads both public and private, existing reservoirs and diversions, shallow wells, stream flow gaging stations, rainfall stations, previously completed restoration projects and any fisheries or habitat studies and fish barrier inventories would be collected. Most of the readily-available GIS layers such as the CalVeg layer have a coarse resolution of 30 meter/pixel such that features like riparian vegetation along streams are not captured. There may be site specific stream corridor mapping for some areas.

The GIS should also have a layer for all existing water diversions including riparian rights as well as the pending applications with the attributes of each diversion, total volume and season and method of diversion, noted.

2. Reconnaissance of Basin

Since it is unlikely that GIS layers will exist for the condition of the channels and other features of the basin, a field assessment is needed. For alluvial reaches stream channels will be evaluated for entrenchment, alluvial fans, aggraded areas and the features at confluences with tributary creeks and the main stem river. Some channel surveying may be completed. As part of the reconnaissance potential stream flow stations would be evaluated. An emphasis will be placed on geomorphic analysis and characterizing channel reaches by the dominant geomorphic process, not a static channel classification system. Confined channels will also be evaluated for morphological features and slope.

As part of the reconnaissance fish habitat surveys would be used to evaluate spawning and rearing habitat areas, the presence or absence of salmonids and necessary stream flows for these areas to be used. The fish habitat surveys would be conducted by a qualified fisheries biologist. In general, the stream flow criteria for spawning used in the Draft Policy of 1-2 ft./second velocity will be used.

3. Collect Necessary Site Specific Measurements

GIS information typically is not adequate for analysis of instream flows. Synoptic sampling of stream flows at numerous locations in a watershed provides the best real-time data for actual conditions. A number of stations would be identified for the

installation of pressure transducers to measure stream flows. These stations would be set up during the dry season and field measurements completed. A number of automated rainfall gages would also be installed in the drainage if needed.

These types of gages will record information and store it, but require constant oversight. The stream flow gages also require field measurements of stream flow to properly interpret the gaging data.

These gaging stations would be distributed in the watershed to record the timing of initiation of stream flow and duration, volume, depth and velocity of flow in the upper reaches, lower reaches and confluence with the river channel. This data will characterize the watershed and how the existing natural conditions, existing diversions and river channel entrenchment/reservoir releases affect the timing and magnitude of connected stream flow, particularly in the early winter season.

Shallow groundwater in alluvium next to stream channels, particularly in areas near the river channel should be monitored using piezometers. Shallow groundwater levels near alluvial channels determine when the stream changes from a gaining to a losing reach and connected surface flows occur. Aquifer tests (72-hour pumping tests) may need to be conducted to determine the groundwater flow characteristics of alluvial fans, where seasonal loss of direct flow connection between a tributary and the mainstem of a river are a concern.

The flow in the river will also need to be measured near to the confluence with the creek. A log of the upstream reservoir releases will also be collected.

In order to relate these various measurements the most downstream reach of the creek would be surveyed along with the river channel at the confluence with the stream.

4. Develop and Run a Hydrologic and Hydraulic Model

The Draft Policy requires the preparation of a water supply report, determination of the upper limit of anadromy and preparation of an instream flow analysis for each diversion. The basic reconnaissance and site specific measurements, including the hydraulic conductivity and storativity of alluvial fan material, will allow for a stream flow model to be set up and calibrated for the basin. There are a variety of open access, available models which can be used. This model and the data collection, including field studied by a fisheries biologist, allows for the preparation of these three documents and analysis of the pending applications under the actual watershed conditions. This methodology will allow an analysis of whether a bypass channel will increase the days of connected stream flow or if other processes in the watershed such as river channel entrenchment and low reservoir releases control the timing and duration of connected stream flow. Additionally, this methodology will allow for coordination of diversions if needed to assure adequate flows.

5. Coordination and Decision-Making

The watershed alternative provides a superior level of analysis for evaluating the effects of diversions on aquatic habitats and allows for a focus on the actual limiting factors rather than presumed ones. However, for the watershed alternative to be an effective tool in the water rights process, the government agencies with responsibilities for decision making need to participate in the alternative and use the findings of the analysis. It is untenable for this level of scientific analysis to be completed and then have decisions made using presumed assumptions. To this end a memorandum of understanding with the agencies will be sought to allow several pilot projects to move forward. By starting with pilot projects, the details of this multi-disciplinary approach can be learned and understood by both the agencies and the applicants and any problems in the methodology or needed changes can be worked out.

Additionally, other habitat conditions not related to stream flow such as insufficient riparian shade canopy can be evaluated in the larger watershed context and potentially be remedied through a permit/mitigation program.

Fish Friendly Farming® Environmental Certification Program
Mendocino, Sonoma, Napa and Solano Counties
A project of the California Land Stewardship Institute
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