

**State Water Resources Control Board
Division of Water Rights
Staff Report**

**Assessing Site Specific and Cumulative Impacts on
Anadromous Fishery Resources in Coastal Watersheds in Northern California
January 23, 2001**

Listed below are several factors that are to be evaluated when determining if water development projects have the potential to cause significant effects to the anadromous fishery in Northern California coastal watersheds. These factors will be evaluated for both proposed diversions and existing unauthorized diversions seeking water right permits. The importance of these factors are discussed in detail in reports prepared by State Water Resources Control Board (SWRCB) staff (1) and the National Marine Fisheries Service (NMFS) (2). These factors are to be applied to minor projects as defined by the California Water Code section 1348. (An application not in excess of 3 cfs by direct diversion or in excess of 200 acre feet of storage is considered a minor project). The area specifically evaluated for these factors was the Coastal watersheds (including those tributary San Francisco and San Pablo Bays in the counties of Mendocino, Sonoma, Marin and Napa. These factors with appropriate modification could be applied to areas coastal south of these counties with additional information from State and Federal Fishery agencies.

Migration Barriers

Onstream reservoirs have the potential to block fish passage and negatively affect stream processes needed to maintain healthy habitats for salmonids (e.g., gravel recruitment). The California Department of Fish and Game (DFG) and the NMFS suggest that no existing, unauthorized onstream reservoirs should be permitted and no approvals should be granted for new onstream reservoirs (3). Division staff believes that any project that has blocked or proposes to block spawning migration routes has the potential of causing significant adverse effects on anadromous fishery resources. In order for the Division to continue processing proposed projects that block anadromous fishery migration routes preparation of a detailed environmental review will be required as part of the initial study. The review will either a.) demonstrate that the project will not have a significant adverse effect upon the fishery; or, b.) if there is a significant adverse effect on the fishery. If significant effects are likely, then an Environmental Impact Report (EIR) will be required and the SWRCB will adopt a statement of overriding consideration for those effects that cannot be mitigated and the project is approved. The applicant will be responsible for all costs associated with the preparation of the EIR. The Division will continue to encourage applicants to design their projects for offshore storage.

In most cases existing, unauthorized diversions that block spawning migration routes will require extensive modification to allow for fish migration or they may be required to be removed. During the permit review process, existing unauthorized diversions that have the potential to cause adverse impacts to the anadromous fishery will be treated the same as new proposed onstream projects. Existing permitted conditions (i.e. current environmental conditions that result from the legally permitted aspects of existing projects) will typically be used for the CEQA baseline for evaluation of impacts of the project. If existing unauthorized

projects have caused significant environmental impacts from this baseline, the preparation of an EIR will typically be required if the project proponent wishes to proceed with the water rights process. (The SWRCB has allowed some exceptions under CEQA for ongoing projects that have not expanded water use since 1973 when CEQA was amended to apply to private projects.

Season of Diversion

The 1997 Russian River Staff Report (1) proposed a season of diversion, of December 15 to March 31, based primarily upon hydrologic analysis and life stage evaluation of the anadromous fish species present to avoid adverse environmental impacts. The DFG and NMFS have concurred with this proposed restriction on the season of diversion (3). The peer review of the SWRCB proposal agreed that the season of 12/15 to 3/31 is appropriate for avoiding significant effects on salmonid species (4). Division staff recommends that the restricted season of diversion of December 15 to March 31 be used to prevent further effects on salmonid species during the critical spring, summer, and fall months. The season of diversion for coastal stream projects south of San Francisco Bay will be modified to reflect the run-off patterns and the life stages of anadromous fish in these areas. This modification will be done after contacting the State and federal fishery agencies for their recommendations.

DFG and NMFS recommend that the instantaneous inflow at the point of diversion equal instantaneous outflow to downstream reaches past the point of diversion outside of the diversion season (3). Under the State's water right process, water projects are typically allowed to regulate water for up to 30 days before it is considered storage, thus allowing projects to modify peak flows outside the storage season without violating their water right permit. This 30-day average regulation of flow is a concern for the fishery agencies. Their objectives are to require the natural flow of the stream to be bypassed as it occurs, and for this flow to not be modified by the project outside of the season of diversion and storage. Also, the project should be required to bypass all the flow that occurs during the season of diversion once the project has appropriated the amount authorized. For small impoundment's, this would require flow bypass facilities sized to bypass the instantaneous flows. Instantaneous flows can be quite large and sizing bypass facilities to accommodate such flows can be difficult and in some cases infeasible. Division staff agrees that bypassing flows as they occur is the preferable method of operation for new water rights to the extent this is feasible. However, the Division will evaluate the need for this condition for individual water right applications including existing unauthorized diversions. For existing projects, diversion facilities may have to be retrofit to accommodate these concerns.

During the diversion season, the fishery agencies request that the rate of diversion also be limited. The maximum rate of diversion for direct diversion projects is specified in the water right permit. However, this maximum rate often reflects an average over a period of days. SWRCB standard term 27 allows the averaging of the rate of diversions over 7 days for domestic use, 14 days for hydroelectric power and 30 days for all other uses provided such averaging would not interfere with other rights or conditions protecting instream beneficial uses. The fishery agencies would like standard term 27 to be used only when necessary. In

addition, instantaneous maximum diversion rate for off stream storage should be used for off-stream storage projects (see standard permit term 5j).

Bypass Flow

Bypass stream flows for the protection of fish and fish habitat have been proposed by the SWRCB (1), NMFS (2) and McBain and Trush (6). These proposals were evaluated by a Peer Review Group during 2000 at the request of the SWRCB (4). Due to the uncertainty of setting bypass flows, the Peer Review group recommended using the unimpaired February median flow to establish a bypass flow instead of the 60% of the average annual flow described in the Russian River Report (1) or the 70% of the 1.5-year annual maximum flood event presented by Trout Unlimited (6). The February median flow is often twice that of the 60% of the average annual unimpaired flow, but does vary from watershed to watershed especially in central and south coastal watershed. Division staff believes that even with a higher bypass requirement, sufficient water is typically available for appropriation during the diversion season in many areas. Division staff now recommends using the February median as the bypass flow where needed to protect fish habitat or provide appropriate contributions to fish habitat downstream.

For areas high in the watershed, substantially removed from anadromous fish locations and sustainable habitat for other fish species, the bypass requirements will be based on protection of riparian habitat areas rather than fish habitat.

In small perennial streams where anadromous fish are continuously present, a depth criterion may be appropriate where the median February flow does not provide adequate habitat to protect anadromous fish directly below the point of diversion. Environmental Unit staff or environmental consultant, in cooperation with DFG staff, will be responsible for the determination of when a depth criteria is applicable and for determining the instream flow required to achieve the depth criteria. A determination of the flow requirement will be made utilizing field survey by qualified biologists in cooperation with DFG and NMFS staff.

Cumulative Effects

In order to make a finding of no significant impact to fishery resources; there should be no significant alteration of the natural hydrology of the stream in normal and wetter years. The DFG/NMFS guidelines suggest that a diversion should be operated with a maximum rate of withdrawal that preserves the natural hydrograph with no appreciable diminishment (<5%) in the frequency and magnitude of unimpaired high flows necessary for channel maintenance (e.g., unimpaired flows with the recurrence interval of 1.5 to 2 years) (3).

To avoid significant cumulative impacts, DFG and NMFS guidelines suggest that the cumulative maximum rate of instantaneous withdrawal at the point of diversion not exceed a flow rate equivalent to 15% of the estimated winter 20% exceedence flow for direct diversion and diversion to offstream storage (3). If the project exceeds these criteria both DFG and NMFS suggest a comprehensive evaluation of the possible effects upon fishery resources be

completed. These evaluations typically would take the form of instream flow studies, hydrologic analysis and possibly an EIR.

The existence of authorized onstream storage facilities within a watershed makes the use of the NMFS criteria for the evaluation of cumulative effects impractical. NMFS has indicated that their objective is to protect peak and intermediate flows and preserve the general shape of the natural hydrograph. Subsequently, the SWRCB, DFG and NMFS have been evaluating alternatives to the NMFS criteria that achieve a similar level of protection.

Division staff has been using a graphical comparison of the unimpaired hydrograph and the impaired hydrograph, which incorporates all known diversions within a watershed. This comparison was used to determine the percentage of the reduction of stream flows in the affected watershed. This requires a judgement determination of what percentage of change constitutes a potential significant effect.

Upon further review of alternatives, Division staff has proposed a method to facilitate the evaluation of the cumulative effects of all known projects plus the proposed project. The recommended method incorporates the evaluation of the percentage of reduction of the hydrograph from existing and proposed water development projects during the season of October 1 through March 31 of typical normal water years. In several discussions with NMFS staff, the Division provided a sensitivity analysis of the comparison between the DFG and NMFS recommendation of 15% of the estimated winter 20% exceedance flow and several alternatives. The results of these comparisons suggest that 15% of the 20% exceedance of the winter flow period is closely related to 10% of the average unimpaired runoff that occurs during the winter period of December 15 to March 31.

The Division's approach was developed to make the analysis as simple as possible, but not to compromise NMFS objectives for the cumulative analysis. The Division will provide the information to DFG and NMFS in the water availability analysis for each project under consideration. The water availability analysis will also be incorporated into the CEQA document. The CEQA document will then be circulated for review and comment to DFG and NMFS, as well as all other interested parties.

The initial water availability analysis should identify all of the known and foreseeable future projects that are diverting or plan to divert water from the watershed in question during the winter storage season. The analysis should develop a percentage comparison of the diversions and the unimpaired conditions to determine if the natural variations of the hydrograph are maintained.

The determination of the percentage of the reduction of instream flows takes into consideration all of the impairments that are known to the SWRCB within the watershed in question. The unimpaired runoff will be calculated using the best available information. Staff has been using the rational runoff method or the regional regression method or combinations of both. The Peer Review group summarized several comments received regarding the methods used by the Division to calculate unimpaired runoff and expressed concerns over the use of the rational runoff method (4). The Division has contacted U.S. Geological Survey (USGS) to determine if there is a more acceptable method to calculate unimpaired runoff. Initially USGS also agreed with the Peer Review Group but did not offer

a solution. The Division is attempting to develop a contract to have USGS measure the runoff in small unimpaired watershed(s) and compare the results to calculated runoff using the method describe above. USGS has indicated that this may take one to two years once the contract is in place. Optimistically the data will show a direct relationship between the calculation and the actual measured flows. In addition, The SWRCB staff is working with USGS to improve the methods used to estimate river flows where there are no gauging stations.

The first step in the process of calculating the percent reduction of instream flows is to determine the average unimpaired runoff for the period of October 1 to March 31 at the location where anadromous fish are typically present downstream of the proposed project. The Environmental Specialist assigned to the application or the environmental consultant will provide the location of anadromous fishery spawning in cooperation with DFG staff. This will be based on the best professional judgement and data to reflect the existing conditions to the extent these conditions are affected by legally permitted projects. The effects of existing unauthorized projects will be subtracted to determine the upstream range of anadromy. The downstream area of significant anadromous fish spawning will also be evaluated and the percent of natural flow impairment for this area of the watershed will also be calculated.

The next step is to determine the percentage of the reduction of instream flow at these locations from existing and the proposed water development projects upstream, during the same period of time (October 1 to March 31). If the percentage of the reduction of instream flows exceeds 10% of the estimated average winter season unimpaired runoff, the cumulative impact to the anadromous fishery will be considered potentially significant and further environmental evaluation will be required.

If the cumulative percentage of reduction of instream flow is less than 5%, then no further cumulative analysis of instream flow is required. If the percentage is between 5% and 10%, a more detailed analysis is required to demonstrate the effects of the project on the natural hydrograph. This will require a graphic display of the effects of all existing and pending diversions for three representative normal years. This display will be for the period October 1 to March 31 for the areas (1) representing the typical upstream range of anadromous fish downstream of the proposed project and (2) the lower range of important fish spawning. The hydrographic display will show the estimated winter daily flows for the years selected under unimpaired and impaired conditions. This will require staff to make reasonable assumptions related to how existing and proposed projects will likely operate. These assumptions will be clearly summarized in the analysis. For reference purposes, the analysis will also show the February median flows and the annual 10% exceedence flows. These hydrographic displays will be used by the environmental staff to determine if peak flows are protected and that the general shape of the natural hydrograph is preserved. These hydrographs will also be included in the environmental document that is prepared. In addition, hydrographs for two representative dry water years (lower quartile years) will be prepared and sent to the NMFS staff for their review. It is anticipated that during wet years there will be less than significant effect upon the natural hydrograph from diversions that total less than 10% of the average water year runoff

If the reduction of instream flow for normal years is more than 10% of the average unimpaired flow, then the cumulative effects will be considered potentially significant. If the

applicant wishes to continue with the proposed project, then they will be responsible to demonstrate to the Division that the proposed project will have a less than significant effect upon the environment or document the extent of these impacts. This will likely require comprehensive fishery and hydrologic analysis. If the analysis indicates a potential for significant environmental impacts then an EIR will be prepared at the applicant's expense, which incorporates the supporting studies and documentation and recommend mitigation measures where feasible.

Key Reference Documents

1. State Water Resources Control Board, Division of Water Rights. 1997. *Staff Report Russian River Watershed*. August 15, 1997.
2. National Oceanic and Atmospheric Administration, National Marine Fisheries Service. 2000 *Additional Staff Analysis of: The State Water Resources Control Board (SWRCB) Staff Report on Proposed Actions to be Taken on Pending Water Right Applications Within the Russian River Watershed (SWRCB document dated August 15, 1997) and Recommended Guidelines for Protecting Instream Flows for Anadromous Salmonids in Tributaries of the Russian River*. (Draft) January 10, 2000.
3. California Department of Fish and Game and the National Marine Fisheries Service. 2000 *Guidelines for Maintaining Instream Flows to Protect Fisheries Resources Downstream of Water Diversions in Mid-California Coastal Streams*. (Draft) May 22, 2000.
4. Moyle, Peter B., Kondolf, Mathias G. with technical assistance from Williams, John G. 2000. *Fish Bypass Flows for Coastal Watersheds, A Review of Proposed Approaches for the State Water Resources Control Board*. June 12, 2000.
5. McBain and Trush and Trout Unlimited. 2000. *Allocating Stream flows to Protect and Recover Threatened Salmon and Steelhead Populations in the Russian River and other North Coast Rivers of California*. (Draft) July 10, 2000.
6. McBain and Trush. 1999. *Commentary on the SWRCB Staff Protocol for Water Allocations in the Russian River and Other North Coastal Rivers*. May 4, 1999