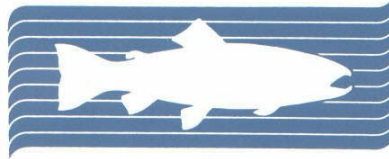


CALIFORNIA TROUT



KEEPER OF THE STREAMS

November 10, 2006

Mr. Russell M. Strach
Assistant Regional Administrator,
Protected Species division, NMFS
650 Capitol Mall, Suite 8-300
Sacramento, CA 95814-4706

RE: INFORMATION FOR ESA RECOVERY PLANNING, ALL CALIFORNIA-RELATED PLANNING DOMAINS

Dear Mr. Strach:

This letter responds to your agency's request for information from the public regarding the preparation of recovery plans for 5 ESUs of salmon and 5 DPSs of steelhead trout as noticed in the Federal Register/Vol.71, No. 175 (Monday, Sept. 11, 2006) pp. 53421-53422. For your convenience, following general comments applicable to all recovery plans and the process of planning for steelhead recovery, we have grouped other comments using the five information categories outlined in the last paragraph of the above Fed. Reg. notice.

By way of introduction, California Trout, Inc., is a 35-year old stream conservation organization whose mission is to protect and restore wild trout and steelhead waters throughout California. Our 6,000 plus members have a vital interest in the timely development of effective and implementable recovery plans for steelhead throughout the State from both conservation and fisheries perspectives. We have long worked with your agency and the CA Dept. of Fish and Game (DFG) to implement our shared goals, and will continue to do so until such time as those goals have been achieved.

General Comments Applicable to All Planning Domains

Plans Must Be Science-based.

First and foremost, CalTrout believes that good management, including the recovery planning process, can only be successful if founded upon the best and most current available scientific understanding of *Oncorhynchus mykiss*. Because this species, more than many others, exhibits such a complex array of life history strategies and wide variety of phenotypic characteristics underlain by a complex genome, recovery planning (and implementation) will only succeed if it encompasses all of the substantive breadth of this species using the most informed and comprehensive possible modern scientific understanding of its variability. We share NOAA Fisheries' goals when the agency listed the various steelhead metapopulations: to recover these groups of populations to the point where they and the fisheries they support may be deemed biologically self-sustaining and consequently de-listed.

In this regard, it is our expectation that recovery plans developed by your agency for the four California recovery planning domains will encompass and be based upon all of the substantive perspectives and recommendations made by the respective regional domains' Technical Recovery Teams (TRTs), those groups of scientists assembled to advise NOAA Fisheries on the subject. To do otherwise would be, essentially, a declaration by NOAA Fisheries that the assembled scientific minds applied to the question of framing what recovery should look like, from a biological and ecological perspective, failed to provide such best available scientific information to the agency. If any recovery plan emerges that fails to be founded directly on a TRT's best scientific judgment regarding the biological and ecological framework for recovery, that plan would surely lack any public credibility. Such a plan not based in the best scientific advice would surely be an invitation to challenge on its adequacy with respect to the biology and ecology of *O. mykiss*.

No Need to Re-invent the Wheel: Update It.

Prior to, during, and subsequent to the listing of these *O. mykiss* ESUs in California, NOAA Fisheries developed a large number of compilations of information, including technical memoranda and other publications, such as "Factors for Decline: A Supplement to the Notice of Determination for West Coast Steelhead Under the Endangered Species Act (August, 1996)," "Viable Salmonid Populations and the Recovery of Evolutionarily Significant Units (June, 2000)," "West Coast Steelhead Status Review" (1996), the findings contained in the Federal Register notices of listing themselves, and numerous other documents. The DFG researched, developed and certified the "California Steelhead Restoration and Management Plan" (Feb. 1996) that notes specific actions the Department believes to be essential to restoring steelhead in California. All of this information, taken together with the results of the most recent scientific advisory team (TRT) efforts, including Population Characterization/Identification Reports and updated TRT Viability Criteria assessments, among others, should be considered in recovery planning efforts for each of the four California domains.

Adaptive Management in the 21st Century.

We urge NOAA Fisheries to develop a TRT-science based plan at the earliest possible date. This will facilitate stakeholder/public dialogue with your agency and move actual recovery implementation closer to fruition. It is not necessary to wait to publish the agency's vision of recovery when it is "perfect," since new information, research results, and discoveries regarding this highly variable species emerge annually, if not monthly. Waiting for "the latest, greatest" recent study prior to daylighting NOAA Fisheries' vision of steelhead recovery for these four domains is not in the public's best interest or in keeping with the Endangered Species Act (ESA), which requires NOAA Fisheries to base its decisions on the best available science.

This is not to say that as information emerges, even following completion of a recovery plan, it cannot and should not be used to improve the focus of recovery planning. CalTrout believes that watershed management in the 21st Century should proceed in an adaptive sense as clearly articulated in Carl Walter's definitive work on the practice, "Adaptive Management of Renewable Resources," (2001, Blackburn Press). The adaptive management cycle sets resource management goals in a collaborative environment, and develops specific objectives that are clearly measurable. After framing these goals and objectives, the results of effective and regular monitoring must underpin a periodic re-assessment of progress against the *a priori* quantifiable objectives or "yardstick" set out initially. Success or failure of recovery actions may then be gauged, and subsequent recovery actions adjusted according to lessons

learned in this adaptive information cycle. Thus, CalTrout believes that these recovery plans should be updated over time as more information from monitoring, stronger, better-tested hypotheses, and new discoveries regarding effective restoration and recovery practices emerge. It is incumbent upon NOAA Fisheries to proceed in this adaptive fashion with recovery of *O. mykiss* in these four domains.

We recommend that a strong monitoring plan be developed and included as part of the recovery plan, and we are aware that a monitoring plan is currently being finalized by NOAA Fisheries in collaboration with the DFG. We applaud that effort, and look forward to reviewing the monitoring plan for adequacy. As information is gained useful to recovery throughout this crucial monitoring, it should be reviewed and applied to the recovery plans at least bi-annually.

In keeping with ESA Section 4(f)'s requirement that a recovery plan identify "objective, measurable criteria which, when met, would result in a determination that the species be removed from the list" of endangered or threatened species, CalTrout believes that NOAA Fisheries should develop a matrix of the measurable objectives specified, much like a "report card," for each of the recovery plans, and this report card should serve as the basis of determination of success/failure of actions implemented to further the goals and objectives of each recovery plan. Clearly, recovery plan-recommended actions should be revised as necessary based on this periodic science-based re-assessment of results achieved. Perhaps the most significant single recovery assessment benchmark NOAA Fisheries must, at minimum, achieve is to document bi-annually the progress made on at least the top three priority action items recommended in each domain's recovery plan.

Bring Funding and Staff to Adequate Levels.

From CalTrout's perspective, NOAA Fisheries is currently inadequately funded and staffed to both develop and implement these four steelhead planning domain recovery plans. The agency should make a clear case in future budgets regarding the scope of recovery of steelhead trout throughout California to the Department of Commerce and Federal budgeting agencies and committees, in order to secure the requisite means to actually do more than print and publish planning documents. Resources required for fieldwork to do effective monitoring for the all-important information feedback loop required by modern adaptive management are considerable, and we believe NOAA Fisheries is currently under-equipped to do this important work, even to contribute more than a few positions to the collaborative work envisioned with the DFG and others. This collaborative recovery work spans 1,100 miles of coastal streams and tens to a hundred thousand square miles of watersheds inhabited by anadromous *O. mykiss* and the resident forms with which it freely interbreeds. We urge NOAA Fisheries to secure adequate resources to match the geographic, biologic and ecologic task.

Work With State Agencies, NGOs and Interested Public in Priority Watersheds.

NOAA Fisheries can leverage its own resources and efforts by working collaboratively with DFG and other state agencies, relevant NGOs, landowners, and interested stakeholders and volunteer groups to maximize the opportunities to implement substantive recovery actions in strategic watersheds. CalTrout believes that the strategic watersheds for each of the recovery planning domains are those rivers or streams in which the dollars and manpower allocated have the greatest chance to recover the greatest number of threatened or endangered steelhead in the least amount of time. This prioritization exercise will be critical to achieving meaningful recovery results in the least possible time.

Role of Estuaries/coastal lagoons: recent M.A. Thesis, U.C. Santa Cruz

As an example of information that will come to public attention periodically that substantially increases our knowledge of *O. mykiss* biology and ecology, a study of the utility of coastal estuary/lagoon habitat in promoting growth, ocean survival and return spawning of steelhead has recently been published: Bond, Morgan H. 2006, Importance of Estuarine Rearing to Central California Steelhead (*Oncorhynchus mykiss*) Growth and Marine Survival, U.C. Santa Cruz M.A. Thesis, 59 pp. NOAA Fisheries should incorporate this significant advance in knowledge of estuaries as essential habitat for recovering steelhead in the four planning domains into the new recovery plans. We recommend that NOAA Fisheries also initiate or fund studies that geographically extend our knowledge of the utility of coastal estuaries and lagoons in recovering steelhead throughout the four California planning domains.

Update “Steelhead Conservation Efforts” (Aug. 1996).

The NOAA Fisheries summary of efforts to recover steelhead published in 1996 was a useful compendium to illustrate what had been done by that time. Much has been accomplished in the intervening decade, including but not limited to genetic studies in a variety of watersheds done by NOAA, USFWS (Nielsen, 2005) and others (Greenwald, 2005), descriptive inventories of steelhead habitat and passage barriers such as that done by the Conception Coast Project (Stoecker, et al, 2002) for the Santa Barbara County South Coast streams; Stoecker’s similar work on the Sisquoc (2003) and Santa Ynez Rivers (2004), and the CalTrout Santa Monica Mountains Conservancy review of habitat and barriers (CalTrout, 2006). All of these should be considered as NOAA Fisheries develops its recovery plans.

Review of Recovery Plans by Recovery Science Review Panel

CalTrout also supports NOAA Fisheries’ process of establishing a panel of high-level independent academic research science professionals to ensure that recovery science meets the most rigorous scientific scrutiny regarding modern ecologic and evolutionary theory. This process is described at <http://www.nwfsc.noaa.gov/trt/rsrp.cfm> as follows: “The Recovery Science Review Panel consists of six highly qualified and independent scientists. The panel performs the following functions:

1. Review core principles and elements of the recovery planning process being developed by the NMFS.
2. Ensure that well accepted and consistent ecological and evolutionary principles form the basis for all recovery efforts.
3. Review processes and products of all Technical Recovery Teams for scientific credibility and to ensure consistent application of core principles across ESUs and recovery domains.
4. Oversee peer review for all recovery plans and appropriate substantial intermediate products.”

All reports of this high-level scientific review panel to date can be found at the URL listed above as of the date of this letter. All of the substantive scientific comments apropos of recovery planning contained in these reports should be integrated into recovery plans for these four California steelhead domains. CalTrout recommends that NOAA Fisheries continue to utilize this level of scientific review in the development of these recovery plans.

Regarding the specific information areas NOAA Fisheries specified in the September 11, 2006 Fed. Reg. notice, CalTrout offers the following comments.

(a) Biological and other criteria for removing the ESUs or DPSs from the list of threatened and endangered species.

Use the Scientific Criteria Developed by TRTs.

We support NOAA Fisheries' established protocol for developing best-available-science criteria, biological and/or other information, through the assembly of regionally-based scientific expertise represented by the Technical Recovery Teams (TRTs). These scientist groups are keenly aware of both ecologic theory and practice as well as published and ongoing scientific studies of steelhead biology, genetics, stream geomorphology, and other pertinent scientific disciplines that must work interdisciplinarily to achieve meaningful recovery of steelhead throughout California. We urge NOAA Fisheries, in developing recovery plans and teams, to rely on the best available scientific advice of these established TRTs. To date, these teams have published a number of critically important technical memoranda, with more to follow soon, no doubt, including, but not limited to

- Predicting the Potential for Historical Coho, Chinook and Steelhead Habitat in Northern California. NOAA Tech. Memo NOAA-TM-NMFS-SWFSC-379 (June, 2005)
- Creating a Comprehensive Dam Dataset for Assessing Anadromous Fish Passage in California. NOAA-TM-NMFS-SWFSC-376 (May, 2005)
- Contraction of the Southern Range Limit for Anadromous *Oncorhynchus mykiss*. NOAA-TM-NMFS-SWFSC-380 (August, 2005)
- Summary of Monitoring Activities for ESA-Listed Salmonids in California's Central Valley (March, 2005) NOAA-TM-NMFS-SWFSC-373
- Updated Status of Federally Listed ESUs of West Coast Salmon and Steelhead (June, 2005) NOAA Technical Memorandum NMFS-NWFSC-66
- Potential Steelhead Over-Summering Habitat in the South-Central/Southern California Recovery Domain: Maps Based on the Envelope Method. 2006. NOAA-TM-NMFS-SWFSC-391

CalTrout is assuming, of course, that NOAA Fisheries will depend heavily on the guidance provided by NOAA Technical Memorandum NMFS-NWFSC-42, "Viable Salmonid Populations and the Recovery of Evolutionary Significant Units (June, 2000), as well as the yet-to-be published Population Characterization and Viable Population Criteria reports from each of the TRTs. These latter updates to the VSP Memo should provide the basis for NOAA Fisheries to make metapopulation-by-metapopulation determinations of appropriate recovery actions.

A number of studies related to population status and, by inference, biological and other criteria for de-listing steelhead in Santa Cruz and San Mateo Counties should also be reviewed, referenced, and incorporated as appropriate in the relevant regional recovery plan, and can be found at the date of this letter at <http://csc-s-maps-q.csc.noaa.gov/salmonid/html/salmonid/population.htm>

Utilize the California Coho Salmon Recovery Strategy as a Template.

“On June 25, 2004 The Recovery Strategy for California Coho Salmon was finalized. The final document includes revisions based on the Department's "Response to Comments on the Draft Recovery Strategy", clarification of "Recovery Goals and Delisting Criteria," incorporation of "Timber Management Actions" approved by the Commission, and changes requested by the Commission at the February 4, 2004 public hearing. The Recovery Strategy is extensive and complex, including 13 chapters, more than 750 recommendations, 1,000 recovery tasks, and 9 appendices.” (see <http://www.dfg.ca.gov/nafwb/CohoRecovery/>) This plan has a number of carefully structured elements that can also serve quite well as a template for framing recovery plans for steelhead throughout California. NOAA Fisheries would be well-advised to consider this comprehensive Coho plan while formulating steelhead recovery plans.

Recovery Goal Should Be Restored Fisheries.

CalTrout understands that the principal purpose of recovery planning is to frame the essential criteria that would allow the various population units to be de-listed. Recovery goals should also recognize that not only have we nearly lost the species, important for intrinsic ecologic reasons, but we have also lost important *fisheries* for steelhead throughout California as a result of the requirement to bring these stocks back from the brink of extinction.

CalTrout believes that NOAA Fisheries has an implicit duty, as guardian of public trust resources, to bring steelhead not only far from the edge of extinction, but to restore various population units to the extent that prior *fisheries* for steelhead may once again resume. Any less than that ignores the rich heritage of California and the West in general, as if these fisheries were never a significant part of the cultural heritage and economic engine in California. This is a case that cannot be made based on the known history of these steelhead fisheries.

(b) Factors that are presently limiting or threaten to limit survival of the ESUs or DPSs.

Use the Coho Recovery Plan As a Template.

As noted above, the California Coho Recovery Strategy recently developed by DFG and others to address Coho salmon recovery lists a wide variety of factors that limit survival of Coho. Most, if not all, of these also apply to limitations on recovery of steelhead throughout their range. NOAA Fisheries should look at this list of factors carefully to determine which of them also apply to steelhead.

Use “Factors For Decline.”

NOAA Fisheries developed a supplement to its determination of listings for West Coast Steelhead, as noted above [Factors for Decline: A Supplement to the Notice of Determination for West Coast Steelhead Under the Endangered Species Act (August, 1996)]. In this Supplement, a wide variety of relevant factors were clearly delineated. These all remain, in CalTrout’s view as of this date, specific limiting factors for survival of the described, listed population units.

In addition, and in particular the farther south one considers, the loss of coastal wetlands, sloughs, and estuaries (noted in the Supplement) continues to be a largely understudied factor in the decline of the

Southern and South/Central planning domain. The recent MA Thesis by Bond on the subject illustrates the large potential contribution of estuarine habitat to improve conditions for recovery and restoration of steelhead throughout California.

California Trout has long maintained that the principal limiting factor keeping steelhead populations from attaining former population sizes throughout the State is the blockage of access to historic spawning and rearing habitat in the upper reaches of watersheds due to anthropogenic features installed in streams and rivers, i.e., culverts, road crossings, dams and other similar water diversion structures, that prevent upmigrating adult steelhead from reaching a significant proportion of useful spawning and rearing habitat upstream of such passage barriers. Indeed, NOAA Fisheries scientists recently endorsed this long-held CalTrout tenet in a new Technical Memo thusly: "...The pattern of basin-level extirpation showed a latitudinal gradient, with the highest extirpation rates in the south, confirming that a range contraction has taken place. **Most of the extirpations (68%) were associated with anthropogenic barriers to fish migration (dams, flood-control structures, culverts, etc.)...**" [Contraction of the Southern Range Limit for Anadromous *Oncorhynchus mykiss*. NOAA-TM-NMFS-SWFSC-380 (August, 2005)] (emphasis added). We could not agree with this conclusion more.

Inadequate consideration of other *O. mykiss* life-forms.

This inadequate consideration of above-barrier areas also has implications for recovery planning in that migratory passage barriers prevent the interbreeding that historically took place between the anadromous form and the more resident or adfluvial forms of *O. mykiss* now isolated above these impassable manmade barriers (which interbreeding still occurs below such barriers). It is uncertain how much of a contribution the latter two forms have made to anadromy in the species, but it is CalTrout's belief that this lack of genetic recombination may be significant, on a case-by-case basis, in limiting recovery of population units, and, in particular, in the more southerly part of the range of the species as a whole. As we will reiterate below at the appropriate subject heading, this is an area ripe for further research by NOAA Fisheries and other scientists, in order to understand just how much of a contribution to anadromy these latter life-history forms may make.

CalTrout has commented to NOAA Fisheries previously on the issue of landlocked *O. mykiss* above impassable manmade barriers, as well as on co-occurring resident fish below such barriers. We here attach to these comments on recovery planning two comment letters, and incorporate our comments on co-occurring *O. mykiss* residents and above-barrier *O. mykiss* by reference here. (See attached letters dated March 8, 2005 (Critical Habitat, pp. 3 et seq.) and December 1, 2005 (DPS Rule, pp. 5 et seq.)

The lack of inclusion of *O. mykiss* and their habitat above such manmade passage barriers creates an untenable position for NOAA Fisheries. As currently structured, the listings for steelhead suggest that the various population units can be recovered using only a small fraction of their former geographic ranges and habitat quantity. This might be possible for some salmonids, but for steelhead, that characteristically reach for the highest parts of a watershed to spawn, it is hugely unclear how NOAA proposes to recover these population units without including the high-quality spawning and rearing gravels and perennial, spring-fed stream reaches of the upper watersheds. Few, if any, hydrologists, fluvial geomorphologists, or salmonid biologists argue, as far as we have been able to determine, that the upper and lower parts of a watershed are hydraulically, biologically or ecologically interchangeable. CalTrout urges NOAA Fisheries to remove these blinders when recovery plans are developed.

(c) Actions to address limiting factors and threats:

Continue to identify and modify or remove high-priority passage barriers.

Given our shared viewpoint on the most significant recovery limitation, i.e., the existence of manmade impassable barriers to spawning migration, we have an obvious priority for actions to address these limiting factors and threats. The first priority, in CalTrout's view, is to identify, prioritize, and modify or remove these barriers to upmigration of spawning adults. Indeed, if one looks around the State to see what types of projects have been facilitated or funded by salmonid restoration dollars to date, it is clear that the majority of projects have been related to exactly that action: modification or removal of passage barriers. CalTrout applauds the acumen of NOAA Fisheries, State and local governments, private landowners, friends of the watershed groups and other interest groups in recognizing this priority. We have engaged in a number of efforts from Crescent City to Southern California to do exactly this type of work for well over a decade. We urge NOAA Fisheries to continue this plan of action to recover steelhead throughout the State by working with State and local water agencies to assist them technically and in any other way feasible to continue the modification or removal of high-priority passage barriers.

In that regard, much is available to guide this work, as we have previously noted, including the Coho Salmon Recovery Strategy, the Santa Monica Mountains Steelhead Habitat Assessment, similar work on the South Coast of Santa Barbara County, and for the Sisquoc River and Santa Ynez River, among others. As we noted above, it would be very useful for NOAA Fisheries to update the good 1996 summary of existing conservation efforts, in order to assess where best to next apply this practice of assessing high-priority passage barriers for modification or removal.

An excellent bibliography of regional studies related to salmonid restoration planning has been developed and published for San Mateo and Santa Cruz Counties, and should be referenced by NOAA recovery planners in the development of the appropriate regional plan:

<http://csc-s-maps-q.csc.noaa.gov/salmonid/html/library/biblio/salfish.htm>

Protect the best, restore the rest.

There are watersheds within the four planning domains that provide adequate habitat and flows to support healthy, self-sustaining populations of steelhead. Enforcement of fisheries regulations, water flow conditions, TMDL regulations and all other applicable management practices that now exist would be a good first step to protect these "last best places" for steelhead to ensure no further degradation in these watersheds or watershed segments.

Beyond that, securing adequate flows for fish passage during critical life history stages from upmigrating spawners to juvenile rearing should also be a high priority for recovering these population units. Flows support both passage and temperature criteria, among others. We urge NOAA Fisheries to include as a recovery action working with State and local water agencies to assist them technically and in any other way feasible to secure adequate flow to protect and recovery steelhead.

Further, timber and rangeland practices that have limited recovery of steelhead should be more adequately addressed. As in the Coho Recovery Strategy, attention to timber harvest plans may play an important role in recovering steelhead, with particular attention given to stream setbacks for shading spawning and rearing gravels, and sedimentation due to construction and maintenance of logging roads.

In other places, bank erosion due to unsustainable grazing practices should be addressed in order to reduce further degradation of stream channels and sedimentation of spawning and rearing habitats.

In addition and as noted above, inclusion of other life history forms of *O. mykiss* on a case-by-case basis should be included in recovery plans as more information emerges regarding the relative contribution to anadromy that these other life-history forms make.

In framing biological and ecological recovery criteria, it is important to assess differences in independent and dependent populations of steelhead within each grouped population unit. The terms “source population” and “sink population” have also been identified with the concepts of independent and dependent populations. For each recovery planning domain, NOAA Fisheries must recommend that, as high priority actions, independent/source populations are highly significant watersheds in which to secure recovery. Additionally, a significant fraction of the dependent populations, generally understood to be the shorter coastal streams, must also effect recovery, in order for ecologic linkages such as straying to continue to effectively re-colonize along extinguished or nearly extinguished segments of the California coastal stream landscape.

Finally, all action items should be prioritized by category, i.e., passage barrier actions, flow recommendations, habitat restoration strategies, and so forth.

(d) Estimates of time and cost to implement recovery actions:

The ESA requires that recovery plans take this step, thus, it is necessary. However, in order to be able to interpret this time and cost information in the appropriate context, additional cost estimates are necessary to be sufficient for understanding the context in which cost estimates, in particular, must be understood. Specifically, two other cost subject areas must be examined for proper contextual understanding of the economics of steelhead recovery in these four planning domains.

1. Economic benefits accruing from identified fish passage barriers

The economic benefits that have accrued to public and private entities including landowners, municipalities, extractive and production industries and irrigated agriculture need to be understood in order to properly frame the question of recovery implementation costs. Another way to put this question is “recovery costs...compared to what?” CalTrout believes that until the general public (for whom NOAA Fisheries protects these resources under the public trust doctrine) understands the immense economic benefits that have accrued to both public and private enterprise from the creation of the fish passage barriers and water diversion structures identified in the extant literature as limits to recovery, the full and clear picture of steelhead economics cannot be properly or fully framed.

A miniscule example of the meaning of benefits to public and private enterprise can illustrate this point. The U.S. Bureau of Reclamation (USBR) owns and operates a number of dams in California, and keeps certain statistics regarding the operations of these dams. Illustrating the benefits that have accrued to a single tall earthen dam on the Santa Ynez River, the Bureau states:

“...In 1990 the Cachuma Project's years of producing high-value crops gave it membership in Reclamation's "Billionaire's Club," making it one of nineteen reclamation projects nationwide - and next to the neighboring Santa Maria Project, the

youngest - that have accumulated over one billion dollars worth of gross crop receipts over the life of the project...” (See <http://www.usbr.gov/dataweb/html/cachuma.html>)

This billion dollar mark quantifies only ex-farm prices to agricultural enterprises in Santa Barbara County, and is not inclusive of the additional “downstream” economic benefits to transportation, wholesaler, added-value and retail enterprises. To continue this illustration just for the Santa Ynez River, two other dams (Gibraltar Dam and Juncal Dam) above the Cachuma Project’s Bradbury Dam also provide municipal and industrial water (including agriculture) to south coast cities including Santa Barbara, Montecito, Summerland, Carpinteria and Goleta, and unincorporated areas of the Santa Barbara County South Coast, adding untallied hundreds of millions of dollars of housing projects, retail businesses, agriculture and industrial uses in those areas as well.

This is just one of the several hundred water diversions that are significant limiting factors in the recovery of steelhead throughout the identified planning domains. There are also freeway, highway, road and railroad stream and river crossings, each of which may have an impassable culvert or other structure preventing steelhead passage, and other water diversion structures besides dams in streams that likewise impair passage. The economic benefits that have accrued to public and private entities as a result of the construction and operation of all of these passage impediments are the proper tapestry against which to discuss the costs of recovery actions. NOAA Fisheries should, at the very least, review and summarize readily available economic databases for California counties and cities concerning valuation of real property and GDP of these entities since at least the end of the Great Depression, in order to provide a proper context in which to understand recovery action costs.

2. Economic benefits accruing from fisheries in recovered steelhead population units

A second economic dataset that must be compiled in order to fairly and properly frame the issue of recovery cost estimates is the *economic benefits* of recovering steelhead population units listed in the four planning domains. Prior to and during the anthropogenic influences that caused the accelerated and precipitous recent decline in steelhead stocks, world-renowned recreational (and in some cases commercial) fisheries existed for these populations. Together with the economic multipliers that typically are associated with recreational fishing in California, the economic benefits of recovered steelhead in the four planning domains is in the tens, and probably hundreds, of millions of contemporary and future dollars to the California and national economy. Without estimates of these economic benefits of recommended recovery actions, only one side of the costs coin is being examined. NOAA Fisheries must also identify the economic benefits of recovery actions in order to fairly and properly discuss the subject of steelhead economics.

Stratify/prioritize time and costs based on “biggest bang for the buck.”

NOAA Fisheries is, we are certain, cognizant of the need to prioritize projects based on time and cost estimates, and we only here remind NOAA that this prioritization is crucial to implementing the most cost-effective recovery recommendations first, in order to more efficiently and quickly recover the largest number of steelhead in each of the planning domains in the least time.

(e) Research, monitoring, and evaluation needs:

We have already highlighted three issue areas that CalTrout believes NOAA should focus future research effort upon. These are

1. Incorporation of new genetic studies information, e.g., Nielsen, et al. (2005), Girman and Garza (2006), and any other similar new information.
2. Broadening the geographic scope of knowledge and ecologic understanding of the importance of coastal estuary/lagoon habitat in recovering steelhead.
3. Improving our understanding of the degree to which other life history forms of *O. mykiss* (resident, adfluvial, etc.) are important in the maintenance of genetic diversity, overall phenotypic plasticity, and the anadromy trait in this species in the four planning domains identified.

Beyond these research areas, a number of other steelhead biology and ecology questions are important to answer in order to more fully understand how best to recommend specific recovery actions.

For example, the question has repeatedly been raised regarding the thermal tolerance of steelhead, particularly in the southern two planning domains where water temperatures can reach putative lethal levels in the summertime. From simple laboratory aquarium tests of (only physiological) temperature tolerance (of actual southern range steelhead young and adults) to more sophisticated field studies of behavioral adaptations to temperature regimes found in more southerly streams, these kinds of studies may better inform recovery recommendations in the future. Questions such as “do cool upwelling areas (gravel or bedrock) provide temperature refugia that are actively used by rearing *O. mykiss*?” and “does sufficient food supply confer additional tolerance to higher temperatures over summer?” need to be answered. A number of studies now illustrate that these adaptive traits in *O. mykiss* may be in play, such as the recent work by Spina (2006) and ongoing studies by Jerry Smith at San Jose State University in Uvas Creek and other watersheds.

Another behavioral trait that begs improved understanding is straying and how that behavior may keep regions from going extinct in the face of local extirpations. Is straying subject to a latitudinal gradient related to the intermittency of stream flow? This becomes important as NOAA Fisheries begins to prioritize watersheds within a planning domain among independent and dependent populations.

Both the temperature issue and the straying/intermittent stream issue loom ever more important in the face of common predictions from the various global climate change/global warming models that have been refined over the last decade or two. As we have seen recently, the frequency and intensity of storm events is changing, and the consensus scientific viewpoint is that there is at least a partial anthropogenic fingerprint on those changes. Whether or not NOAA Fisheries is prepared to address the larger climate change issue in recovery planning remains to be seen, but CalTrout believes that it is only ignored at the peril of accelerated extinction of anadromous *O. mykiss*.

Oceanic regimes affect salmonid growth and return rates to coastal California streams. A good example has been seen this year all along the West Coast, where Columbia River salmonid returns were delayed several weeks, and the Sacramento River salmon run still has not been seen in appreciable numbers as of the date of this writing, over a month late. Recent innovations in electronic tagging of salmon and steelhead should be continued and expanded, so that we can better understand the role of ocean conditions in growth, survivorship and returning spawner fish to the four planning domains in California.

We hope these comments prove useful to NOAA Fisheries/NMFS in the development of recovery plans for the four planning domains in California, and CalTrout eagerly awaits these plans so that we may assist in the implementation of recommended actions. We remain committed to the preservation and restoration of wild trout and steelhead waters throughout California, and anticipate continued good working relationship with your staff as we all work together on this critical steelhead recovery effort. If you would like to discuss any of the above comments further, please contact us at your earliest convenience.

Sincerely,

A handwritten signature in black ink that reads "Brian L. Stranko". The signature is written in a cursive style with a long horizontal flourish at the end.

Brian Stranko,
Executive Director