

## **A synopsis of recent history of California's inland trout management programs: litigation and legislation**

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The management of trout fishing, trout fisheries, and the culture and distribution of hatchery-reared trout have been important features of inland fishery management programs for over 140 years. California's fishery managers have striven to respond to the perceived needs and preferences of the state's inland anglers and to include the values of the larger society. Over the decades those needs and values have changed and resulted in changes in the direction of trout management. In this paper we look at a series of events over the past 25 years and examine how those events are influencing the direction of California trout management programs.

Key words: California, conservation, fish hatcheries, legislation, litigation, native trout, *Oncorhynchus* spp., restoration, trout management

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A focus on trout fishing in California goes back to the origin of the state's principal agency concerned with fisheries, the Board of Fish Commissioners, established in 1870 by the Governor. Trout were reared at the state's first public fish hatcheries located near the City Hall in San Francisco and the University of California in Berkeley (Shebley 1922). In the late 1800s and early 1900s, many non-native fishes were introduced to California, especially some that were regarded highly as food fishes like American shad (*Alosa sapidissima*), striped bass (*Morone saxatilis*), common carp (*Cyprinus carpio*), catfishes, and black bass. Non-native trout were also early arrivals to California with brown trout (*Salmo trutta*), lake trout, (*Salvelinus namaycush*), and brook trout (*Salvelinus fontinalis*) all arriving prior to 1900 (Dill and Cordone 1997). Brook trout eggs were hatched at the San Francisco hatchery in 1871, the same year shad were introduced in the Sacramento River (Dill and Cordone 1997), and the Fish Commissioners first stocked brook trout in 1872 (Shebley 1917). The early Fish Commissioners were more interested in providing fish for food than for recreation, and sport fishing licenses were not required until 1913 (Dill and Cordone 1997). In the late 1800s, "Sport fishing was actively pursued mainly by wealthy dudes, but most families netted fish

for the table and there were no restrictions on commercial fishing” (Harrell 1970; quoted by Dill and Cordone 1997). In the 1800s, a prevailing sentiment of California society, and the spirit of the day, was that people “did not protect a resource but used it” (Dill and Cordone 1997).

Trout fishing has been among the most important and popular programs of the Department of Fish and Game (CDFG; beginning in 2013, California Department of Fish and Wildlife [CDFW]) through most of its history. In the 1980s trout fishing was the most popular type of fishery, and accounted for about 60% of inland angling effort in California (Fletcher and King 1988). While there may be fewer anglers now per capita, trout continue to be the most sought after target of inland anglers, currently at 59% of the total of all types of fish (USFWS 2011).

The early 1900s saw emphasis on the hatchery production of fingerling trout from eggs collected at dozens of egg-taking stations. Distribution of fingerlings was initiated throughout the state. Additionally, trout were moved from their native streams to many other waters, especially the previously fishless lakes and streams of the high mountains. These introductions were carried out by the “Deputy Fish Commissioners” and transplanting trout was considered a great benefit, even if it was a difficult task (Ellis and Bryant 1920). Even conservation organizations like the Sierra Club were involved in the effort to fix “barren” waters and create sport fisheries through transplants (Rahel 1997).

Beginning in the 1930s, CDFG saw the development of scientific staff with a cadre of fishery biologists to direct freshwater fishery management programs. After World War II, a major expansion of the hatchery program began and extended into the 1960s, a period when most of the current trout hatcheries were built (Leitritz 1970). The catchable trout program was then expanded after heavy angling pressure depleted trout in roadside waters. Catchable trout stocking spread rapidly throughout the state after the war, and the Wildlife Conservation Board provided more than \$4 million for hatcheries (Butler and Borgeson 1965). The post-war era also saw increased stocking of fingerling trout, when CDFG developed its methods for aerial stocking of mountain lakes by dropping fingerlings from tanks in specially outfitted airplanes, a development that made stocking high mountain lakes much more efficient and less expensive.

As a result of the hatchery expansion, production of catchable trout (then 18 to 20 cm rainbow trout [*Oncorhynchus mykiss*]) quadrupled to about seven million fish annually by 1962 (Butler and Borgeson 1965). In 1990, the Department stocked 19 million trout (average weight: 8.1 fish per kg).

The post-war hatchery expansions coincided with a period of dam-building and a huge increase in reservoirs, thus changing the state from one marked by lotic environments with trout and salmon as the featured gamefish to one with significant lentic habitats having both warmwater and coldwater fisheries. Emphases remained, however, on coldwater species for both anglers and fishery managers (Dill and Cordone 1997). Fishery managers also embarked on large chemical treatment projects to eliminate “rough fish”—native and introduced fishes that were deemed to have low “sporting value.” Many miles of streams and large lakes and reservoirs were treated with rotenone to eradicate these fishes considered competitors of trout (Dill and Cordone 1997). One of the largest efforts was the treatment of 256 miles of streams in the Russian River basin, during 1952–1954, which eliminated most of the nongame fish populations (Pintler and Johnson 1956). During this era, an emphasis on natural resource management was practically abandoned and the management of inland sport fisheries was paramount, resembling “that of a big, modern farming program” (Dill

and Cordone 1997). The California Fish and Game Commission's inland fisheries policy stated, "The basic objective should be to supply the best possible fishing for the greatest number of anglers" (CDFG 1953).

By the late-1960s, the social climate was changing rapidly and awareness of environmental issues was becoming increasingly widespread. One result of these societal shifts was the enactment of environmental legislation at both national and state levels. The National Environmental Policy Act (NEPA), its state counterpart the California Environmental Quality Act (CEQA), and the Endangered Species Act of 1973 (ESA) all would have great impact on trout management and natural resource conservation in general. Other examples of this change in the social climate were the establishment of the Clean Air Act and the Clean Water Act.

While hatchery trout programs remained the largest aspect of inland fishery management, the 1970s saw the advent of programs focusing on wild trout management in California as well as on the conservation and restoration of the state's native trout. A social climate that was putting a greater emphasis on native wildlife, natural environments, and increasing ecological knowledge likely contributed to those changes.

Trout management in California has reflected in many ways the prevailing values of the times during its history. Changing values of the angling clientele and of society have altered management priorities, and perhaps for some not as fast as it was needed. Californians have not been shy about using the legislature, the courts, and the ballot to effect changes they want in resource conservation and management. These approaches produced a significant outcome for trout streams and other resources in California when litigation brought by California Trout in the 1980s succeeded at applying the Public Trust Doctrine to Mono Lake, and enforcing long-ignored provisions of the California Fish and Game Code (Code; Sections 5937 and 5946) that required keeping "fish in good condition" downstream of dams. In this paper, we look at examples of these actions and the subsequent outcomes for the state's management of trout.

## METHODS

We selected a set of important events of the past 25 years to examine the roles they have played in the recent direction or development of California's inland trout management programs. We reviewed literature from scientific journals, bulletins, proceedings, and other sources often referred to as "gray literature" to inform and build context regarding these events, the times when they occurred, and the affect they had on Department operations. Other sources reviewed included documents such as unpublished reports, manuscripts, departmental letters and correspondence, and planning documents. Moreover, we reviewed legislation that directs current CDFW trout management programs along with decisions and orders resulting from litigation concerning those programs. These sources were used to describe the effects of the events that contributed to the direction of trout management in recent times.

### EVENTS IN TROUT MANAGEMENT

*Trout Unlimited lawsuit, 1992.*—Trout Unlimited (TU) held a long-standing view that the Department's budget resources were spent disproportionately in favor of the hatchery trout program and that management of wild trout, native trout restoration, and coldwater habitat protection were substantially underfunded. Additionally, they believed the stocking of hatchery trout had a suite of negative effects that had never been analyzed through environmental regulatory review (CEQA and NEPA). Trout Unlimited developed and filed a lawsuit against CDFG in 1992 that addressed these concerns and petitioned the court to mandate preparation of an Environmental Impact Report (EIR) concerning the trout hatchery and stocking program. The lawsuit outlined effects on wild trout from stocking hatchery trout that included the effects of disease, competition, predation, and hybridization, along with pollution from hatchery effluents and efficiency issues in both culture and stocking of hatchery trout.

In response, the Department agreed to conduct the environmental review under CEQA in 1993, and consultants were contracted to prepare a draft environmental document in 1994. By 1996, after rounds of review and revisions to the draft, the document was deemed to be inadequate. There were insufficient funds and no mechanism was in place to retain a contractor for additional work on the document. In lieu of re-starting the stalled hatchery and trout stocking environmental document, CDFG initiated development of the Strategic Plan for Trout Management in 1997. This process was established to determine goals and strategies for guidance of all of the Department's inland trout programs into the early 2000s.

*Lake Davis chemical treatment, 1997.*—The appearance of northern pike (*Esox lucius*) in reservoirs on tributaries to the Middle Fork Feather River, Plumas County, during the 1990s created formidable challenges for CDFG fishery managers. There was great concern this coolwater predator could escape or be illegally moved into the Feather River and gain access to the Sacramento-San Joaquin Delta, which is believed to have very favorable habitat conditions for northern pike. If northern pike had become established in the Delta it would have placed listed salmon (*Oncorhynchus* spp.), steelhead trout (*O. mykiss irideus*), delta smelt (*Hypomesus transpacificus*), and other species of concern at great risk from predation. Additionally, there would be almost no possibility of eliminating that invasive predator from the hundreds of miles of Delta streams and river channels once it became established. It was apparent that containing northern pike in the headwaters and eradicating them from the reservoirs was the best management option to control the expansion of pike into other state waters.

Northern pike were reported by anglers from Frenchman Lake in the 1980s, and in 1988 an angler reported catching a 3.2-kg northern pike (Lee 2001). A chemical treatment of the reservoir and its tributaries using rotenone was successfully implemented in 1991. Northern pike were found downstream of Frenchman Lake in the Middle Fork Feather River during 1992, and a chemical treatment there also appeared successful. Soon after, northern pike were reported in nearby Lake Davis, a popular and productive trout fishery. By the mid-1990s, northern pike had become a dominant species in the reservoir. Planning for a rotenone treatment of Lake Davis had the added difficulties of a larger project area, a fishery with greater contribution to the local economy, and the lake served as a domestic water source for the town of Portola. Departmental fishery managers encountered growing opposition from residents and local governments in Plumas County as the treatment plans developed from 1995 to 1997. The treatment was completed October of 1997 under difficult

and extraordinary circumstances that were the result of actions of local opponents of the project (Lee 2001).

The level of conflict and controversy surrounding the Lake Davis rotenone project was unforeseen by some CDFG fishery managers. Public opinion and reaction also had unforeseen consequences for California and for the use of piscicides within the state and in other western states. After Lake Davis, litigation was filed in Montana to stop a large chemical treatment project of Cherry Creek that was intended to facilitate the restoration of native cutthroat trout (Wilkinson 1999). Plumas County interests were able to influence legislation that provided nearly \$10 million of awards to mitigate economic damages resulting from the Lake Davis treatment project. The ensuing controversy around use of rotenone created enough negative public opinion and opposition that CDFG leaders were reluctant to propose new rotenone projects. Not having rotenone available as a management tool hindered progress in the restoration of native trout in California for more than a decade.

*Strategic Plan for Trout Management.*—In the 1990s, CDFG fisheries leaders recognized the need for an overarching plan that identified issues and concerns of all of the state's trout management programs. They then began to formulate goals and strategies to address those issues into the future. A previous planning effort that looked at "forward focused management" for trout recommended emphases on stream restoration and protection, protection of quality wild trout fisheries, restoration of native trout, and efficient use of stocked trout (Villa and Deinstadt 1990). Coincidentally, these priorities were expressed as concerns in TU's 1992 litigation.

Development of the Strategic Plan for Trout Management (Trout Plan) became a much more involved and lengthy process than anticipated in 1997 by the Inland Fisheries Chief when, in writing to TU, he expressed the belief that a draft of the plan would be ready within that year. Development of the Trout Plan involved public participation, focus groups, special interest groups, and hundreds of individuals. A framework draft of the Trout Plan was produced and distributed for public review in 1998. The draft document received numerous cycles of internal review by dozens of CDFG personnel, was revised during 1999–2000, and a public review draft was released in June, 2000. The document was finalized in 2003 and signed by the Acting Director in January, 2004.

*High mountain lake and stream inventory.*—During the 1990s increasing concern was expressed over the declining status of native amphibians and other aquatic species in high elevation lakes and streams. This was especially true for the thousands of lakes in the Sierra Nevada where, historically, there were no native fishes present (Drost and Fellers 1996, Knapp and Matthews 2000). The 1990s was a period that saw efforts such as the Sierra Nevada Ecosystem Project that brought attention to the plight of species like the mountain yellow-legged frog (*Rana sierrae*), which had experienced drastic declines in distribution and abundance (SNEP 1996). Amphibian decline was frequently attributed to the decades of stocking non-native predatory trout by the Department. Fisheries management during the 1990s also incorporated more emphasis on conservation efforts for native non-game species, biodiversity (Winter and Hughes 1997), and ecosystem management approaches (Nielsen 1995).

By 1998, CDFG had initiated a large, multi-year resource assessment program to survey the more than 12,700 high elevation lakes and streams in the Sierra Nevada and Cascade Ranges outside of the national parks. These surveys were intended to gather information on distribution and abundance for native aquatic fauna, introduced trout, and other fishes so that restoration and conservation of native species and management of sport

fisheries could be planned appropriately. Having results of these surveys and assessment data enabled the CDFG to develop a series of Aquatic Biodiversity Management Plans (ABMPs) for watershed basins to guide management that sought to balance the restoration of native amphibian populations while retaining recreational fishing in appropriate waters (Milliron et al. 2004). The ABMPs were first developed for watersheds in the eastern Sierra Nevada and later were prepared for other mountainous areas of the state where conflicts remained between trout management and native amphibian conservation.

In 1999, the decision was made to temporarily discontinue airplane stocking of high-elevation lakes with fingerling trout, a fishery program that had been conducted continuously since the 1950s. This stocking hiatus, in part, helped with determinations of which lakes supported self-sustaining trout populations but also responded to critics concerned with the role of trout stocking in the extirpation of native frogs from much of their historic range. The hiatus also allowed time for survey teams to locate remaining frog populations (M. Lockhart, California Department of Fish and Wildlife, personal communication). The issue of trout stocking impacts to amphibians and other native species remained a contentious issue for CDFG and for organizations that selected it as a focus of litigation against the Department's hatchery and stocking programs.

*Assembly Bill 7, 2005.*—Concerns brought to the California Legislature during 2005 resulted in passage of Assembly Bill 7 (AB 7), which promulgated several mandates for CDFG trout management. These mandates were codified by revisions to the Code (i.e., Section 13007). First, the law established the Hatchery and Inland Fisheries Fund (HIFF) as part of the Fish and Game Preservation Fund. Then, it required one-third of all sport fishing license fees be deposited into the HIFF for the purposes of supporting the state fish hatcheries, the Heritage and Wild Trout Program, and law enforcement activities related to the trout fishing programs. While having funds dedicated by law for trout programs was helpful, the available funding still resulted in challenges for managers to meet the law's requirements. Progress produced by the expanded funding in the early years was short-lived as production goals increased, along with escalating costs in later years.

A featured element of AB 7 was the explicit linkage of some goals for trout production by the state's trout hatcheries to the number of sport fishing licenses sold annually. Initially, the goal for trout released was set so that the number of pounds of trout produced increased from 2.25 to 2.75 pounds (1 kg to 1.25 kg) of trout released per license sold by 2009. Catchable-sized or larger trout were emphasized and comprised from 1.75 to 2.25 pounds (0.8 kg to 1.0 kg) for those initial requirements. Another requirement was that at least 25% of the total number of trout produced by the state must be native trout species. Those species were described as Heritage Trout in Section 7261 of the Code (i.e., California golden trout (*O. m. aguabonita*), Little Kern golden trout (*O. m. whitei*), Kern River rainbow trout (*O. m. gilberti*), Eagle lake rainbow trout (*O. m. aquilarum*), McCloud redband trout (*O. m. stonei*), Goose Lake redband trout (*O. m. ssp.*), Warner Lakes (Valley) redband trout (*O. m. ssp.*), Lahontan cutthroat trout (*O. clarki henshawi*), Paiute cutthroat trout, (*O. c. seleniris*), coastal cutthroat trout (*O. c. clarki*), and coastal rainbow trout (*O. m. irideus*)). Assembly Bill 7 specified a time table for the hatchery system to meet native trout production percentages and numbers of Heritage Trout species produced. Later, initial AB 7 language was modified to both remove target dates that had expired and clarify native trout production requirements.

Production goals mandated by AB 7 stimulated increases in fish production from 2005 to 2008. However, after 2008 and due in part to the loss of federal grant funding for

the hatcheries, the production mandates have proven difficult for the hatcheries to meet. Conditions such as aging hatchery infrastructure, available space, and adequate water have limited the capacity of the hatchery system to produce sufficient trout. Increasing costs, such as fish feed and truck fuels, have factored into production goal shortfalls, and budgetary restrictions on expenditures for capital improvements to facilities have delayed upgrades at hatcheries intended to enhance production capacity.

For the Heritage and Wild Trout Program (HWTP), the similar benefit of enhanced funding in the first years after passage of AB 7 enabled increases in biologist staffing and enhanced efforts for resource assessment surveys and monitoring. In 2013, HWTP began using HIFF expenditures as the State's financial match for needed federal grants. The combined funding was used to maintain wild trout management efforts. Further legislation (Senate Bill 384, 2007) required HWTP to annually recommend to the California Fish and Game Commission additions of 25 stream miles and one lake for designation as Wild Trout waters. This process revised a previous legislative mandate for special angling regulations (Code Section 1727) to one specifically requiring wild trout management. This mandate, along with required annually increasing workloads, created significant work-planning challenges for HWTP.

*Hatchery and stocking program—more litigation.*—A special project of environmental law students at Stanford University developed into a lawsuit in 2006 with the environmental groups Pacific Rivers Council (PRC) and Center for Biological Diversity (CBD) as leading plaintiffs in litigation against the Department's hatchery and stocking programs. These plaintiffs had been in discussions with CDFG fisheries leaders, requesting the Department prepare an EIR concerning hatcheries, stocking, and their effects on native species. A budget request for \$1 million to contract for EIR preparation was authorized. As the lawsuit progressed, in May of 2007 the Superior Court ordered CDFG to comply with CEQA and prepare an EIR to address potential environmental effects of its hatchery and stocking programs. In order to receive federal funding (Sport Fish Restoration Act [SFRA] grants) for hatcheries, the document was prepared to also meet federal NEPA requirements by simultaneously developing an Environmental Impact Statement (EIS). The CDFG trout hatcheries and stocking programs are not eligible for SFRA funding until the NEPA process is completed. This resulted in a significant funding shortage from 2008 to the present.

While efforts were made to secure needed funds in addition to the initial \$1 million for the requisite EIR and EIS and CDFG was revising the contract for developing the EIR, the court issued an interim order restricting fish stocking by the Department. The order prevented stocking of non-native fish where native fishes and amphibians from a list of 25 species determined by the plaintiffs were present, or where field surveys had yet to be conducted to ensure those species were absent. Exceptions were negotiated to these restrictions to allow stocking in artificial reservoirs > 400 ha (1,000 acres) in area or in reservoirs less than <400 ha if they were not hydrologically connected to rivers supporting sensitive native species, like the northern red-legged frog (*Rana aurora*). The state court eventually ordered CDFG to complete the EIR and release the associated CEQA determination by January 2010.

*Lake Davis, 2007—more pike and more rotenone.*—After the 1997 Lake Davis chemical treatment, CDFG faced challenges in rebuilding relationships with the local community. To improve those relationships, surrounding Plumas County waters were stocked with 1.2 million trout, an early opening for the local 1998 trout season was approved, and Lake Davis was re-stocked with more than 2 million trout in 1998 (Lee 2001). Unfortunately, post-project monitoring detected northern pike in the lake during 1999. The Department

initiated efforts to address the situation and established a team located in Portola to develop responses to the expanding numbers of pike. A task force comprised of community members, local government representatives, and Department personnel was formed to develop solutions to the infestation. The director of the Department assured the community that no Proposition 65 chemicals known to be carcinogenic, have reproductive effects, or that persist in the environment would be used by CDFG to treat Lake Davis. The task force then prepared a plan of 12 specific control measures and techniques that did not involve rotenone (CDFG 2000). After several years of implementing the control measures, it became apparent the methods were ineffective. The northern pike population was rapidly expanding and was substantially degrading the trout fishery and its economic benefits to the community. It was then realized rotenone treatment was the only action that might succeed in eradicating northern pike. Prior to the development of control measures by the task force, a CDFG workgroup of about 30 biologists met in September 1999 to review control options, and concluded that draining of the lake and chemical treatment had the highest probability of success (Lee 2001).

Unlike the 1997 lake treatment project, CDFG conducted extensive public outreach and collaboration with local stakeholders. The result was a rotenone treatment that was accepted by much of the community and was regarded as a collaborative decision by the community and the Department. The project required an extensive environmental analysis. Few, if any, inland fishery projects undertaken by CDFG match the level of staffing, preparation, special funding (millions of dollars), coordinated implementation, and complexity that resulted. Northern pike have not been found in Lake Davis since this treatment; the project and its local collaboration were notable successes.

*Environmental documents.*—Following the 2006 lawsuit by PRC and CBD, the Department completed an EIR in January 2010, thereby complying with court order. The resulting document identified several impacts of the hatchery and stocking programs and provided mitigation measures, many related to how hatcheries would be operated in the future. For trout hatcheries, these measures directed the minimizing of contaminants and pathogens in hatchery discharges, best management practices for minimizing risk of disease transmission to native amphibians, and monitoring of influent and effluent for aquatic invasive species. For stocking practices, measures directed the minimizing of unintentional releases, increased stocking of triploid (i.e., sterile) trout to reduce genetic impacts to steelhead and other native trout, and the preparation of hatchery genetic management plans. Other measures addressed informing anglers about control of invasive species like New Zealand mudsnail (*Potamopyrgus antipodarum*) and minimizing angling impacts to sensitive riparian habitats.

An important measure was defining a systematic approach to the CDFG approval process for trout stocking. The Department developed a pre-stocking evaluation protocol, outlined in Appendix K of the environmental document, which required field surveys to be conducted for the presence of certain sensitive, native species (Decision Species) when a stocking location had been determined to have suitable habitat for the species. The Department has implemented the requirements since 2010; however, the NEPA process is unfinished. Two Biological Assessments, one for the USFWS and one for the NMFS, are approaching completion to fulfill compliance with Section 7 of the ESA. Since implementing of the new measures, the Department now stocks about 30% fewer waters in the state. The net result has been a reduction from approximately 1,200 stocking locations in 2005 to about 800 in 2014.



After release of the Final EIR in 2010, CBD and other plaintiffs filed another lawsuit challenging the adequacy of the EIR, contending that analysis of potential project impacts, formulation of mitigation measures, and identification and evaluation of project alternatives did not meet CEQA requirements. In 2012, a Sacramento Superior Court judge ruled that the EIR fully complied with CEQA. Plaintiffs appealed, and the Appellate Court also found the EIR was adequate under CEQA in January 2015 (N. Murray, CDFW, personal communication).

*Senate Bill 1148, 2012.*—Senate Bill 1148. (SB 1148), introduced by Senator Pavley, had a large focus and influence on CDFG trout management. SB 1148 established direction for both HWTP and hatchery trout programs through revisions and additions to the Trout and Steelhead Management Planning Act of 1979 (Code Section 1725 et seq.) and Code Section 13007 (AB 7). Emphasis in SB 1148 was placed on the importance of managing for native trout, reducing the impacts of stocking hatchery trout on native trout and other native aquatic species, increased emphasis on stocking of native trout, and the importance of integrating stakeholder and public involvement in developing trout management plans and revising the Trout Plan.

For the trout and inland salmon hatchery production program, SB 1148 established new priorities and requirements. Primarily, it required a shift in focus from traditional hatchery trout strains to native trout strains for stocking inland waters. A important aspect to the legislation was the requirement to ensure that all trout stocked for recreational purposes would be sterile through triploidy or other means. Some exceptions were allowed, including for use of surplus brood stock or situations where native trout strains were appropriate for stocking. Department hatcheries had already been using pressure-induced triploidy, but the new law required a rapid expansion of use of this method, development of other techniques, staff training, and acquisition of specialized equipment to meet trout stocking needs. In many cases, new triploid protocols were needed for species for which sterilized eggs had not yet been produced by CDFW, such as inland Chinook salmon (*O. tshawytscha*), brown trout, and brook trout. In other cases, triploidy methods were refined for several strains of rainbow trout, including Eagle Lake rainbow trout, one of the most important hatchery native trout strains stocked widely around the state. The Department commenced on developing new, and revising existing, protocols in 2013.

SB 1148 restated previous legislative direction regarding the importance of wild trout management, cold water habitat protection and restoration, determining appropriate angling regulations for trout waters, and appropriate stocking of hatchery-produced trout. New emphases were placed on prioritizing native trout for stocking and managing wild populations of native trout. Additional requirements for completing and revising wild trout management plans also were included.

The new law also outlined areas of emphasis for the Trout Plan and required updates of the Trout Plan every five years. It required the establishment of an internal department Strategic Trout Management Team to oversee trout management statewide using the framework of the Trout Plan and with responsibility for developing new, watershed-based, trout management plans. The law required management plans and trout stream and lake inventory surveys be made available on the Department's website. A number of education and outreach efforts were also recommended as well as surveys of anglers to determine use, satisfaction, and preferences.

## DISCUSSION

Trout managers have been guided by goals such as the directive to provide and enhance a diversity of angling opportunities found in the Trout Plan. Additionally, managers have sought to respond to the preferences or perceived needs of the trout angling public. In 1990, the daily bag limit for trout was reduced from 10 to five and the size of catchable trout increased from about 6.6 trout/kg to 4.4 trout/kg. This action was in response to the preferences of anglers that the size of fish caught was more important than the number of fish caught, which was determined in part from a survey of inland anglers (Fletcher and King 1988). Other information from the angler survey and changing demographics of California anglers helped guide the Department in establishing an urban fishing program in 1992. This program provided stocked trout and catfish in more easily accessible areas for anglers seeking fishing places closer to home. However, groups like California Trout and TU were not satisfied with their perception of the Department's emphasis on hatchery trout management solutions. In their view, the emphasis on native trout, wild trout management, and habitat protection was lagging and needing greater emphasis by trout managers (White 1989). Not seeing acceptable progress in these management activities led to the 1992 litigation. While this litigation may not have produced the intended outcome, it prompted the Department to produce the Trout Plan. That plan established protection, restoration, and enhancement of coldwater ecosystems as an equal theme with diverse, recreational angling opportunity. Perhaps overdue, these changes in society's values are influencing the direction of trout management (Panek 1997).

The role of rotenone application as a tool in native trout restoration was substantially reduced in California due to the controversy over Lake Davis treatments. Consequently, the use of rotenone to expand and establish new populations of native trout in California was curtailed from 1996 to 2013. A great deal of progress in the restoration of Lahontan cutthroat trout, Paiute cutthroat trout, and California golden trout was hindered as a result. An ironic aspect of the current native trout management strategy is that "to preserve native trout stocks, much effort today is directed at removing the same trout species introduced so enthusiastically by our fisheries forefathers" (Rahel 1997).

California seems to be a proving ground for environmental litigation. When the Department and federal partners tried to implement rotenone treatments called for under the federal recovery plan for the threatened Paiute cutthroat trout in the early 2000s, opponents of rotenone use were able to stall treatment projects in successive years through lawsuits in both state and federal court. While successful in state court, CDFG was stopped in 2005, literally hours from the beginning of a rotenone treatment of Silver King Creek, Alpine County, by a federal judge of the Eastern District of California. The judge later determined the controversy over rotenone was so great that it warranted an EIS to comply with NEPA. It took until 2013 to complete the NEPA process, address new rounds of litigation, and outlast opposition to again use rotenone for native trout restoration.

The major outcomes from the Lake Davis experience for native trout managers in California are the substantial challenges that now must be faced when considering a chemical treatment of rivers, lakes, or reservoirs. Substantial effort must be put forth in pre-project planning and public outreach, in addition to project implementation. The environmental analyses, pre- and post-project monitoring, and environmental compliance now required

are more involved and more costly than the field projects themselves that, ironically, were instrumental in successfully establishing many new populations of native trout in the 1980s and 1990s. Without infusion of new financial and staff resources, the pace of native trout restoration will be much slower compared to past decades.

Legislation, such as AB 7, was intended to provide the budgetary stability for the trout management programs to consistently progress. Ten years later there are still many challenges to meeting hatchery production goals and to accomplishing wild trout resource assessment and management. Litigation and implementation of the Hatchery EIR have not simplified the hatchery trout program's ability to meet the mandates of AB 7 or the new priorities and requirements of SB 1148. Additionally, a consequence of AB 7 is one that challenges the implementation of one of the goals of the Trout Plan: "Improve the effectiveness and efficiency of how hatchery trout are utilized for providing angling opportunities." With a goal that requires over 1.8 million kg of trout produced annually and fewer locations to stock those fish, fishery and hatchery managers are hard pressed to both produce large amounts of trout and efficiently stock them into appropriate waters. The Trout Plan will need to be revised with these new legislative requirements, mandated priorities for native trout, and legal direction from the EIR in mind.

Societal change of increasing perceived value for native species and natural ecosystems have appeared, perhaps at times disconnectedly, in a variety of legislation, litigation, and events that have directed California trout management. These events clearly are having effects. In the high mountain lakes, trout stocking has been discontinued in more than 90% of the lakes that received hatchery fish prior to 1998. California's hatcheries are experiencing a paradigm shift, including changes in their missions to produce more native trout and triploid "recreational" trout. A new direction has been established to produce the right fish, for the right purpose, for the right location. The restoration of native trout is reinvigorated with planning for new chemical treatments and efforts to remove non-native trout with mechanical means (e.g., electrofishing or nets), but with the primary goal of expanding California's native trout populations. The Trout Plan awaits revisions that will capture these directions and reflect new priorities and goals.

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