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SUPERIOR COURT OF THE STATE OF CALIFORNIA
IN AND FOR THE COUNTY OF SACRAMENTO

ENVIRONMENTAL LAW FOUNDATION; PACIFIC COAST FEDERATION OF FISHERMEN'S ASSOCIATIONS; INSTITUTE FOR FISHERIES RESOURCES; and DOES 1-100, Petitioners, vs. STATE WATER RESOURCES CONTROL BOARD, COUNTY OF SISKIYOU; and DOES 1-100, inclusive, Respondents	Case No.: 34-2010-80000583 **SECOND AMENDED PETITION FOR WRIT OF MANDAMUS AND COMPLAINT FOR DECLARATORY AND INJUNCTIVE RELIEF** Dept.: 42 Judge: Hon. Allen Sumner Original Complaint filed: June 23, 2010

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I. INTRODUCTION

1. Petitioners Environmental Law Foundation ("ELF"), Pacific Coast Federation of Fishermen's Associations ("PCFFA") and Institute for Fisheries Resources ("IFR") (collectively "Petitioners") bring this action for a writ of mandate to challenge the pattern and practice of the California State Water Resources Control Board ("SWRCB" or "Water Board") and Siskiyou County ("County") (collectively "Respondents") of failing to manage groundwater resources interconnected with the Scott River in a manner consistent with the Public Trust Doctrine of California. The failures of the SWRCB and the County injure the Scott River as well as the fish and wildlife therein, which are protected public trust resources. Petitioners bring this action on their own behalf, and on behalf of the general public and in the public interest.

2. Respondents SWRCB and Siskiyou County have authority under the Public Trust Doctrine to protect various public trust resources on behalf of the people of California.

3. By continuing to issue permits for wells used to extract groundwater interconnected with the Scott River, without any analysis of the impacts to the Scott River, its public trust uses and resources, Respondent Siskiyou County continues to act in a manner contrary to their duties under the Public Trust Doctrine.

4. Petitioners seek an order from the Court declaring that 1). the protection of groundwater interconnected with the Scott River falls within the Respondents' authority under the Public Trust Doctrine and, 2). this pattern and practice by Respondent Siskiyou County is in violation of the Public Trust Doctrine.

5. Petitioners also seek a writ, enjoining Respondent Siskiyou County's issuance or renewal of well-drilling permits by Respondent Siskiyou County within the Scott River sub-basin for un-adjudicated ground water withdrawals until such a time as the County has established permitting or other management practices that will protect the Public Trust resources of the Scott River.

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II. PARTIES

6. Petitioner ELF is a California 501(c)(3) non-profit organization, formed in 1991,and located in Oakland, California. ELF's legal practice focuses on both Proposition 65 litigation, as well as the protection of water resources in the state of California, including the Public Trust Doctrine. ELF brings this action on its own behalf, as an organization in the state of California, and on behalf of the people of the State of California.

7. Petitioner PCFFA is a California non-profit trade association representing the interests of approximately 1,200 commercial fishing families operating throughout the oceans of the west coast, most of them based in California. Many of PCFFA's individual members derive all or part of their livelihoods from the ocean commercial harvest of Pacific salmon, which traditionally included salmon which originate in the Klamath River (including its tributaries such as the Scott River). Decades of groundwater depletion, and the resultant loss of surface water inflows within the Scott River sub-basin needed to support healthy salmon reproduction in that river system, has destroyed access to, and the biological viability of, much of the Scott River's once-productive salmon habitat. The livelihoods of PCFFA's member associations and their individual members are directly and adversely affected by the loss of coho and chinook salmon production within the now frequently dewatered Scott River. Scott river coho salmon runs, once abundant, have in recent years been so damaged by these excessive and largely unregulated water withdrawals, that those stocks now require protection under the federal Endangered Species Act (ESA), and similar state protection under the California Endangered Species Act (CESA). Under legally required "weak stock management" principles, very weak Klamath salmon stocks such as those from the Scott River can trigger ocean harvest restrictions (or even total closures) over more than 700 miles of coastline, resulting in enormous economic losses to PCFFA members. PCFFA likewise brings this action on its own behalf, as an organization in the state of California, and on behalf of the people of the State of California.

8. Petitioner IFR is PCFFA's closely affiliated sister organization and is a California non-profit public benefit corporation dedicated to the protection and restoration of anadromous fish habitat throughout the region, and in particular in the Klamath Basin. IFR has been working

on salmon habitat restoration in the Klamath Basin, including in the Scott River sub-basin, since its formation by PCFFA in 1992. IFR has invested considerable time, effort and resources over the years toward the restoration of biologically and economically important salmon runs in the Klamath Basin, including in its Scott River sub-basin. Those IFR investments continue to be damaged and jeopardized by largely unregulated groundwater depletion in the Scott River sub-basin which in turn depletes instream flows within the river needed for salmon. IFR also brings this action on its own behalf, as an organization in the state of California, and on behalf of the people of the State of California.

9. Respondent SWRCB is a California agency created under the laws and regulations of the State of California and is a state agency charged with the management of both surface and subsurface water rights and resources, including the management of groundwater interconnected with the Scott River. The SWRCB is also a state agency that has the authority to protect and manage California's waters in a manner consistent with the Public Trust Doctrine. The SWRCB participated in a statutory adjudication of the Scott River's water resources, including the interconnected groundwater, pursuant to Section 2500.5 of the California Water Code, in 1980. Accordingly, the SWRCB shares jurisdiction with Siskiyou County over the management of groundwater resources interconnected with the Scott River.

10. Respondent Siskiyou County is the governmental entity which has a right and duty to govern the permitting of groundwater wells within its jurisdiction in order to protect the health, welfare and safety of the residents of the county. Siskiyou County also has an ongoing and continuing duty to protect public trust resources in a manner consistent with the Public Trust Doctrine. Siskiyou County has adopted a limited groundwater management ordinance and keeps minimal recordation of wells within the County, through a permitting system for well drilling and destruction. Siskiyou County's Public Health and Community Development Department is the specific department that manages the well-drilling and destruction permitting within the County.

III. JURISDICTION AND VENUE

11. This action commences pursuant to the California Code of Civil Procedure § 1085. Plaintiffs have performed all conditions precedent to filing suit or are excused from such conditions.

12. This petition is filed in the California Superior Court in Sacramento. The Superior Court of California has jurisdiction over this case. Venue is proper in Sacramento under California Code of Civil Procedure § 401(1), because SWRCB is a California state agency and venue is proper where the Attorney General has an office. There is an Attorney General's office in Sacramento, and the SWRCB is headquartered in Sacramento.

IV. REQUEST FOR AND DENIAL OF ADMINISTRATIVE RELIEF

13. Petitioners have requested action from Respondents and participated in all administrative actions concerning this claim. Respondents have taken ongoing and final actions contrary to their duties under the Public Trust Doctrine, and Petitioners have exhausted administrative remedies before the filing of this petition.

14. On March 23, 2009 and July 1, 2009 ELF petitioned the SWRCB to review its policies and practices corresponding to the management of the Scott River groundwater resources, and were summarily denied both times in part on the basis that Petitioners were not holders of water rights and on the basis that the SWRCB does not have the appropriate authority over percolating groundwater resources to fulfill Petitioners' requests. Specifically, SWRCB refused to review their policies and practices concerning interconnected groundwater despite Petitioners raising the issue of actual harm to the public trust resources of the Scott River, because of their lack of authority to do so.

15. On July 1, 2009, ELF petitioned Siskiyou County's Public Health and Community Development Department to review its policies and practices corresponding to the management of the Scott River groundwater resources. The County's reply was vague and unresponsive to the issues raised regarding the County's responsibilities under the Public Trust. Respondent Siskiyou County has made few attempts to monitor, manage or limit groundwater

extractions from the Scott River's interconnected groundwater in a way that is consistent with the County's duties under the Public Trust Doctrine.

V. FACTUAL AND LEGAL BACKGROUND

16. The Scott River, located in Siskiyou County, is a public trust resource under California's Public Trust Doctrine. The Public Trust Doctrine establishes that the waters and wildlife of the state belong to the people, and the State acts as a trustee to manage and protect those resources for the benefit of the people of the state. The Scott is a navigable waterway used for boating, rafting and fishing, and provides water supply for domestic and agricultural purposes. It also provides habitat for many fish and wildlife protected under the Public Trust Doctrine, including coho and chinook salmon and steelhead as well as other special status fish and wildlife.

17. The hydrology of the Scott River includes the river and its tributaries, as well as a hydrologic connection between the surface flow and groundwater in the Scott River Valley. The supply of groundwater is inextricably linked and vital to the hydrology of the Scott River, as it contributes to and helps regulate the flow as well as water quality within the Scott River, so it remains a sustainable habitat for aquatic life during the dry summer months. California Water Code § 2500.5 recognizes this, and mandates the inclusion of interconnected groundwater in any determination of water rights to the Scott River.

18. In 1980, the Scott River underwent a water rights adjudication. The adjudication's final order and decree does not affect, regulate or prohibit any wells or sumps to be constructed "at least 500 feet from the Scott River or at the most distant point from the river on the land that overlies the interconnected groundwater, whichever is less." (California State Water Resources Control Board. Jan.16, 1980. Scott River Adjudication, Decree No. 30662 Superior Court for Siskiyou County, 6). No groundwater beyond that 500-foot (or less) zone of adjudication was considered in, is affected by or regulated through the adjudicative process.

19. The Scott River (as well as groundwater within the 500 foot zone of adjudication) is fully appropriated during the irrigation season. However, beyond the zone of adjudication, the

groundwater remains unregulated, unmanaged and unprotected from hundreds of well owners and water users who extract groundwater to either substitute for or supplement surface water allocations. An increasing agricultural trend of growing water-intensive crops in Siskiyou County is encouraged by the lack of regulation over groundwater resources. There is no adequate system in place by either the SWRCB or Siskiyou County to monitor with any accuracy or regularity the extractions of those with groundwater rights under the current adjudication scheme to ensure protection of the public trust consistent with their authority under the Public Trust Doctrine.

20. The physical hydrologic connection between the surface flow and groundwater extends beyond 500 feet from the Scott River, and the extraction of interconnected groundwater that is not affected or regulated by the adjudication, is contributing to the Scott River's current deteriorating environmental condition, and injuring these public trust resources. However, there is no adequate system in place by either SWRCB or Siskiyou County to manage, monitor, limit or regulate groundwater extractions from new or existing wells beyond that zone of adjudication to ensure protection of the public trust or their compliance with their authority under the Public Trust Doctrine.

21. In recent years, the Scott River has experienced a general decrease in base flow during the dry summer months, increases in water temperature and decreases in overall water quality. These conditions have injured the populations of salmon, steelhead and other special status fish and wildlife in the river. Specifically, the decrease in base flow during summer months has injured salmon and steelhead in the Scott River by negatively impacting juvenile rearing, spawning, migration and other vital life cycle processes of the fish.

22. The decrease in flows in the Scott River has now been documented and studied, using data from the Department of Water Resources from over "1,000 well logs, soil and geologic data, groundwater elevations, well tests, . . . stream gage records," and other data. (S.S. Papadopulos & Associates, *Groundwater Conditions in Scott Valley, California*, prepared for Karuk Tribe (Match 30, 2012), at 1 [attached hereto as Exhibit A].) The report concludes that "The Scott River and tributaries can be and have been impacted by increased levels of

groundwater pumping. These impacts, termed 'stream depletion', involve a combination of a reduction in gains to the stream from groundwater and increased seepage losses from the stream to groundwater. . . ." (S.S. Papadopulos & Associates, *Executive Summary*, at ii [attached hereto as Exhibit B].) In other words, the pumping both reduces the groundwater than can flow into the Scott, and actually causes the water in the Scott to fall as it seeps backward into the depleted groundwater. Using historic data that reaches back as far as 50 years, and a verified model, the study reports that stream depletion to the Scott River from both the mainstream and from depletion of its tributaries reaches almost 100% of the amount that is pumped, or nearly 10,000 acre-feet of water per year. (*Groundwater Conditions in Scott Valley, California*, *supra*, at Figure 6.3, "Average Annual Stream Depletion to Scott River and Tributaries from Increased Groundwater Use, Partial Build-Out to Recent Pumping Levels" [Exhibit A].) In other words, essentially every gallon of water pumped from groundwater results in a direct loss of flow of that same gallon in the Scott River. (*Ibid.*) The effect is worst in the irrigation season. (*Id.* at 31 and Figure 6.4.)

23. The same firm also examined the relative contribution to stream depletion from wells located inside and outside the adjudicated zone. (*Stream Depletion Impacts Associated with Pumping from within or beyond the "Interconnected Groundwater" Are as Defined in the 1980 Scott Valley Adjudication*, S.S. Papadopulos & Associates (August 27, 2012) [attached hereto as Exhibit C].) Pumping from wells outside the zone of adjudication results in nearly twice the stream depletion (maximum of 8,000 acre-feet/year) than pumping from wells within the zone of adjudication (maximum of 4,400 acre-feet/year). (*Id.* at Figures 1 and 3.) The report concludes that "The results indicate that the Adjudication Zone as defined in 1975 is too narrowly drawn to meet the objective of identifying areas wherein pumping would have the effect of reducing surface water flows within the same irrigation season." (*Id.* at 4.)

24. As a result of the unregulated pumping of groundwater, particularly outside the zone of adjudication, the Scott River in the past two decades has, with rare exception, been essentially dewatered in the summer and early fall, according to the United States Geological Survey stream gage "11519500 SCOTT R NR FORT JONES CA", which is located immediately

downstream of the irrigated agricultural area of Scott Valley. (Data available at the USGS website by running an analysis of years since 1990: http://waterdata.usgs.gov/ca/nwis/monthly/?referred_module=sw&site_no=11519500&por_11519500_2=2210314,00060,2,1941-10,2013-03&start_dt=1990-01&end_dt=2013-01&format=html_table&date_format=YYYY-MM-DD&rdb_compression=file&submitted_form=parameter_selection_list.) Thus, mean monthly flows for August, September and October since 1990 have been 37, 28 and 56 cubic feet per second. A cubic foot of water is approximately 7.5 gallons of water. Flows this low in a watercourse the size of the Scott are negligible, and appear mostly as a series of pools.

25. Coho salmon inhabiting the Scott River have so diminished in numbers in recent years that they have been protected under the federal Endangered Species Act (ESA) (16 U.S.C. § 1531, et seq.) since May 6, 1997 (62 Fed Reg. 24,588). Scott River coho salmon have also been protected since August 30, 2002 under the California Endangered Species Act (CESA) (Cal. Fish & Game Code § 2050, et seq.). The Scott River has also been federally listed under the ESA as "critical habitat" for ESA-listed coho salmon since May 5, 1999 (64 Fed. Reg. 24,049). The California Fish and Game Commission also adopted a *Recovery Strategy for California Coho Salmon* on February 4, 2004 which contains numerous measures to protect coho salmon in the Scott River basin.

26. Chinook salmon and steelhead also spawn and rear within the Scott River, and their numbers too are today greatly diminished from their historical abundance. Coho, chinook and steelhead public trust resources within the Scott River have continued to diminish since the last Scott River water rights adjudication was completed in 1980.

27. In 1983, the California Supreme Court extended the Public Trust Doctrine's protections to non-navigable tributaries of larger waterways. (*National Audubon Society v. Superior Court*, 33 Cal. 3d 419 (1983)). The Court in *National Audubon* recognized the authority of the State to manage and regulate these non-navigable tributaries to protect these public trust resources.

VI. FIRST CAUSE OF ACTION – Against Respondent SWRCB

(Based on the California Public Trust Doctrine)

28. Petitioners incorporate by reference the allegations in the paragraphs set forth above.

29. The Public Trust Doctrine in California establishes that the waters, stream and lake beds, and fish and wildlife in the State of California belong to the people of California and that the State holds those resources in trust for the people and for future generations. The Public Trust Doctrine confers the authority on the State to protect and manage public trust resources for the benefit of the people of the State.

30. Navigable waters and fish in California are traditional public trust resources held in trust by the State as trustee for the people of California. The Scott River and the resources that are part of and dependent upon the river system are public trust resources.

31. Respondent SWRCB has not exercised its authority over groundwater with a hydrological connection to public trust waters in the Scott River Valley.

32. There is no adequate remedy at law for this injury to public trust resources. Respondents will continue to deny their authority under the Public Trust Doctrine unless a Court finds they have such authority.

33. An actual controversy exists between parties concerning the SWRCB's authority under the Public Trust Doctrine. Petitioners contend that the SWRCB has authority under the Public Trust Doctrine to manage and protect groundwater resources that are hydrologically connected to public trust waters. Respondent SWRCB denies it has the authority to protect percolating groundwater resources even if they are hydrologically connected to public trust waters. Petitioners request a judicial determination of the SWRCB's authority to protect groundwater which is hydrologically connected to navigable, public trust waterways, under the Public Trust Doctrine of California. Declaratory relief is necessary and appropriate, and Petitioners respectfully request it at this time.

34. Petitioners do not request a re-opening of the 1980 adjudication. Whether that is deemed a necessary step by the SWRCB to managing and regulating groundwater pursuant to the

State's duties under the Public Trust Doctrine is not an issue before this Court.

VII. <u>SECOND CAUSE OF ACTION – Against Respondent Siskiyou County</u>

(Violations of the California Public Trust Doctrine)

35. Petitioners incorporate by reference the allegations in the paragraphs set forth above.

36. Siskiyou County, as the entity permitting wells used to extract groundwater from aquifers interconnected with surface waters (which are not subject to the Scott River adjudication), has a duty under the Public Trust Doctrine to protect and manage such interconnected groundwater to preserve surface water flows. This duty was articulated by the California Supreme Court in *National Audubon* in its recognition that non-navigable tributaries that are interconnected with navigable public trust waters must themselves be managed to protect the public trust waters under the Public Trust Doctrine. Furthermore, the California Supreme Court imposed a continuing duty to so review and, if necessary, change the management of those tributaries to protect the resource. Respondent, Siskiyou County failed to uphold this duty by neither monitoring nor regulating not limiting extractions of groundwater that are not subject to the 1980 adjudication, nor undertaking any review of whether changes to their current practice regarding well-drilling permits are necessary to fully protect the public trust resources in the Scott River.

37. Siskiyou County has never completed a detailed or comprehensive scientific study to determine whether excessive groundwater pumping, and consequent aquifer depletion, is occurring within the Scott River sub-basin, and thus the County has no way of knowing, much less of controlling, any adverse impacts from such groundwater pumping on aquifer levels generally, on interconnected surface water flows to the Scott River from the aquifer, or on fish and wildlife within the Scott River that are caused, or may be caused, by continuing to issue well permits in that sub-basin. There is, however, increasing evidence of such adverse impacts on interconnected instream flows that the County continues to ignore in deciding whether or not to issue new well permits (for wells not part of the adjudication).

38. By the conduct (or lack thereof) described above, Respondent Siskiyou County is allowing destruction of the Scott River itself and the fish therein, which are public trust resources under California's Public Trust Doctrine. Specifically, the County is failing to protect the Scott River from numerous and injurious extractions of interconnected groundwater through their pattern and practice of issuing new well drilling permits (not subject to the adjudication), without any analysis of the impacts those potential groundwater extractions could have on the Scott River. In turn, these groundwater extractions are causing injury to the Scott River and the fish and wildlife therein.

39. Respondent Siskiyou County's failure to protect the Scott River from numerous and injurious extractions of interconnected groundwater beyond those permitted by the adjudication, causing injury to the Scott River and the populations of fish and wildlife therein, violates the Public Trust Doctrine. As a result, Respondent Siskiyou County is causing irreparable harm to the Petitioners and the people of the State of California.

40. There is no adequate remedy at law for this injury to public trust resources. Respondents will continue to neglect their duties under the Public Trust Doctrine unless ordered by the Court to do otherwise.

41. Unless Petitioners are granted relief as set forth herein, they will suffer irreparable harm in that Respondents' pattern and practice in failing to manage groundwater resources interconnected with the Scott River in a manner consistent with the Public Trust Doctrine, and without any analysis as to the impacts of groundwater extractions on the Scott River and the fish and wildlife therein, is injuring public trust resources to the detriment of Petitioners, to public trust resources and to the people of the State.

42. Petitioners request that no new permits to drill additional wells, should be issued by Respondent Siskiyou County for any applications for sites within the Scott River sub-basin for waters not adjudicated in the 1980 Scott River Adjudication, until the interconnected zone has been determined and the County has put in place a permit or management plan for such wells that will proactively and affirmatively protect the public trust resources of the Scott River sub-basin.

VIII. PRAYER FOR RELIEF

1. An order from the Court declaring that groundwater which is hydrologically connected to navigable surface flows, protected by the Public Trust Doctrine, must be managed and protected in a manner consistent with the Public Trust Doctrine.

2. Alternative and peremptory writs or preliminary and permanent injunctions compelling Respondent Siskiyou County to cease the issuance of well drilling permits for groundwater not previously adjudicated within the Scott River sub-basin until such time as they are not in violation of their public trust duties.

3. Costs of suit, expenses, including reasonable attorney fees according to the California Code of Civil Procedure § 1021.5, and other provisions of law; and

4. Such other and further relief as the Court deems appropriate.

Executed on the 13th day of September, 2013 at Oakland, California.

ENVIRONMENTAL LAW FOUNDATION

PROOF OF SERVICE

I, Nicole Feliciano, hereby declare:

I am over the age of 18 years and am not a party to this action. I am employed in the county of Alameda. My business address is Environmental Law Foundation, 1736 Franklin Street, Ninth Floor, Oakland, CA 94612.

On October 2, 2013, I caused to be served the attached:

SECOND AMENDED PETITION FOR WRIT OF MANDAMUS AND COMPLAINT FOR DECLARATORY AND INJUNCTIVE RELIEF

__X__ BY MAIL. I caused the above identified document(s) addressed to the party(ies) listed below to be deposited for collection at the Public Interest Law Offices or a certified United States Postal Service box following the regular practice for collection and processing of correspondence for mailing with the United States Postal Service. In the ordinary course of business, correspondence is deposited with the United States Postal Service on this day.

I declare under penalty of perjury, under the laws of the State of California, that the foregoing is true and correct, and that this Declaration was executed at Oakland, California on October 2, 2013.

N. Feliciano

Nicole Feliciano
DECLARANT

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Exhibit A

Groundwater Conditions in Scott Valley, California

S.S. PAPADOPULOS & ASSOCIATES, INC.
Boulder, Colorado

March 2012

3100 Arapahoe Avenue, Suite 203, Boulder, Colorado 80303-1050 • (303) 939-8880

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1.0 INTRODUCTION

This report describes groundwater conditions in the Scott Valley (Figure 1.1), located in Siskiyou County, California, and the development of a groundwater model representing the alluvial aquifer that can be used to investigate groundwater/surface-water interactions. The goal of this work is to improve understanding of the relationship between land and water use on flow conditions in the Scott River.

The groundwater model is applied to examine groundwater conditions given recent levels of groundwater use, and under an alternative water use condition representing partial build-out of the existing groundwater capacity. The partial build-out case, in comparison to the recent condition case, provides a mechanism for examining the impacts of groundwater pumping on the aquifer and on the Scott River. Many other scenarios can be evaluated through specification of alternative conditions to the model input packages. For example, scenarios may be structured to examine how the location and timing of groundwater diversion and use, or how managed recharge, might enhance late season flows of the Scott River.

This work is based on extensive data presently available in the public record, including over 1,000 well logs, soil and geologic data, groundwater elevations, well tests, high-resolution land surface elevation data, crop and riparian vegetation mapping, climatological data and stream gage records. The groundwater model provides a reasonable representation of existing conditions and is a useful tool for examining broad questions related to groundwater use in the Scott Valley. The groundwater model may be updated and refined as additional information is obtained. Focused data investigations may be particularly useful for improved assessment of specific scenarios or improved understanding of localized conditions.

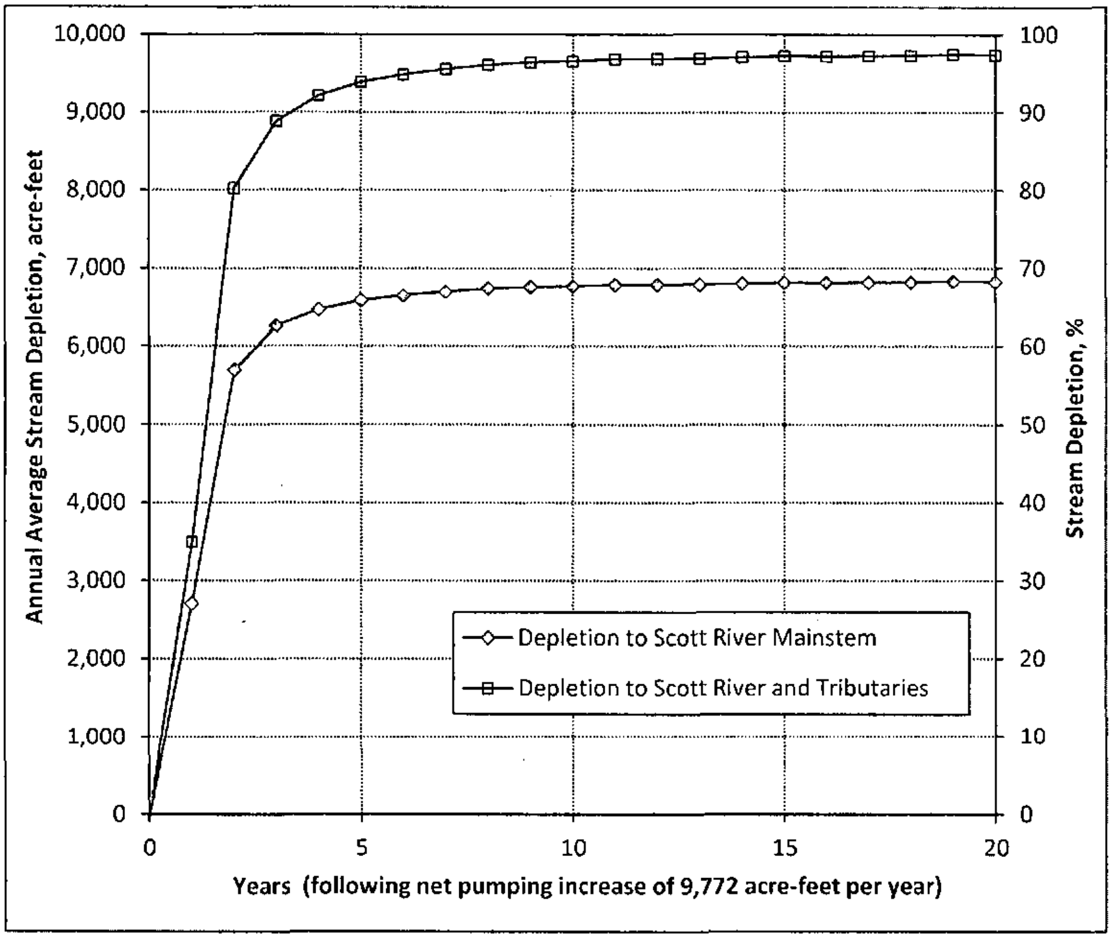
partial build-out and recent condition. This gradual decline would be superimposed on seasonal or annual fluctuations that otherwise occur.

Figure 6.2 shows the simulated change as it progresses seasonally for a 10-year period due to the step-change increase in pumping at selected well locations with long-term records. Minimum differences occur at the end of the non-irrigation/recharge season, with declines within a range of about 0.5 to 1.5 feet. Declines of this magnitude would be difficult to detect, particularly with the pumping increase occurring gradually over a decade or more, and considering inter-annual climate fluctuations. Declines during late summer months are more pronounced, largely because of the timing of irrigation pumping. Simulated, incremental, summer declines range from under 2 feet to about 4 feet at the locations shown. Declines increase over the first few years following the step-change in pumping, and then reach an oscillatory steady-state condition, with minimal change from year to year. In the historical period, assuming that a transition occurred from the partial build-out to the recent condition over a period of one or two decades, the change would have been more gradual, but the end result, essentially as shown. As noted before, these pumping-induced declines would be superimposed on seasonal or annual fluctuations that otherwise occur.

The range of incremental declines simulated, and as shown on Figure 6.1 and 6.2, are within a range expected based on review of long-term trends reflected in the data available to this study. Additional data exist for wells monitored in recent years under a voluntary monitoring program. A request to review and consider these data for this study was declined by the Siskiyou RCB in June 2011. If these data are made available to this study at a later date, they will be considered in model updates/refinements.

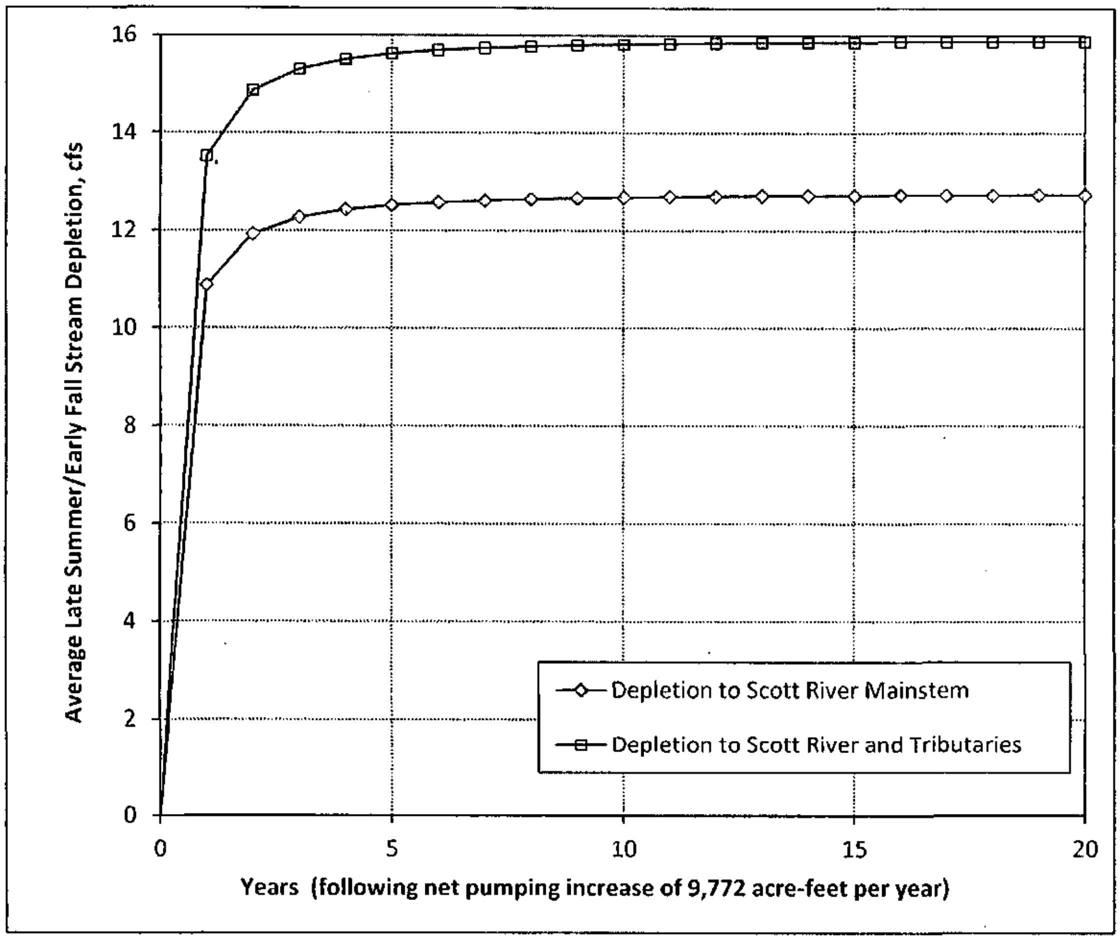
Figure 6.3 shows average annual stream depletion to the Scott River and tributaries in acre-feet per year, and as a percentage of the net pumping increase, resulting from the step-change from partial build-out to recent water use conditions. Most of the simulated depletion results from reduced groundwater inflow to the streams (reduced "gains"). This depletion relationship can be used to examine lagged impacts of a gradual increase in pumping or other pumping schedules with the same spatial distribution of groundwater

Figures



Note: The net increase in pumping is simulated as occurring as a single step; the resulting curve can be used to identify lagged depletion impacts from a gradual change in pumping

Figure 6.3 Average Annual Stream Depletion to Scott River and Tributaries from Increased Groundwater Use, Partial Build-Out to Recent Pumping Levels



Note: The net increase in pumping is simulated as occurring as a single step; the resulting curve can be used to identify lagged depletion impacts from a gradual change in pumping

Figure 6.4 Late Summer/Early Fall Stream Depletion to Scott River and Tributaries from Increased Groundwater Use, Partial Build-Out to Recent Condition

Exhibit B

EXECUTIVE SUMMARY

A groundwater study of the Scott Valley, Siskiyou County, California, was conducted to improve understanding of the relationship between land and water use on flow conditions in the Scott River. This work is based on extensive data presently available in the public record, including over 1,000 well logs, soil and geologic data, groundwater elevations, well tests, high-resolution land surface elevation data, crop and riparian vegetation mapping, climatological data and stream gage records. As part of this work, a high-resolution groundwater model of the Scott Valley has been prepared, suitable for characterization of valley-wide groundwater conditions and groundwater/surface-water interactions.

Two model simulations were conducted to illustrate the model capabilities and to provide insight on groundwater conditions in the Scott Valley. The groundwater model was applied to examine groundwater conditions given recent levels of groundwater use, and under an alternative water use condition representing partial build-out of the existing groundwater capacity. The "partial build-out" case, in comparison to the "recent" case, provides a mechanism for examining the impacts of groundwater pumping on the aquifer and on the Scott River. While pumping and water use vary somewhat from year to year, depending on cropped acreage, crop distribution, weather and water supply conditions, these two cases are taken as representative of two distinct development conditions and provide a basis for examining hydrologic conditions and relationships within the alluvial aquifer. These cases are identified for illustrative purposes and can be modified or refined in future scenario evaluations.

Simulation of water use under the "recent" condition sets groundwater pumping at the amounts estimated and summarized by the California Department of Water Resources (DWR) for the year 2000. Simulation of water use under "partial build-out" of well capacity sets groundwater pumping at an amount reflecting 60% of the well capacity available in the year 2000, and adjusts irrigation recharge accordingly. Pumping and irrigation-related recharge are pro-rated based on crop classes and spatially assigned to the model in accordance with mapped GIS coverages. Other sources of recharge, including mountain-front recharge and winter stream flows, are based on average conditions for the period 1971 to 2000. The "recent" condition reflects a net increase in groundwater use of approximately 9,800 acre-feet per year as compared to the "partial build-out" condition.

While structured as a hypothetical, the "partial build-out" pumping condition would have occurred at some point in the past. Based on drilling dates of the well logs available to this study, this condition would likely have occurred in or around the early 1980s. A review of monthly estimates of applied groundwater developed by DWR suggests that a 60% reduction in well capacity would potentially limit the application of irrigation water from wells in the months of June through September, but have little impact on groundwater usage in May.

The groundwater model, as configured for these illustrative simulations, tracks changes to groundwater elevations and surface-water/groundwater interactions through four distinct seasons, although monthly or other time intervals could be incorporated in future scenarios. The model simulation results were examined to identify differences in groundwater elevations and to quantify stream depletion impacts associated with the net change in groundwater use between the "partial build-out" and "recent" water use condition. The following conclusions were drawn from this analysis:

- Simulation results are generally consistent with observed water-level data, including long-term trends at wells monitored over a period of decades.
- Groundwater elevations in winter are minimally affected by long-term pumping. Groundwater elevations in late summer/early fall have been subject to declines on the order of a few feet, depending on location. (Groundwater elevation declines due to pumping are superimposed on seasonal or annual fluctuations that can be of much greater magnitude.)
- Groundwater declines from pumping tend to be greater in the outlying areas of the basin including upland gulches; similarly, groundwater elevation increases from recharge events may be more pronounced in these areas.
- The Scott River and tributaries can be and have been impacted by increased levels of groundwater pumping. These impacts, termed "stream depletion", involve a combination of a reduction in gains to the stream from groundwater and increased seepage losses from the stream to groundwater, depending on location and time of year.
- Stream depletion can occur from pumping at any location within the Scott Valley; however, the magnitude and timing of impacts to the river or tributaries depends on the amount, duration, location and depth of pumping.
- The model has been applied to generate a stream depletion relationship for the existing basin-wide distribution of pumping which shows that, in composite, increases in groundwater pumping are conveyed to equivalent reductions in streamflow within approximately five years, with the bulk of the impact occurring in the first year or two.
- The simulated net increase in pumping between the "partial build-out" condition (approximately, 1980s) and the "recent" condition (2000) indicates a corresponding stream depletion impact of approximately 16 cfs during the late summer season, July through September. The stream depletion is a change that would be superimposed on surface water flows resulting from the combination of other inflows and outflows, including run-off, ambient stream gains/losses, surface diversion and return flow.
- Higher stream depletion impacts occur during the summer than during the winter/early spring period, reflecting the seasonal occurrence of irrigation pumping.
- The stream depletion impact resulting from changes in groundwater use prior to the partial build-out condition, i.e., from the 1950s to the 1980s, was not quantified as part of this study.

- The magnitude of stream depletion resulting from an increase in groundwater pumping from "partial build-out" conditions to "recent" conditions is consistent with the observed reduction in baseflow of the Scott River over recent decades, adjusted to account for climate impacts.

The groundwater model provides a reasonable representation of existing conditions and is a useful tool for examining broad questions related to groundwater use in the Scott Valley. Many other scenarios can be evaluated through specification of alternative conditions to the model input packages. For example, scenarios may be structured to examine how the location and timing of groundwater diversion and use, or how managed recharge, might enhance late season flows of the Scott River. Scenarios might involve recharge ponds, modification of pumping locations or schedules, alternate irrigation application methods or other approaches for increasing aquifer recharge.

The groundwater model may be updated and refined as additional information is obtained. Focused data investigations may be particularly useful for improved assessment of specific management scenarios or improved understanding of localized conditions.

Exhibit C

Σ²Π S. S. PAPADOPULOS & ASSOCIATES, INC.
Environmental & Water-Resource Consultants

Memorandum

Date: August 27, 2012

From: Deborah L. Hathaway

To: Craig Tucker, Klamath Coordinator, Karuk Tribe

Subject: **Stream Depletion Impacts Associated with Pumping from within or beyond the "Interconnected Groundwater" Area as Defined in the 1980 Scott Valley Adjudication**

Introduction

This memorandum describes an analysis of stream depletion impacts associated with pumping from two areas within the Scott Valley. One area is that within the zone of "Interconnected Groundwater" as delineated in the 1980 Scott Valley Adjudication. The second area is the area of alluvial fill within the Scott Valley that falls outside of the boundaries of the above-referenced zone. The analysis uses the Scott Valley Groundwater Model prepared by S.S. Papadopulos & Associates, Inc. (July 2012).

Background

The 1980 Scott Valley Adjudication (Decree 30662, Superior Court for Siskiyou County, 1980) provided limits on the development of new groundwater uses within a zone of "Interconnected Groundwater", defined as (Paragraph 4):

> "all ground water so closely and freely connected with the surface flow of the Scott River that any extraction of such ground water causes a reduction in the surface flow in the Scott River prior to the end of a current irrigation season. The surface projection of such interconnected ground water as defined herein is that area adjacent to the Scott River as delineated on the SWRCB map in the reach from the confluence of Clarks Creek and Scott River to Meamber Bridge."

The SWRCB map is later referenced (Paragraph 12) as the map entitled "Scott River Stream System showing Diversions and Irrigated Lands, Siskiyou County, 1979", comprised of 20 sheets.

The "Zone of Interconnected Groundwater" shown on the the 1979 map was initially published by the California State Water Resources Control Board, 1975, in a report entitled "Report on Hydrogeologic Conditions, Scott River Valley". The 1975 report discusses characteristics of valley alluvial materials referencing information on driller's logs, including the driller's description of lithology and specific capacity derived from initial pumping. From this information, the author makes inferences as to where pumping from groundwater might be expected to impact the river within the same season. The author did not make stream depletion calculations or otherwise quantify impacts to support delineation of the "Zone of Interconnected Groundwater". Nor did the author consider the cumulative depletion impact that would result from lagged stream impacts following the cessation of pumping in the non-irrigation season that subsequently accrue in the following irrigation season. While the delineation reflects a qualitative mapping of coarser versus finer alluvial sediments, the process does not support a conclusion that pumping from beyond the zone would not result in a stream depletion impact within the same irrigation season or in future years.

Stream Depletion Analysis of Pumping within and beyond the Adjudication Zone of Interconnected Groundwater

In order to provide a quantitative assessment of stream depletion impacts from pumping within the Scott Valley, both within and beyond the zone of Interconnected Groundwater (Adjudication Zone), two scenarios were evaluated using the Scott Valley Groundwater Model (S.S. Papadopulos & Associates, 2012):

- Stream Depletion Impacts of Irrigation Wells beyond Adjudication Zone
- Stream Depletion Impacts of Irrigation Wells within Adjudication Zone

The runs are based on distribution of irrigation wells to correspond with the location and amount of irrigated acreage as mapped for the year 2000. In structuring a stream depletion simulation, ratios of stream depletion can be derived from any change in pumping quantity. In this case, the amounts selected correspond to the difference between the amount pumped under the Partial Build-Out and the Recent Pumping Level cases described in the Scott Valley Groundwater Model report (S.S. Papadopulos & Associates, Inc., 2012). The stream depletion impact is calculated as the difference in net stream losses/gains between the two simulations, which differ only in the amount of irrigation pumping within the zone of interest. Figures 1 through 4 illustrate the results of this stream depletion analysis.

Figure 1 shows the annual average stream depletion in acre-feet associated with pumping outside of the Adjudication Zone. The simulated, incremental, amount of irrigation pumping between the Partial Build-Out and the Recent Pumping Level case is 8,177 acre-feet per year. Figure 1 shows the depletion to the Scott River and the total depletion to the Scott River and tributaries. In the first season of pumping, the total stream depletion is greater than 25% of the pumped volume; in the second season, the total stream depletion exceeds 75% of the pumped volume. Approximately 60 to 65% of the impact accrues to the Scott River mainstem with the remainder accruing to the tributaries. By the seventh year of pumping, stream depletion impacts are nearly equal to the amount of pumping. Figure 2 shows results of the same simulation expressed in terms of cubic feet per second in the late summer/early fall period. This amount is associated with the incremental simulated pumping of 8,177 acre-feet per year as noted above, averaging about 11.3 cubic feet per second. The impact in the late summer/early fall period approaches 12 cubic feet per second, reflecting the fact that impacts are greater during this season due to the timing of pumping.

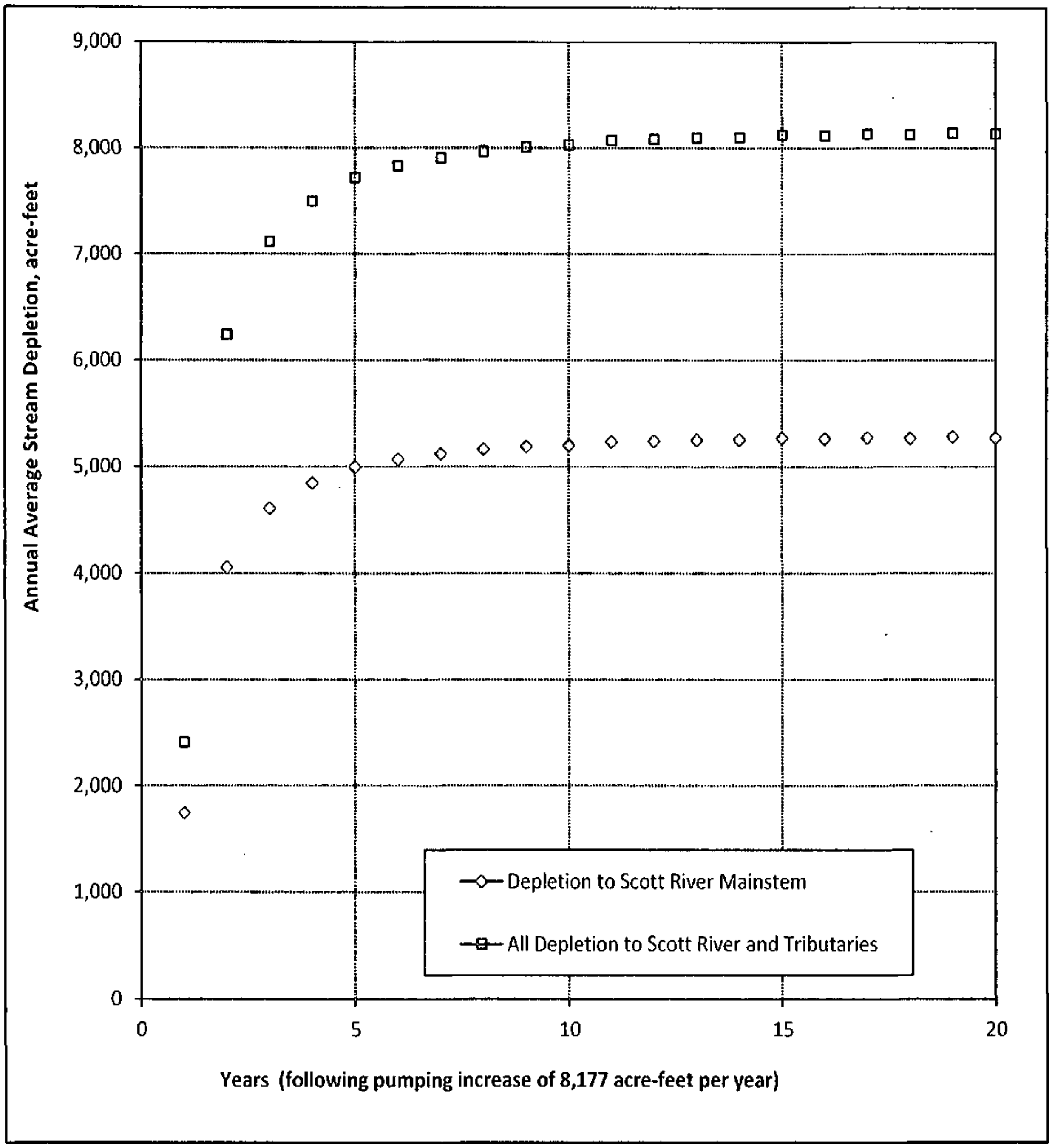
These results can be used to characterize the stream depletion as a proportion of pumping for a set of wells that are distributed outside of the Adjudication Zone throughout the existing irrigated areas. The stream depletion from any specific well will vary, some being higher and some being lower than the composite, or average, effect shown on Figure 1 and 2 for all wells beyond the Adjudication Zone. Generally speaking, these results can be extended to other pumping amounts by scaling the impact according to the change in pumping, assuming that the spatial and temporal distribution of pumping remains the same. For example, if pumping were to increase or decrease by 20% from the quantity simulated here, the impacts would correspondingly increase or decrease by 20%.

Figures 3 and 4 show stream depletion impacts for pumping within the Adjudication Zone. In these cases, the change in pumping (corresponding to the difference between the Partial Buildout and Recent Condition cases) is simulated as 4,348 acre-feet per year. As would be expected, pumping from within the Adjudication Zone has a more rapid impact on the Scott River and tributaries due to the coarser sediments and the closer proximity to the streams. The stream depletion impact is about 45% of pumping within the first year and rapidly increases, being nearly equal to the pumping amount within a period of 3 to 4 years. Approximately 80% of the depletion impact accrues to the Scott River mainstem with the remainder accruing to the tributaries.

Summary
This quantitative analysis of stream depletion impacts from pumping groundwater within and beyond the Adjudication Zone using the Scott Valley Groundwater Model illustrates the proportion of pumping that can be expected to impact the streams over a multi-year period under average seasonal conditions. The seasonal conditions include winter and spring recharge, mountain-front recharge, recharge from irrigation percolation and groundwater pumping to supplement surface water in meeting crop demand.

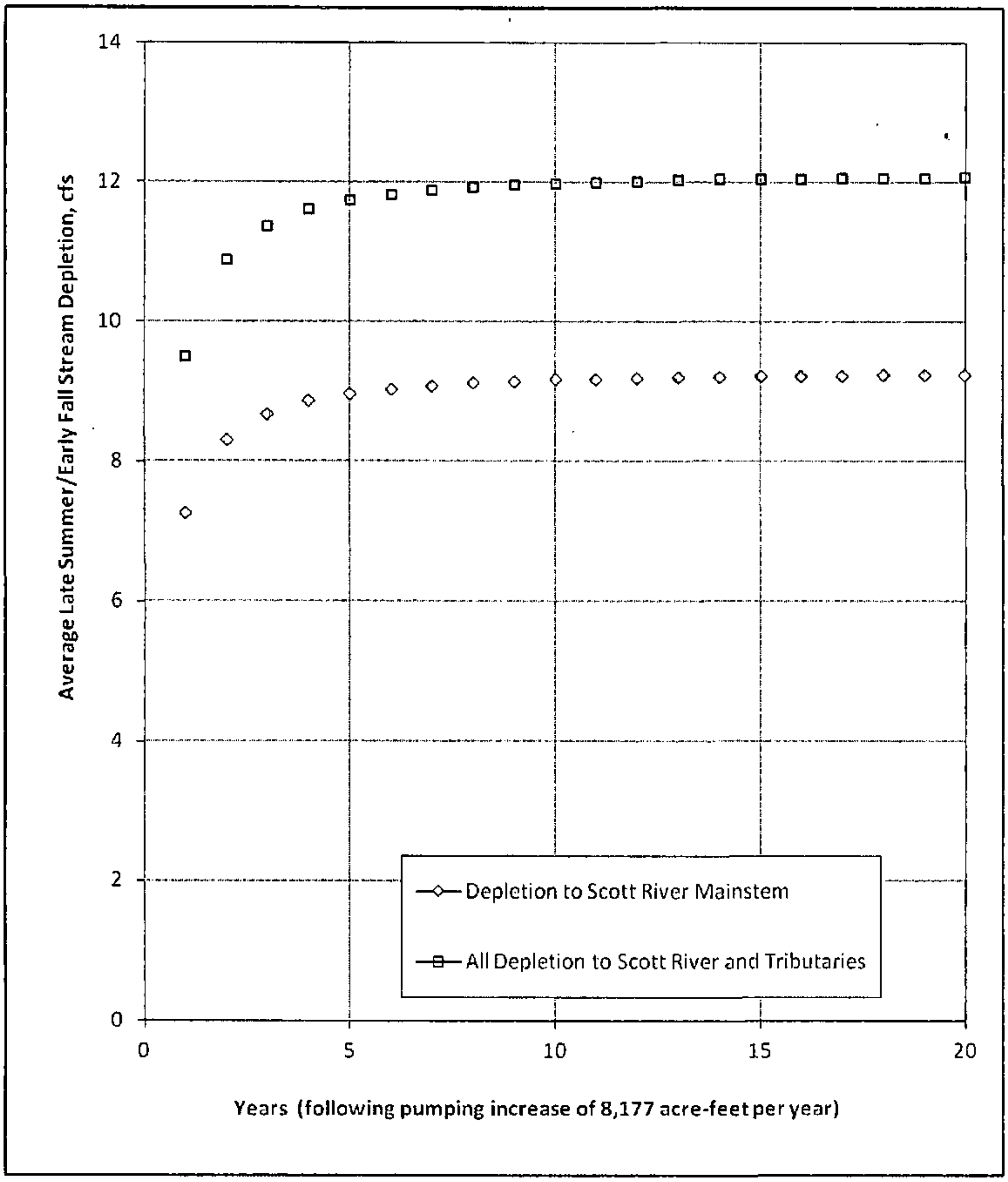
Figures 1 through 4 illustrate the stream depletion impacts from distributed pumping from within and beyond the Adjudication Zone. In both cases, stream depletion impacts are evident within the first season of pumping and increase thereafter. Pumping from within the Adjudication Zone rapidly reaches a steady-state condition with nearly all pumping offset by impacts to the flow in streams within a matter of 3 to 4 years. Approximately 80% of the depletion impact accrues to the Scott River mainstem with the remainder accruing to the tributaries. Pumping from beyond the Adjudication Zone also impacts the Scott River and tributaries, with a higher proportion of impacts accruing to tributaries than as seen for pumping from within the Adjudication Zone. Approximately 60-65% of the impact accrues to the Scott River mainstem with the remainder accruing to the tributaries.

The results indicate that the Adjudication Zone as defined in 1975 is too narrowly drawn to meet the objective of identifying areas wherein pumping would have the effect of reducing surface water flows within the same irrigation season. Furthermore, the results indicate that despite the cessation of pumping during the non-irrigation season and the occurrence of recharge, that stream depletion impacts continue to accumulate over time and have the potential for significantly higher impacts than are seen within the first or same season of pumping.



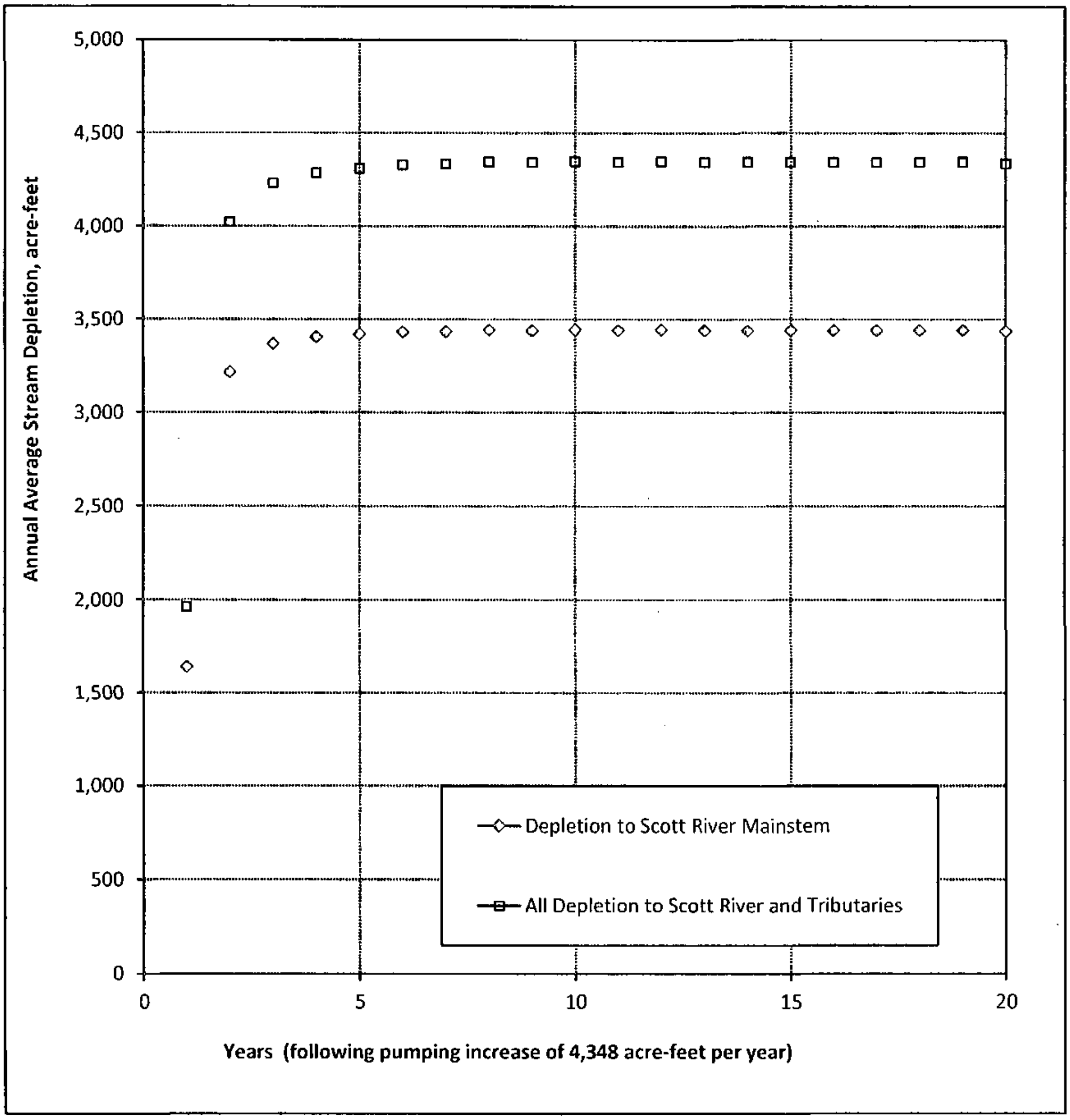
Note: The net increase in pumping is simulated as occurring as a single step; the resulting depletion curve can be used to identify lagged depletion impacts from a gradual change in pumping.

Figure 1. Stream Depletion Impact to Scott River and Tributaries from Increased Groundwater Use, Outside of Adjudication (1980) Interconnected Groundwater Zone



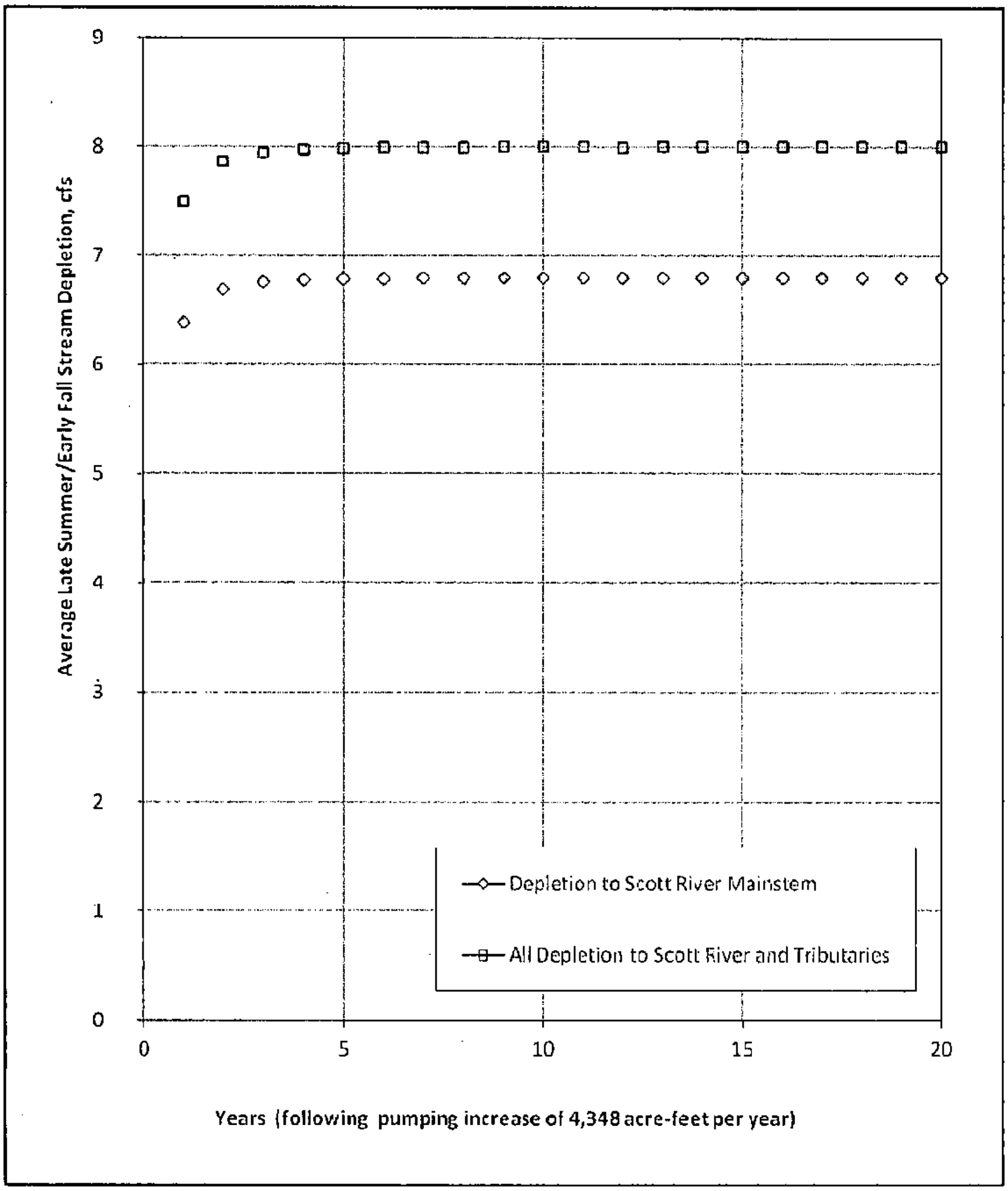
Note: The net increase in pumping is simulated as occurring as a single step; the resulting depletion curve can be used to identify lagged depletion impacts from a gradual change in pumping

Figure 2. Late Summer/Early Fall Stream Depletion Impact to Scott River and Tributaries from Increased Groundwater Use, Outside of Adjudication (1980) Interconnected Groundwater Zone



Note: The net increase in pumping is simulated as occurring as a single step; the resulting depletion curve can be used to identify lagged depletion impacts from a gradual change in pumping.

Figure 3. Stream Depletion Impact to Scott River and Tributaries from Increased Groundwater Use, Inside of Adjudication (1980) Interconnected Groundwater Zone



Note: The net increase in pumping is simulated as occurring as a single step; the resulting depletion curve can be used to identify lagged depletion impacts from a gradual change in pumping

Figure 4. Late Summer/Early Fall Stream Depletion Impact to Scott River and Tributaries from Increased Groundwater Use, Inside of Adjudication (1980) Interconnected Groundwater Zone