Appendix 1-4

Public Comments Received on Draft Plan

From: Chris Shutes <blancapaloma@msn.com>
Sent: Monday, September 12, 2016 6:25 PM
To: uhinman@comcast.net; Cindy Noble
Cc: Dave Steindorf
Subject: Additions to IRWM report Chapter 3
Attachments: 3. DRAFT Region Description 8-5-16_BF CS v2 090916.DOCX

Flag Status: Flagged

Dear Uma and Cindy,

I have added several pages of copy relating to upper Feather watershed fisheries. They are in jRedline [underline/strikethrough] format. You can find them on what is now pages 3-20 to 3-25. Like Cindy, I believe it is important to have a more complete description of these fisheries and their history. They are important to the watershed and to the County.

Dave added a few changes relating to hydropower settlements on what is now page 3-57. Dave also suggested a couple of photos, such as a photo of Curtain Falls on the American Whitewater website. However, I did not include those, in part for formatting reasons, and in part because of file size.

I have tried to avoid controversial statements and to be as objective (and frankly, positive) as possible. I provide cites in footnotes; you may wish to pull some of the information out of the footnotes and put it in the References section at the end of the chapter or document.

Please feel free to contact me if you have any questions.

Thanks,

Chris Shutes

Chris Shutes
FERC Projects Director
California Sportfishing Protection Alliance
(510) 421-2405

(Comments excerpted from full Word version of chapter)

3.4.4 Aquatic Ecosystems and Fisheries

The Upper Feather River Watershed has a wide variety of aquatic habitats including natural ponds and lakes, reservoirs and canals, springs and meadows, small alpine streams, and large, canyon-bounded rivers. The fisheries of the watershed are also varied with numerous species of native and non-native fish occupying the varied habitats. Fisheries in the watershed can be generalized into two categories: cold water streams and rivers, and cold and warm water lakes and reservoirs.

The transitional geology of the Feather River basin includes extensive Cascadian formations that provide widespread springs. These springs supply substantial year-round cold-water summer baseflow to many streams and rivers. The largest and most important springs in the upper Feather watershed are the Big Springs on the North Fork Feather River, which were inundated in 1914 by Lake Almanor. These springs, whose water originates from as far away as the southern slopes of Mount Lassen, provide between 800

and 1000 cubic feet per second (cfs) of year-round flow. Many other springs in the watershed also provide important year-round sources of cold water to such waterways as the upper North Fork Feather River upstream of the current Lake Almanor, the Hamilton Branch of the North Fork Feather River, Butt Creek, Yellow Creek, and many smaller streams.

Historical Salmon and Steelhead in the Upper Feather Watershed

Historically, the Upper Feather River Watershed provided spawning habitat to anadromous Chinook salmon (*Oncorhynchus tshawytscha*) and steelhead (*Oncorhychus mykiss*), that migrated from the Pacific Ocean to spawn in the headwaters streams of the Feather River. The North Fork Feather provided the greatest and most productive anadromous fish habitat, with salmon reaching as far upstream as about two miles above Seneca, and in some cases to the present location of Lake Almanor.[1] Curtain Falls on the Middle Fork Feather posed a barrier to upstream migration. The South Fork Feather featured ample spawning habitat, but irrigation diversions near the current high water mark of Oroville Reservoir blocked passage on the South Fork Feather before 1929.[2]

The construction of Big Bend Dam in 1910 to serve the Big Bend powerhouse 11 miles downstream partly blocked the migration of salmon and steelhead on the North Fork Feather River. Although there was a fish ladder over Big Bend Dam, water was bypassed out of the river into pipes, and the North Fork Feather was at times largely dewatered for these 11 miles during periods of relatively low water.[3]

The Oroville Dam now blocks the upstream migration of salmonids at a point further downstream. Oroville Reservoir inundated much of the remaining salmonid spawning habitat, particularly for spring-run Chinook and steelhead. Ocean-run salmonids are no longer present in the watershed above the dam. The Feather River Fish Barrier Dam, located just downstream of Oroville Dam, now diverts migrating salmon and steelhead to the Feather River Fish Hatchery Ladder, where they are collected for artificial spawning. One-year-old hatchlings are released into the Feather River or transported downstream to the Delta where they migrate to the Pacific Ocean until returning to the lower Feather River to spawn as adults.[4]

~~Fisheries in the Upper Feather River Watershed are managed by the California Department of Fish and Wildlife (CDFW) and the DWR. Fisheries management has included stocking and removals at several locations in the watershed, and introduced game species have migrated into most streams and lakes in the watershed.~~

There have been proposals by the National Marine Fisheries Services (NMFS) to reintroduce steelhead and salmon to the North Fork Feather River watershed through a trap and haul program, but the current

[1] Yoshiyama, Ronald et al., (2001) Historical and Present Distribution of Chinook Salmon in the Central Valley Drainage of California, Fish Bulletin 179: Volume One, p. 124. Available at: http://www.dfg.ca.gov/fish/REsources/Reports/Bulletin179_V1.asp. Last checked September 8, 2016.
[2] Id., pp. 125-126.
[3] Frank Brehm, Feather River Stairway of Power, http://www.wplives.com/frc/stairway_of_power.html, last checked September 8, 2016. Also, Wales, J.H., and Hansen, H.A., 1952, The Effect on the Fishery of the North Fork Feather River, California, of Proposed Hydro-Electric Developments, with Special Reference to Cresta and Rock Creek Projects, p. 1 (pdf p. 15). Available at: http://calsport.org/news/wp-content/uploads/20150327-5212-Wales-and-Hansen-Report.pdf. Last checked September 8, 2016. By 1952, Wales and Hansen noted no presence of salmon or steelhead in the North Fork Feather upstream of Big Bend.

[4] ESF, 2005, p. 4-29.

Habitat Expansion Agreement between NMFS, DWR, and PG&E has moved away from the North Fork Feather River watershed--at least for the present.[5]

Tribal representatives advocate for restoring salmon and other native fish species in the watershed of the Upper Feather River region. The Maidu people are proponents of working in collaborative stewardship to assist in fish restoration, utilizing cultural knowledge and including historical precedence and traditional practices for fostering fish passage.

North Fork Feather River Fisheries and Hydropower Development

Following the extirpation of salmon and steelhead from the North Fork Feather, the river nonetheless remained one of the premier recreational trout fisheries in California. Prior to the completion of Highway 70 up the [North Fork] Feather River Canyon in 1937, anglers came on the Western Pacific Railroad to fish the North Fork.[6] Wales and Hansen reported in 1952 that, there were eleven fishing resorts along the North Fork prior to the completion of the Rock Creek – Cresta Hydroelectric Project in 1950. Estimated angler days in 1946 were 36,000, and estimated annual catch of trout was 108,000.[7]

The fishery changed dramatically with the construction and operation of the Rock Creek – Cresta Project. The new a flow regime on the Rock Creek and Cresta reaches left only 50 to 100 cfs in the river, diverting all the rest into tunnels leading to the powerhouses. This "bypass" of 90-95% of the river flow was relieved only during power system outages and periods of uncontrolled high flows. By 1989, the trout fishery on both the Rock Creek and Cresta reaches had been severely diminished, and warm water fish had largely displaced trout. Chemical treatments removed most of the fish in these reaches in 1966 and again in 1977, but the benefit to trout was small and short-lived.[8] By 1982, there was little spawning gravel left in the Rock Creek and Cresta reaches of the North Fork. Much gravel had been captured by forebay dams along the river.[9] Gravel introduced from tributaries was washed into downstream reservoir during high flow events.

The North Fork fishery began a reset in 2001 with the Federal Energy Regulatory Commission's (FERC) relicensing of the Rock Creek – Cresta Project. Under the Rock Creek – Cresta Settlement Agreement that grew out of the relicensing, streamflows were improved and water temperatures were slightly improved. Although trout are still outnumbered by warm water species in both the Rock Creek and Cresta reaches, trout abundance has increased, and fish greater in length than 17" are regularly reported. Implementation of catch-and-release, no-bait angling regulations, while not universally obeyed, has also helped to sustain the fishery. In 2007, PG&E completed an artificial spawning channel near its facility at Rodgers Flat on the Rock Creek reach, and monitoring shows steadily increasing use by rainbow trout. Gravel augmentations in several tributaries on the reach have also achieved measurable improvements at relatively low cost. Currently, the Forest Service is planning passage improvements to several additional tributaries along the

[5] Plumas Co. 2009. p. 20.
[6] Wixom, Lynn, 1989, North Fork Feather River Fisheries Management Plan. California Department of Fish and Game. Available at: http://www.waterboards.ca.gov/water_issues/programs/tmdl/records/region_5/2006/ref717.pdf. Last checked September 10, 2016.
[7] Wales and Hansen, op cit., pp. 10-11 (pdf pp. 24-25).
[8] Wixom, op. cit., p. 6.
[9] Id, p. 7

Rock Creek reach and on the East Branch of the North Fork.[10] Two fishing guides have Forest Service use permits for the North Fork Feather.

Upstream of the Rock Creek – Cresta Project is the Upper North Fork Feather Hydroelectric Project, which includes the 1.13 million acre-foot reservoir Lake Almanor, as well as Butt Valley Reservoir and the Seneca and Belden reaches of the North Fork Feather River. Lake Almanor, Butt Valley Reservoir and Caribou I Powerhouse at the bottom of the Seneca reach were developed in the early 1900's. Butt Valley Powerhouse on Butt Valley Reservoir, Caribou II Powerhouse adjacent to Caribou I, and Belden Powerhouse just upstream of Rock Creek Reservoir were added in 1958. This project also went through relicensing in the late 90's and early 2000's, and a partial settlement agreement was signed in 2004.

Lake Almanor is the most prolific and most popular fishery in the upper Feather watershed. Its cold-water species feature rainbow trout, brown trout and land-locked Chinook salmon. The lake also features warm-water species, notably smallmouth bass. The sportfish population is supported by wakasagi, Japanese pond smelt imported to California, that provide a forage fish base for larger species, as well as by a rich insect life including the very large Hexagenia mayfly. The pond smelt in particular promote rapid growth of the trout, salmon and bass. Lake Almanor features nine licensed fishing guides and many resorts, businesses and campgrounds that cater to anglers. A locally sponsored net-pen rearing program for juvenile fish, located near the mouth of the Hamilton Branch, augments fish plantings by the California Department of Fish and Wildlife. The Upper North Fork Feather Settlement Agreement includes a lake level agreement to protect the fishery, visual quality and other values of Lake Almanor from rapid drawdown of the lake during the summer.

Butt Valley Reservoir, southwest of Lake Almanor, is formed by a dam on spring-fed Butt Creek. However most of its water comes from a PG&E pipe that moves water from Lake Almanor (at Prattville) through Butt Valley Powerhouse, located at the upper end of Butt Valley Reservoir. The reservoir supports a popular fishery of large trout, as well as bass, both of which feed on pond smelt.

From Butt Valley Reservoir, water is released through enormous pressurized pipes ("penstocks") down to the Caribou powerhouses located on the North Fork Feather River at the bottom of the Seneca reach, 10.8 river miles downstream of Lake Almanor's Canyon Dam.[11] The FERC-required flow release from Canyon Dam into the North Fork Feather is only 35 cfs. All the rest of the water from Lake Almanor passes through Prattville and Butt Valley Reservoir. Largely because water heats considerably in Butt Valley Reservoir, the water that enters the North Fork Feather downstream of the Seneca reach and the Caribou powerhouses is thus much warmer than it was under pre-project conditions.

Because it is in a deep, shaded canyon, and because it draws water from near the bottom of Lake Almanor, the Seneca reach of the North Fork Feather is cold, and features a good trout fishery. However, since more than 95% of its flow is diverted, the former river is now more a mid-size mountain stream. Access to most of the reach is limited and difficult.

[10] Information on the Rock Creek – Cresta Project since 2001 was developed from PG&E's annual reports to FERC on the operation of the Rock Creek – Cresta Project. See for example the 2015 Annual Report at FERC's eLibrary, www.ferc.gov, accession no. 20160524-5131.

[11] This description of the Upper North Fork Feather Project is derived from FERC, November 10, 2005, Final Environmental Impact Statement for the Upper North Fork Feather Project, Project No. 2105-089. Available at FERC's eLibrary, www.ferc.gov, accession no. 20051110-4000.

The Belden reach of the North Fork Feather, downstream of the Caribou powerhouses, is regulated by Belden Forebay, a small reservoir into which the two Caribou powerhouses discharge their outfall. The regulating reservoir allows PG&E to maintain a relatively constant flow in the river downstream, even though the powerhouses are ramped up and down at different times to meet various needs on the power grid. As with the other reaches of the North Fork Feather below Almanor, most of the water is piped around the Belden reach, and only rejoins the river at the outfall of Belden Powerhouse, just upstream of Rock Creek Reservoir. The Belden reach is easily accessible from Caribou Road, and the California Department of Fish and Wildlife maintains the reach as a put and take fishery through stocking. However, vegetation encroachment into the stream channel, the result of lack of flushing flows, makes it hard to get to the river along much of the reach.

Neither the FERC relicensing of the Upper North Fork Feather Project, nor the Upper North Fork Settlement Agreement addressed water temperature. The State Water Resources Control Board was left the difficult problem of improving water temperatures in the North Fork Feather River through its issuance of a Water Quality Certification for the relicensing of the Upper North Fork Feather Project. The State Board issued an Environmental Impact Report in November, 2014, that analyzed an option to install a "thermal curtain" at PG&E's Prattville intake. However, this approach has been universally reviled in Plumas County due to concerns that this facility would pull the cold water out of the lake and harm the lake's trout fishery. Due in large part to the overwhelming negative response in the county, State Board staff is preparing a new EIR for release in 2017.

Poe Project downstream of Cresta Powerhouse

Cresta Powerhouse discharges its outfall into Poe Reservoir, from which a tunnel diverts water down to the Poe Powerhouse, upstream of the high water mark of Oroville Reservoir. The Poe reach of the North Fork Feather River is a transitional in temperature, reliably cold only for one to two miles at the top of the reach. The Poe reach is noteworthy for its robust population of foothill yellow-legged frogs (rana boylii), a Forest Service species of special concern. In some years, surveys conducted by consultants to PG&E have detected over foothill yellow-legged frog egg masses during the late spring breeding season. This population is one of the most robust in the Sierras, and will be a management priority in the soon-to-be-issued Water Quality Certification for the relicensing of the Poe Project and in the implementation of the new FERC license itself.[12]

Middle Fork Feather River: Wild and Scenic Gem

Over 70 miles of the Middle Fork Feather River were designated under the Wild & Scenic Rivers Act in 1968, and 30 river miles are inaccessible by road.[13] The Middle Fork features an excellent rainbow trout fishery over much of its length, and a several fishing guides work its waters. Downstream of Mohawk Valley, access is largely by walk-in or kayak. A road provides access to anglers and kayakers at Milsap Bar.

Davis Lake

Davis Lake north of Portola is a reservoir on Grizzly Creek, one of the highest elevation tributaries of the Middle Fork Feather River. Davis Lake is heavily planted with rainbow trout by the Department of Fish and Wildlife as both a put-and-take and put-and-grow fishery. Davis Lake features some of the fastest growth

[12] For further documentation of foothill yellow-legged frogs on the Poe reach, see Annual Reports for the Rock Creek – Cresta Project, as cited above.

[13] See https://www.rivers.gov/rivers/feather.php. Last checked September 10, 2016.

rates in California, due in part to aquatic snails in its food base. Davis Lake is very popular both among fly and spin anglers, and several guides work its waters with their clients.

Fisheries Summary

There are many other notable fisheries in the upper Feather watershed. The North Fork Feather upstream of Lake Almanor and Bucks Lake warrant mention. Spring creeks such as Yellow Creek and many smaller spring creeks offer a variety of fisheries, as well as enhancement and restoration opportunities.

Fisheries in the Upper Feather River Watershed are managed by the California Department of Fish and Wildlife (CDFW) and the DWR. Fisheries management has included stocking and removals at several locations in the watershed, and introduced game species have migrated into most streams and lakes in the watershed.

There are currently ~~17~~ 18 common fish species known to occur in the Upper Feather River Watershed,[14] of which 13 are non-native (Table 3-5). The actual extent and distribution of these species is generally unclear.

Table Error! No text of specified style in document**.-1 Common fish species in the Upper Feather River Watershed IRWM Plan Area**

Common Name	Scientific Name
Rainbow Trout	*Oncorhynchus mykiss*
Rainbow Trout	*Oncorhynchus mykiss*
Eagle Lake Rainbow Trout	*Oncorhynchus mykiss aquilarum*
Eastern Brook Trout	*Salvelinus fontinalis**
Brown Trout	*Salmo trutta**
Lake Trout (Mackinaw)	*Salvelinus namaycush**
Chinook salmon (landlocked)	*Oncorhynchus tshawytscha*
Kokanee Salmon	*Oncorhynchus nerka**
Carp	*Cyprinus carpio**
Channel Catfish	*Ictalurus Punctatus**
Hitch	*Lavinia exilicauda*
Speckled Dace	*Rhinichthys osculus*
Brown Bullhead	*Ameiurus nebulosus**
Bluegill	*Lepomis macrochirus**
Redear Sunfish	*Lepomis microlophus**
Green Sunfish	*Lepomis cyanellus**
Black Crappie	*Pomoxis nigromaculatus**
Largemouth Bass	*Micropterus salmoides**
*Non-native	

3.6.1.2 Hydroelectric Infrastructure

The other most notable infrastructure is PG&E's Stairway of Power, a series of ten hydroelectric projects on the North Fork of the Feather River stretching from Lake Almanor to Lake Oroville (Figure 3-10).[15] The

[14] ESF, 2005.
[15] Plumas Co. 2009. p. 19.

East Branch of the North Fork of the Feather River serves over 4.36 million electrical customers through its hydroelectric facilities. Lake Almanor is a very popular water-based recreation destination in the West.

The PG&E operations in the Upper Feather River Region are governed largely by the terms of licenses issued by the Federal Energy Regulatory Commission. A settlement agreement and the license were completed for Project 1962 (Rock Creek/Cresta) in 2000, and a settlement agreement was completed for Project 2105 (Lake Almanor) in 2004. The license for Lake Almanor is currently under review by the State Water Resources Control Board for purposes of a Clean Water Act Section 401 water quality certification. Licenses for Project 2107 (Poe), Project 2088 (South Feather) and Project 2100 (Oroville) are also pending, and Project 619 (Bucks Lake) began relicensing in 2012.[16]

The settlement agreements for FERC Projects No. 1962, No. 2100, ~~No. 2107~~, and No. 2105 are included as some of the underlying "mandatory plans" in the 2005 IRWM Plan. These plans include conditions that provide improved flows for fish habitat and recreation. The agreements also include investments in recreation infrastructure. The settlement agreement for Project 2105 includes significant upgrades to campgrounds around Lake Almanor. The Oroville Settlement has a total mitigation package valued at a billion dollars.

[16] Ibid., p. 30.

Water and Resource Conservation Paul Gosselin, Director

308 Nelson Avenue
Oroville, California 95965

T: 530.538.4343
F: 530.538.3807

buttecounty.net/waterresourceconservation
bcwater@buttecounty.net

September 9, 2016

Upper Feather River IRWM RWMG (RWMG)
UFR.contact@gmail.com

Dear Members of the RWMG:

Butte County would like to express our concern on the draft Upper Feather River Integrated Regional Water Management Plan (Plan) in three areas:

1) The plan was released on August 15, with a 30-day comment period. This is of concern because this in no adequate time for a review by staff and a report to our Board of Supervisors. If the RWMG had included Butte in their distribution of the plan chapter by chapter, which was the manner in which other stakeholders were informed, we may have been able to respond in a shorter amount of time.

2) There is reference in the plan to a Memorandum of Understanding (MOU) between the County of Butte and the RWMG having been signed. This MOU is still in review and has not been signed by either Board of Supervisors at the time the Plan was released.

3) Butte County would like to work with the RWMG on projects that are located within our jurisdictional authority and would like to appeal to the RWMG to include the Butte in future discussions. Since a great portion of our county is included within your plan, we believe that our input will be valuable and should be taken into consideration.

These issues are all resolvable, but Butte County feels compelled to include them in this comment period to ensure that they are taken seriously and that we are included in the process.

Thank you for this opportunity to comment on the Plan.

Sincerely,

Paul Gosselin, Director
Butte County Water and Resource Conservation

From: Sherri Norris <sherri@cieaweb.org>
Sent: Thursday, September 15, 2016 3:57 PM
To: 'Uma Hinman'
Subject:TAC_tribal_input_9-14-2016
Attachments: TAC_tribal_input_9-14-2016.docx

Hi Uma here are the changes!

Thank you!!!!

IRWM Draft Plan Review Notes

3.3.3 - 4th paragraph Honey Lake Maidu

3.3.3 – last paragraph:

Maidu practitioners engaged in active management of ecological diversity including optimizing the health of plant and animal species, forests, and water through a continued intense relationship with the landscape. The surrounding environment provided all of the necessary nourishment, medicine, recreation, and spiritual development for thriving human communities. Intense interaction to ensure optimum health was practiced including the use of landscape scale burning.

The watershed is severely impacted by mining, dams, hydroelectric production, agriculture, roadways, climate change, forestry practices, lack of active management, mining toxins, and changes in land use.

Not sure where this would go:

Specific areas of concern include the Middle Fork beginning in Sierra Valley, Little Last Chance Creek, Red Clover Creek, Squaw Queen Creek, Little Indian Creek, Lights Creek, Hamilton Branch, the North Fork of the Feather River draining into Lake Almanor, the small tributaries and springs draining into Lake Almanor, Mud Creek, Yellow Creek, and Indian Jim in the Feather River Canyon. These small creeks and their tributaries represent areas directly affected by erosion and climate change, greatly affecting water quality downstream.

Non-native species have been introduced into the waterways threatening and outcompeting native species.

Intro under Governance Structure:

The Upper Feather River IRWM values Traditional Ecological Knowledge (TEK) and is working to integrate these values into each project.

3-14

Tribes and tribal communities within Butte County have strong interests in the Upper Feather River IRWM. This includes the areas around Pulga, Lake Concow, Lake Oroville, Feather Falls, and the rivers up to Bucks Lake.

Regional Description:

Maidu depended on interactions with each other as well as surrounding tribes. Benefits of these interactions included shared resources, trade relations, and strengthened family ties. Through current policy and governance there has been a severe disruption in tribal relationships within the Maidu tribes as well as with other tribes.

7-7-2.1

63 Legacy methyl-mercury contamination of fish and wildlife originating from the Gold Rush in legacy gold mines, mine features, and hydroelectric and SWP reservoirs is of special concern for tribes, Audubon Society members, and the Water Boards. A Mercury TMDL proceeding is planned for the region during the next five to ten years to address toxins affecting water quality, human health and that of aquatic plants, animals, birds and fish.

From: Cindy Noble <cindy.noble@frtu.org>
Sent: Wednesday, August 17, 2016 3:32 PM
To: Uma Hinman
Subject:More about Fishery for IRWMP plan
Attachments: upper_feather_fisheries_writeup.docx

-------- Forwarded Message --------
Subject:
RE: [CAUTION: Suspicious Link]IRWMP help PLEASE
Date: Tue, 16 Aug 2016 17:07:54 +0000
From: Mayes, Christopher T -FS <ctmayes@fs.fed.us>
To: Cindy Noble <cindy.noble@frtu.org>

Hi Cindy - I looked over the Fisheries section, and I agree that it's a little skimpy. I've attached a little write-up describing stream, lake, and reservoir fisheries up here. I could write pages on this stuff, but I think you guys are looking for something brief. Pick-and-pluck what you'd like out of it.

The table in this section is missing at least two common fish species: Sacramento sucker (Catestomus occidentalis) and Sacramento pikeminnow (Ptychocheilus grandis). These two native species are extremely common throughout the Feather River watershed. It might be good to include Sacramento perch on there as well, given their listing as a CA Species of Special Concern and the only native centrarchid west of the Rockies.

Hope this helps!

Chris Mayes
Fisheries Biologist
Forest Service
Lassen National Forest, Almanor Ranger District
p: 530-258-5176
ctmayes@fs.fed.us
900 Hwy 36 E
Chester, CA 96020
www.fs.fed.us

In general, headwater stream habitats in the Upper Feather River watershed support various salmonid species (rainbow, brown, and brook trout) and freshwater sculpin (Cottus spp.). As one travels downstream and water temperatures increase, brown and brook trout become sparse and native species such as Sacramento sucker, Sacramento pikeminnow, and hardhead become more abundant. Summer water temperatures in main stem streams/rivers are generally higher than historic averages primarily due to dam/reservoir construction that slows water flow. As a result, many stream reaches below dams that were historically dominated by cold-water species are now shared between cold- and warm-water species, or are entirely dominated by warm-water species.

Lake and reservoir fisheries mostly consist of introduced/non-native species, and are highly varied across the watershed. Most lakes above 5,000 feet elevation are considered cold-water habitat and support salmonids such as rainbow, brown, brook, and lake (mackinaw) trout. California Department of Fish and Wildlife (CDFW) supports most lake/reservoir salmonid populations through stocking efforts, though many reservoirs with sufficient cold water inflows to allow for spawning support self-sustaining populations of salmonids. Lakes and reservoirs below 5,000 feet are typically warmer than those above this elevation, and non-native species such as smallmouth bass, largemouth bass, brown bullhead, and various sunfish species are present along with salmonids. Non-salmonid species such as smallmouth and largemouth bass are self-sustaining where present. Native species such as Sacramento pikeminnow, Sacramento sucker, and California roach also utilize reservoir habitats, and these reservoirs tend to support these species at higher elevations than they would normally be found. At least three reservoirs in the watershed (Mountain Meadows Reservoir, Lake Almanor, and Butt Valley Reservoir) support Sacramento perch, the only sunfish species native west of the Rocky Mountains and listed as a California Species of Special Concern.

Stream, lake, and reservoir fisheries in the Upper Feather River watershed are very popular with anglers, and visiting anglers can be a significant source of revenue for the rural communities situated near these fisheries. As a result, local communities view fisheries management within the Upper Feather River watershed as a high priority, with many communities actively engaged with CDFW in helping to provide improved sport fishing opportunities in area streams, lakes, and reservoirs.

Feather River Trout Unlimited # 905
P.O. Box 278
Graeagle CA 96103

Uma: Cindy Noble asked that we provide a brief overview of issues affecting native fish in the Feather River. This information is derived from the fish assessment for the Basin currently underway by our Chapter and the Sierra Institute.

Fish Issue Summary

The Feather River watershed above Oroville dam once supported diverse and productive fish communities. A combination of anthropogenic activities have functionally removed over 150 miles of anadromous fish stream habitat from the Basin and degraded hundreds of miles of native freshwater fish habitat.

Poor watershed conditions have long been recognized by the public and resource managers. Considerable resources have been invested to improve conditions but broad-scale improvements to fish habitat from prior restoration efforts have been limited.

A collaborative (Trout Unlimited, Sierra Institute, Plumas, Lassen and Tahoe National Forests and California Department of Fish and Wildlife) assessment of fish distribution and habitat conditions is currently underway. Preliminary results have identified several common problems in the watershed that could be addressed by improvement efforts. These problems include:

> **Fish Passage:** the presence of numerous barriers to fish passage. Most of these barriers are associated with roads on forested land in both public and private ownership. Others are the result of State Highways and Railroads crossings and hydro-electric and other water development infrastructure.
>
> **Fish Stranding:** There are numerous water diversions throughout the watershed, especially in the large meadow systems now currently the site of ranching and agriculture associated with cattle production. Very few of the diversions are screened which leads to the entrainment of trout in ditches and other irrigation infrastructure, and commonly leads to stranding of these fish.
>
> **Road Erosion:** Most sub-watersheds the watershed have high road densities. Most of the roads were built before the impact of roads on stream processes was fully understood. Most are unsurfaced, many are poorly drained, and many have road stream crossing with the potential to divert stormflows unto roadways. As such, they alter both sediment and flow regimes and negatively impact fish habitat. Other facilities that produce similar effects in the watershed are state and county roadways, and railroad beds.

Vegetation with High Risk of Sustaining Severe Wildfire: Fire is an integral element of Sierra forest ecosystems. Unfortunately, suppression of fire over the past hundred years has altered natural fire regimes. The result is fires that burn at higher severity than in the past. In the short term, large fires with a high percentage of high severity burn have devastating effects on trout and trout habitat. Ground cover is removed, resulting in accelerated erosion, large wood recruitment to channels is disrupted and stream temperatures are increased.

Pathogens: At least one fish pathogen (Whirling Disease) is known to occur in the watershed, with devastating impacts to rainbow trout. The ability of pathogens to expand their range is poorly understood. The potential for pathogens needs to be considered in any improvement activity intended to benefit native fishes.

Non-Native Species: The basin has seen wide spread introduction of non-native fish species. While introduced trout species are valued by anglers, they do compete with native rainbow trout. As suitable habitat is constricted by climate change, the interaction between these species may become a problem for the sustainability of native populations.

Water Diversions and Releases: The Feather River Watershed's water regime has been significantly altered, especially along the river's main stems and in the large valleys. With the exception of the Middle Branch, river flows have been altered by storage and manipulated release of flows for hydroelectric production. Reservoirs in the headwaters also store water. Flows below these facilities are highly altered. Diversions for irrigation are prevalent in the project area's large valleys. Water rights were adjudicated in most of these valleys before adequate consideration for in stream flow needs was realized.

Habitat Connectivity: The combination of barriers, degraded habitat, reduced stream flows and increased temperatures may pose threats to the connection between habitats needed to sustain genetic diversity of the species.

Prepared by Ken Roby, Mike Kossow and Vincent Rogers

You can reach Ken at robyfamily@frontiernet.net or 284-6534

Feather River Trout Unlimited # 905
P.O. Box 278
Graeagle CA 96103

TU Feather River Chapter offers the following comments on the Public Review Draft of the Upper Feather River IRWM Update.

Generally comments follow excerpts from the draft document to which the comment pertains. We first provide a few general comments.

The plan contains goals, objectives, strategies and actions. Also a climate change evaluation. It was difficult for us to see how these sections were intended to fit together. Did the climate change evaluation influence project selection? Did the strategies influence the objectives, or vice versa? As it reads now, the plan contains numerous, independent sections. A description, including a schematic of how the sections were intended to fit together (how the plan "works") would be helpful to the reader.

3.4.6-Invasive species

There is no discussion of invasive aquatic species, which pose a serious threat to native species and in some cases, water development infrastructure.

3.5.1 Watershed descriptions

These descriptions are essentially physical descriptions. They appear to add nothing in terms of applying sensitivity or condition considerations to development of projects, strategies or objectives. Therefore, it is unclear why they are included in this document. It seems that space could be saved by summarizing information in a table, if the information is needed.

On a specific note, Yellow Creek is infected with Whirling Disease, which has had devastating effects on the rainbow trout population there. No mention is made of this. Again, as these descriptions do not contribute to project development, we would drop the section.

3.7.1-

"Water quality concerns are identified when monitoring data exceeds the standards set to protect beneficial uses. Some stream segments are listed as "impaired" by various contaminants. Impairment means that a standard of water quality for beneficial uses (for example, as a source of drinking water or for recreation or industrial use) is not being met. The federal Clean Water Act requires states to maintain a listing of impaired water bodies for the purpose of establishing Total Maximum Daily Loads (TMDLs). A TMDL is a calculation of the maximum amount of a pollutant that a waterbody can receive and still meet water quality standards, and an allocation of that load among the various sources of that pollutant."

Comment: This is an administrative definition of water quality. "Concerns" are much broader for the basin. There are a large number of areas where beneficial uses are impaired by pollutants, very few of

these are monitored. The most common pollutants in the basin are sediment and increased temperature. Impacts are widespread. The description of the situation is very poor.

The description, focused on regulation, also misses the point that non-point sources of pollution (again, common for sediment and temperature) are not managed with Waste Discharge Permits, but through the application of Best Management Practices.

As the plan goes into discussion of specific water quality constituents (arsenic, etc.) in the discussion of ground water, it seems some expansion of surface water, to include discussion of at least sediment and temperature would be warranted.

4.2.2

Issue: *Tree encroachment into meadows*.

Stream incision caused by changes in flow regimes leads to drying of montane meadows by lowering the water table and severing the hydrologic connection between the stream and surrounding uplands. Many meadows have been invaded by conifer species, which lowers the water table further and contributes to continued drying of the meadows.

Comment: We would agree that stream incision lowers water table, etc. It is arguable the incision was caused by changes in flow regimes. Typically it is the result of overgrazing, or some physical manipulation of the channel (road crossings). We also question if the vegetation is causing the water table level, or reacting to it. We think this issue would be better addressed in terms of meadow process and function rather than targeting the vegetation.

Issue: *Loss of fisheries habitat*.

Water flows in the watershed are highly regulated by the Department of Water Resources (DWR) and Pacific Gas & Electric (PG&E) for hydroelectric purposes and water storage for downstream users. In addition to creating insurmountable fish barriers, some of the hydroelectric dams on the Feather River create shallow reservoirs (i.e., Rock Creek and Cresta) that result in increased water temperatures. Increased water temperatures and the loss of channel pools, the loss of riparian vegetation and undercut banks, increased sediment loads, and seasonal drying of streams from decreased water retention in upland watersheds have resulted in loss of fisheries habitat throughout the region.

Comment: The hydro facilities in the Feather River Canyon are barriers, and degrade fish habitat locally. This description however, seems to indicate they are the primary problem in the watershed. In fact, the problem of fish barriers is widespread- a conservative guess is that 75% of all road crossings are barriers to fish. Water diversions are over prescribed, so there is little water left in channel for fish. As above, temperature increases are common. There are also introduced non-native fishes and pathogens. The description here of upland water retention is probably overstated. Has anyone documented loss of habitat due to this process?

Issue: *Need for better grazing management on public lands*.

Grazing on lands in the upper watershed may lead to changes in the vegetation, i.e., away from grass and forb communities that have high water retention and toward shrub communities with lower water retention. Livestock may also cause soil compaction, disturbance to wetlands, physical damage to streambanks, and waste pollution.

Comment: Why is this aimed exclusively at public lands? We could point to poor practices on some private lands as well.

Issue: *Loss of wildlife habitat*.

Riparian corridors are beneficial for maintaining wildlife diversity, and function as an interface between aquatic and terrestrial habitats. Riparian buffers are also important in filtering runoff from meadows and pastures, which protects water quality. **A majority of the montane riparian habitat in the UFR watershed is unprotected from conversion to other land uses**, and is fragmented by inconsistent land management practices. Fencing off riparian corridors, providing off-site watering, and implementing improved grazing strategies are ways in which agencies and private stakeholders can work collaboratively to help enhance this vital habitat for wildlife while protecting the interests of private landholders.

Comment: Is the bolded sentence true? Seems like the amount in USFS ownership, plus that under Conservation Easement to FRLT might represent a majority.

Issue: *Deteriorating and inadequate recreational facilities*.

Recreational facilities, including forest roads, are often poorly located and poorly maintained. Roads, campgrounds, and trails located in seasonal wetlands and meadows can cause erosion, pollution, and channelization of runoff. Forest roads are the largest source of sediment in the watershed. Many roads were designed without adequate erosion control measures and have become rutted and gullied, which further accelerates sediment discharge. Additionally, as the economy transitions from the traditionalresource base towards tourism, more and better managed recreational facilities will benefit the region.

Comment: It is unclear why the heading for this section is “inadequate recreational facilities”. Roads are transportation facilities, and there really should be a separate heading for roads. They represent the primary source of erosion in the watershed. Additionally, road crossings are frequently a barrier to the passage of aquatic organisms and contribute to loss of habitat connectivity. You also have not commented on t he influence of roads on flood peaks and stream flows. Roads at crossings deliver storm flow to channels that would otherwise infiltrate. Add up all the crossings and it represents a lot of water.

Issue: *Declining water quality*.

Increased water temperatures, sedimentation, reduced dissolved oxygen, and potential toxins from aging debris dams (historic gold mining) **remain as primary reasons** for declining water quality in the watershed. While some progress has been made towards improvement, it has not removed the threat posed to aquatic species. Building on existing monitoring efforts by DWR and Plumas Corporation, in addition to outreach and education, could lead to increased awareness of the issues and a framework to guide future water quality improvement efforts.

Comment: Temperature, etc are indicators, they are not reasons. The reasons, as you list in other locations, are past grazing, roads, wildfire, etc.

Issue: *Timing of water storage and release*.

Water storage and release for uses such as agriculture, hydroelectric generation, and flood control are often incompatible with the needs of natural ecosystems. The natural hydroperiod of streams has been altered, resulting in accelerated seasonal drying of tributaries and increased "flashiness" due to decreased retention in the upper watershed, unseasonal peaks in lower reaches due to releases for hydroelectric generation, and reduced seasonal flood peaks in lower reaches.

Comment: This section should be rewritten and broadened to include water diversions. Many diversions do not "store" water, they simply divert streamflow. Isn't "flow regime" a clearer term than "hydroperiod" (also used elsewhere). As in earlier comment, We believe the influence of decreased upper watershed retention is overstated. Is this the same thing as higher density of vegetation in the upper watershed (increasing transpiration?) We don't think so. The ET increase is probably understated in your descriptions.

There is no doubt that releases from dams no not mimic natural flows, but the context for this should be described- it is below the reservoirs (Almanor, Butt, Carribou, etc.) and it is dealt with during FERC relicensing (exception here are Davis, Antelope and Frenchmen which are not FERC projects). That is one problem. The other problem is the multitude of (mostly Agriculture) diversions, which are governed by an entirely different set of regulations, and often leave too little water in stream to sustain trout fisheries.

4.2.4

Issue: *Drought, disease, accumulation of biomass, increased stand densities, have dramatically increased the probability of catastrophic wildfire. Residential and recreational development in high fire hazard areas increases the probability of severe wildfire damages to natural resources, and human life, and property*. Current stand densities in the region are six to eight times higher than estimates of prehistoric densities,and ground and ladder fuels have accumulated due to suppression of natural low-intensity fires. Forests today are choked by small conifer thickets that threaten the survival of mature trees from drought and severe intensity wildfire. Even age tree plantations result in dense forest stands that are especially susceptible to wildfire damage, drought, pests, and disease. Thinning forest ground and ladder fuels through tree removal and through the use of managed fire is required throughout the watershed to conserve forest productivity and drought resiliency, to reduce the risk of forest conversion to grasses and brush from catastrophic wildfires, and to begin restoring historic water infiltration capacity in forest soils and aquifers.

Comment: As in early comments focus is on water infiltration. In our experience, water infiltration following wildfires is only an issue in some soil types, and is relatively (2-5yr) short lived. The influence of high stand densities on transpiration is not addressed, but would seem to be a bigger factor affecting runoff regimes.

Comment: While We essentially agree with the verbiage in this issue, missing here is the key resource objective: fires must be reintroduced into forested ecosystems with some semblance of their historic frequency.

Issue: *Declining rates of groundwater infiltration are changing the hydroperiod of streams in the Plan area*. Reduced snowpack and groundwater retention throughout the watershed has led to an increase in precipitation runoff during high peak flows, followed by reduced stream flows during the summer dry season when vegetation evapotranspiration is highest. As the climate trends towards a change in precipitation from snow to rain and higher summer and winter temperatures, the current trend of reduced water retention may continue to accelerate without active watershed management.

Comment: Some of the description of this issue doesn't make sense. Reduced snowpack has led to increased precipitation runoff? We again question use of "hydroperiod" rather than "flow regime". There is more involved than the length of time something flows. Is there a declining "rate" of groundwater infiltration? Aren't you talking about an amount, versus a rate? There is good information available, such as the PG&E review of changes to runoff in the Almanor Basin. Less snow, warmer temps, less runoff. We think it would be clearer if the emphasis was on runoff, and away from the concept of "retention" for which you have not made a strong case.

Issue: *Reduced groundwater availability and increasing temperatures are causing forests to convert to brush after disturbance*. Reduced precipitation retention times from reduced snowpack storage in the upper elevation parts of the watershed, and from damaged soils in severely burned forests, can lead to rapid loss of precipitation to surface runoff. This occurrence typically results in highly turbid peak flows followed by increasingly reduced stream flows during the summer dry season. Over months and decades, effects of severe fires can vary depending on burn severities, soils, geology, precipitation, and vegetation response. The past decade (2005-2015) has included several years of severe drought. In the region's forestlands, drought stress is killing the biggest trees and threatening vast stands in mature forests. Drought also increases the flammability of dense understory forest thickets, which are "ladder fuels" for crown fires that kill mature trees. Severe multi-year, drought-stressed forest landscapes across the region are at increasing risk for destruction by catastrophic wildfire and pests and diseases. Watershed recovery after severe wildfire is identified as an increasingly important management priority along with reducing forest fuels in order to enhance and sustain watershed functions including stream hydrology and quality. Altered stream hydrology and increasingly severe wildfires threaten the future of mature forests and summer streamflow ecology, intensifying conflicts over forest and water management. Including stream hydrology rehabilitation and groundwater recharge recovery in designing ecological recovery for both unburned and severely burned mature forests and other key forest habitats, such as streams, is the focus of multiple UFR IRWM watershed and forest ecosystem enhancement and recovery projects. Initiating landscape scale and integrated approaches to forest and water conservation should help to reduce management conflicts over impaired stream hydrology as monitoring and evaluations are used to inform adaptive an integrated forest and watershed management.

Comment: Why not just say "infiltration" rather than reduced retention time? Precipiation is not runoff. We think you are trying to talk about surface flow here. We believe that the statement that drought is killing the biggest trees is debatable. The issue is complex, with stand densities, insects, etc. contributing. Most of this paragraph is very unfocused. Fire does change things, most of the changes are

short term. Large wood recruitment to channels being the exception. Fires do produce more water, along with more sediment and nutrients. We suggest re-write of this issue.

Issue: Tree encroachment into meadows.

This is a repeat of issue discussed earlier in 4.2.2

Issue: Increases in forest stand densities lead to increased evapotranspiration and reducedgroundwater infiltration. Historic forest management practices and forest fire suppression have led to a marked increase in stand densities over natural conditions and what is considered optimal for forest health. High stand density increases evapotranspiration, which depletes soil moisture and dense forest canopy cover decreases groundwater infiltration.

Comment: Overly complex discussion. Water enters the soil via infiltration, ET reduces soil moisture, which may in turn reduce groundwater contributions to stream flow.

Unclear how dense forest cover decreases infiltration. ET does not use water that has not infiltrated.

Issue: Insufficient water available for forest and fire management.The increased frequency and extent of catastrophic wildfire also increases the demand for water forfirefighting.

Comment: Is there any documentation that there insufficient water is available for fire fighting? In our experience, fire suppression always finds water. They may have to travel some distance, but We don't believe" insufficient water" is accurate.

4.3 Conflicts in the Region

Environmental water uses involve stream flow levels necessary to maintain aquatic, wetland, and riparian habitats as well as aesthetic values. The Middle Fork of the Feather River between Mohawk Valley and Lake Oroville has been designated a Wild and Scenic River. The headwaters of the Middle Fork are in Sierra Valley, which is the largest agricultural area in the watershed with over 40,000 acres of irrigated farmland and includes the two incorporated cities in the region. Consumptive water uses in Sierra Valley and Mohawk Valley could conflict with flow needs in the downstream Wild and Scenic reach of the Middle Fork if current water demands or conditions change.

Comment: We agree that instream flows are a huge problem for aquatic and riparian species. The above paragraph diminishes the issue by limiting discussion to the Middle Fork. It is an issue in the basin almost everywhere water is diverted.

Other conflicts in the watershed arise from land management practices. The vast majority of the watershed is forested uplands, and past management of those lands has resulted in substantial conflicts including water resource issues. Past mining and logging activities have left a legacy of toxic pollution from tailings and a large number of legacy and poorly maintained roads that are susceptible to erosion. Logging has declined since the late 1980s which has exacerbated the buildup of fuels and increasing forest densities, impairing forest health, all of which can affect the quantity and quality of surface and ground water in a variety of ways. The most important forest management strategies for watershed improvement are stand thinning and road restoration. However, these activities are uneconomic, controversial and frequently opposed. Conflicts over closures of forest roads will continue when roads are developed for emergency firefighting access.

Comment: It is unclear what the conflict is here- most of the discussion sites historic, not current conditions. The discussion seems to assume that road treatment equals road closure. That is not true. Most road related problems can be significantly reduced with road reconstruction. We also question that stand thinning is controversial (reference scores of projects and thousands of acres treated in the watershed). Some may not want commercial harvest of timber on federal lands, if that is the issue, so state. Are roads developed for emergency firefighting access?

5.3.1 Goals and objectives

Comment: No attempt is made to explain the difference between goals and objectives. No definitions are provided to distinguish between them.

In our experience, objectives are achievable and measurable. A typical definition for objective is: "A specific result that a person or system aims to achieve within a time frame and with available resources."

Unfortunately, We can discern no difference between the 5 goals and the 18 objectives. They all appear to be goals. As objectives are measurable (and goals frequently difficult to measure) this leads to subsequent problems in defining metrics and monitoring. Also, because the goals are so general in nature it makes them very hard to use in a strategic planning sense. There is nothing here to guide one in determining "where" or "how many" actions are needed.

5.4 Plan Integration of Goals and Objectives

Comment: It is very unclear what section 5.4 is intended to do.

What do "x"s in the tables mean?

What are the issues supposed to do, relative to this strategic plan? Are they used to set priorities?

There should be some explanation of the purpose and utility and "process" of the tables.

Likewise, there is no explanation of the 5-6 tables either. Why are they presented? How do they contribute to the strategy (how are they used)? How do they work?

Example question: If We look at project ALS-1 (Taylorsville Mill Race Dam Resurfacing) We see an "X" under Objective 2 (Reduce potential for catastrophic wildland fires in the Region). Surely, resurfacing a dam is not going to result in reducing potential for catastrophic wildfires in the region. At the very best, such a project might improve availability of water for nearby fire suppression. That is a different objective. In any case, the table, and the "X's need to be explained.

There is also no explanation of where the implementing projects came from. We did not read the stakeholder section, perhaps it's in there (just checked, did not see a description there). Ideally, there would be clear link between plan objectives and projects, as in, the projects were designed to meet the objectives. We suspect this was not the case, because there really are no plan objectives (they are

goals). So what we have is a list of projects that a group of folks thinks are good projects. That's okay if that's all that can be achieved, but that should be explained.

The connection of the RMS to the plan is also somewhat of a mystery. Were the strategies used to help identify the actions? Pg 6-22 reads "In May, the RWMG assigned the remaining applicable RMSs to workgroups to ensure each applicable RMS was addressed." This is confusing to us. Aren't strategies applied? How were the results shown in table 6-1 used? Were actions based on the recommendations? In this document, strategies seem to be treated as another set of goals, and the approach is very confusing.

Chapter 11: Monitoring

I'll limit my comments to the Plan Performance element of this section. Because the plan objectives are goals, they are not really measurable. What you have listed in Table 11.1 as metrics are not really measures of plan effectiveness, rather they are a "lite" form of implementation monitoring. Take for example the Performance Measure "restore natural hydrologic function". We assume that "Performance Measure" is another term for objective. This in itself is confusing. The Plan has objectives, why aren't the objectives the basis of the monitoring (to see whether or not objectives were attained)? In any case, the metrics for "restoring natural hydrologic function" are: "*Implement 3 Plan projects that restore natural hydrologic functions*; and *Update the project list and technical and scientific studies at the annual RWMG meeting*." There is no way that at the scale of the Feather River Watershed, implementing three projects and updating a list are going to result in restoring hydrologic function. Counting the number of projects is not even really implementation monitoring, it is really just an accounting. One option is to change the objective. It could be for instance "implement three projects that restore hydrologic function at the site scale", and the metric could be number of projects. The other option is to change the metric, but because the objective is not measurable, that would be difficult (We think you would have to change both). Something like: *objective*: reduce estimated time to peak flow in X,Y, Z watersheds by 10%. I've gone too far with this, but the point is that most, if not all the Performance Measures in the table are not addressed by the metrics and the measures should be changed to something that can be measured.

Mangement of Stormwater from impervious surfaces.
Over the years, we've made numerous observations of problems associated with runoff from large impervious surfaces, especially parking lots. Though these represent a very small percentage of the watershed, they tend to concentrate flows, and at least for the first large storms of the year, contribute solids, nutrients and other pollutants to surface water. We were interested to see if the issue was discussed in the IRWMP.

There is a stormwater RMS, and there are work group strategy recommendations, but we could find no action related to stormwater. We did find this classic sentence: "There are currently no SWRPs within the UFR Region. However, should a SWRP be developed within the Region, the RWMG would

incorporate it into the UFR IRWM Plan as an appendix and include the SWRP in the Data Management System."

The other confusing thing is that the stormwater RMS is listed as a Resource Management Strategy in the Climate Change Vulnerability Table (8.1). The very brief intro to the table says those things listed are "relevant resource management". We wonder why this strategy is listed (it implies it is being used to reduce vulnerability) when the strategy is only discussed and not applied in the project area (there is no management). Perhaps this section needs better explanation.

Specific Comment on one project:
We noticed that one project **(Sierra Valley Agricultural Water Diversion Efficiency and Improvement Project) is located outside the project area. We understand that water from the Little Truckee is diverted to Sierra Valley. Nonetheless, the project area description does not mention any exceptions for such a project, and it would appear to be at least partially outside the area covered by the plan.**

Comments prepared by Ken Roby and Mike Kossow (9/13/16)