

THE STONY CREEK WATER WARS
Glenn County - Tehama County - Colusa County , California.
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Collected references to Salmon on Stony Creek

Important because it accumulates references to the fine salmon run on Stony Creek rendered extinct by Reclamation (and GCID)

Early references to salmon on Stony Creek are quite scarce. I assume that the overwhelming abundance on the Sacramento into which it flows overshadowed any interest in Stony Creek salmon except among the local Indians. Among the comments I've found, the only comment I have full faith in is the testimony by State Senator & Superior Court Judge Claude Fouts Purkitt in the Angle Case. The rest of them seem to track back to where they disappear rather than originate in eyewitness anecdote or collected data. The absence of footnotes, etc. in some critical early works is distressing. I'm continuing to dig for sources to make sure that's not a real problem.

BIOLOGIC:

- [State of California, Fish and Game Commission, Twenty-Third Biennial Report, for the Years 1912-1914](#) [click on "pdf"; which contains multiple reports]

p. 59 Following is a list of surveys which have been made for fish ladders to be installed over dams in California up to July 1, 1914:

Owner / County / Stream / Action

U.S. Government / Glenn / Stony Creek / [fish] Ladder under construction

[which dam? what species of fish?]

References in SWRCB Ap. 18115 filings by the California Sportfishing Protection Alliance lead to

- [Clark, G.H. 1929](#), pp. 44-45 of *Sacramento-San Joaquin Salmon (Oncorhynchus tshawytscha) Fishery of California*. Division of Fish and Game of California Fish Bulletin No. 17, 73 pages. (the [full bulletin is here](#), Stony Creek is in Part II) ; discussed at p. 119 Division of Fish and Game/Fish and Game Commission, Thirty-First Biennial Report for the Years 1928-1930 <http://www.archive.org/details/californiafishgabien19281930cali2> , also *California Fish and Game [Journal]* v. 15 #1, p. 1, G.H. Clark, "Sacramento River Salmon Fishery" http://www.archive.org/details/californiafishga15_1929cali [inexact map at p. 9 shows barriers on Stony at NDD & Stony Gorge, article mostly advocacy regarding dams, 6000 miles of spawning streams in the Central Valley cut to 510 miles], and, same issue, p. 13, N.B. Scofield, "The Status of Salmon in California", both articles advocacy rather than scientific reporting.

p. 44: Fig. 23. Showing the crossing of the Glenn-Colusa Ditch over Stony Creek [crude map]

Stony Creek, in Tehama County: This is also a branch on the west side which joins the Sacramento River near the town of Hamilton [p. -- 45 --] Formerly there was a spring and fall run in this stream, but now there is neither, as the stream is dry except during the rainy season.

There are two dams on this stream. The Orland Project Dam, owned by the U.S. Reclamation Service and located 4 miles west of Stonyford, is 20 feet high and was built about 1914. The water is used for irrigation around Orland. Another dam on Big Stony Creek is 90 feet high, which is too high for a fish ladder.

The Glenn-Colusa Irrigation District pumps water from the Sacramento River above Hamilton. There are no screens on the pumps and small fish are pumped into the large canal, which crosses Stony Creek below Hamilton. The company has thrown up a temporary dam with a solid base across Stony Creek so that the irrigation water can cross the stream. (See Fig. 23) There are gates on each side of Stony Creek where the canal crosses to control the creek water in flood time. Dredges are kept there to keep the canal clear, across Stony Creek, during the summer and fall. The dam usually is washed out in high water. Any water that may run in Stony Creek during the irrigation season is diverted into the Glenn-Colusa Canal. Salmon have no chance of getting up this stream now, even if there were any water.

From reports, Stony Creek, before irrigation dams were put in, was a very good salmon stream, but now no salmon can go up the creek as there is no water, as explained above."

[No specific references or footnotes; requests to CDFG regarding those "From reports" not yet fruitful.]

- In SWRCB Andreotti Ap. #24758 files, Folder 2, Item 3, Exhibit 1 - 02/1964 *A Reconnaissance Study to - Investigate the Feasibility of the Upper Stony Creek Watershed Project (Glenn and Colusa Counties, California) for Construction under the Federal Watershed Protection and Flood Prevention Act, Public Law 566*, a Report for the State Soil Conservation Commission, Sacramento, California by Division of Soil

Conservation, Department of Conservation, State of California; identifies site for Pleasant Valley Dam & Reservoir on North Fork of [Big] Stony Creek for irrigation of Stonyford area - mentioned but not discussed, flows would improve fisheries downstream as far as the Sacramento River

Pleasant Valley damsite just below Goulding Creek, drains 23.5 sq. mi, estimated average annual flow 16,500 a-f, 105 foot earthfill structure of 260,000 yards; at spillway elevation gross volume of 2700 a-f, 90-acre surface; natural flows at Rainbow sufficient one season in three for predicted irrigation plus 17.5 cfs fishery demand [paraphrased]

- In SWRCB Application A026378 File, City of Santa Clara Stony Gorge Power Plant File Category 7 FERC LICENSES AND REPORTS VOL. 1 OF 1 Folder 2, Item ?
- 102081 Before the Federal Energy Regulatory Commission, Application for License for Project No. 3193, The Stony Gorge Hydroelectric Project By the City of Santa Clara, California, Prepared by: Resource Management International, Inc. Sacramento, California and Sverdrup & Parcel and Associates, Inc., San Francisco, California; on cover, SCH "81011202" - - [AND] - - File Category 20 TRANSCRIPTS AND EXHIBITS VOL. 1 OF 1 Folder 4, Item 3, Exh. 11 - Exh. 11 Application 26379 - Before the Federal Energy Regulatory Commission Application for License for Project No. 3190 - the Black Butte Hydroelectric Project by the City of Santa Clara, California Prepared by: Resource Management International, Inc. Sacramento, California and Sverdrup & Parcel and Associates, Inc., San Francisco, California 09/1981

[from] Table E-6
Fish Species of the Stony Creek Drainage

Anadromous Fishes

King (chinook) Salmon	<i>Oncorhynchus tshawytscha</i>
Steelhead Rainbow Trout	<i>Salmo gairdneri</i> [not "t. mykiss?"]

Resident Fishes

Silver (Coho) Salmon	<i>Oncorhynchus kisutch</i>
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p. E-18

"In the past there was occasionally a small run of king salmon in Stony Creek below the Black Butte Dam in years when early heavy rains breached the Glenn-Colusa Irrigation District diversion dam (Puckett, 1969). However, there are no recent reports of any significant spawning usage of the streambed below Black Butte Dam."

p. E-42

"The California Department of Fish and Game has identified the potential for restoration and enhancement of that portion of Stony Creek below Black Butte Dam to establish anadromous fish spawning grounds.

Although there is no good record of the extent of king salmon spawning runs in Stony Creek in its natural state, it is believed that hundreds of salmon may have utilized the stream (Puckett, 1969). With the construction of East Park Dam in 1910 and Stony Gorge Dam in 1928 and the downstream water diversions for the Orland Project and the Glenn-Colusa Irrigation District, anadromous fishery values in Stony Creek were essentially lost. In particular, the diversion dam of the Glenn-Colusa Irrigation District just three miles above the mouth of Stony Creek completely cuts off flow into the Sacramento River from April until heavy winter storm runoff breaches this barrier, usually in December. This prevents most fall-run king salmon from ascending Stony Creek, since the main run is usually over by the time the dam is washed out.

At present, Stony Creek is of little, if any, value as salmon spawning habitat. The completion of Black Butte Dam in 1964 means that even the few salmon that may occasionally enter Stony Creek would be restricted to spawning gravels below the dam. An additional problem is created by the unscreened diversions for the Orland Project and the Colusa-Glenn [sic] Canal, which result in the loss of young salmon on their downstream migration.

[p. E-43] The potential for enhancement of Stony Creek as salmon spawning and nursery habitat was discussed in a California Department of Fish and Game report (Puckett, 1969). Analysis of streambed gravels indicated that only the two miles of Stony Creek immediately below Black Butte Dam contained acceptable spawning material. The remainder of Stony Creek would be unusable because of excessive fine materials and gravel compaction. Habitat enhancement would require large instream flows because the stream channel is quite wide below Black Butte Dam and its bed is highly permeable. Releases of at least 200 cfs would be needed for adequate transport of upstream migrating salmon. No usable spawning areas would be available at flows below 400 cfs. The highest measured streamflow during the study was 755 cfs; it covered only 33 percent of the available spawning area. Streamflows above this level would provide increased spawning material. However, it was concluded that summer

water temperatures would be too warm for salmonid nursery habitat even with bottom releases from Black Butte Lake. Other potentially limiting factors were felt to be turbidity and encroachment of riparian vegetation.

Thus, it appears that the potential for anadromous fishery enhancement in Stony Creek is severely limited. Even if the problem of access for fall-run salmon across the Glenn-Colusa diversion dam could be solved, there is not a great deal of suitable spawning gravel. The releases necessary to make even this small amount of habitat available for reproduction are simply too large to be physically maintained, given the storage capacity of Black Butte Lake. Finally, high summer water temperatures and other adverse factors would make this stretch of Stony Creek unsuitable for nursery habitat."

- Reynolds FL, Mills TJ, Benthin R, Low A. 1993. *Restoring Central Valley streams; a plan for action*. Sacramento (CA): California Department of Fish and Game. 129 p. <http://www.dfg.ca.gov/fish/documents/Resources/RestoringCentralVallyStreams.pdf>

p. 20 [Executive Summary]

Table 4, Evaluation Action to Determine Habitat Needs for Anadromous Fish

Priority C-2 Investigate the reasibility of obtaining adequate stream flows for salmon in Stony Creek - No [cost] Estimate

p. 21

Priority C-2 Investigate the feasibility of constucting a siphon at the Glenn-Colusa Irrigation District canal crossing on Stony Creek, No [cost] Estimate

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p. VII-70

STONY CREEK

Stony Creek is a westside stream originating in the Coast Range and draining into the Sacramento River south of Hamilton City (Figure VII-5). There are three storage reservoirs in the watershed. The lowermost dam, Black Butte, is a barrier to anadromous fish. The Glenn-Colusa Irrigation District canal crosses Stony Creek downstream of Black Butte Dam and consists of a seasonable gravel dam constructed across the creek on the downstream side of the canal. This crossing not only allows the canal to continue flowing south but it also allows capture of Stony Creek water and is a complete barrier to salmon migration.

Stony Creek supports fall-run chinook salmon in years when flow reaches the Sacramento River and adult fish are able to migrate into the creek to spawn. Excellent spawning gravel is present between Black Butte Dam and the Sacramento River.

Stony Creek was identified as a chinook salmon enhancement site by the USBR when planning for the RBDD. The objective of the USBR was to release supplemental water into Stony Creek from the Tehama-Colusa Canal (TCC) to provide additional spawning and rearing habitat for fall-run chinook salmon. The project was never completed and is now the subject of a USFWS Supplemental Coordination Act report. The USFWS is attempting to identify how much mitigation and enhancement was completed and how much is still owed by the USBR.

The USBR recently completed a project using the TCC turnout structure to capture Stony Creek water and deliver it to USBR contractors. This project is opposite in design to the original intent of the structure since it removes water from Stony Creek and diverts it into the TCC. The project is intended to help replace water previously delivered when RBDD gates were in place year-round.

Restoration of fall-run chinook salmon in Stony Creek is dependent on obtaining suitable stream flow below Black Butte Reservoir and adequate fish passage at the GCID and TCC creek crossings. The feasibility of obtaining water and providing passage should be evaluated.

[p. VII-71]

Priority Ranking and Cost of Implementation

Recommendations for evaluation of anadromous fish habitat in Stony Creek:

Priority / Evaluation Action to Determine Habitat Needs for Anadromous Fish / Cost

Priority C-2 / Investigate the reasibility of obtaining adequate stream flows for salmon in Stony Creek / No [cost] Estimate

Priority C-2 / Investigate the feasibility of constucting a siphon at the Glenn-Colusa Irrigation District canal crossing on Stony Creek / No [cost] Estimate

- *Tributary Rearing by Sacramento River Salmon and Steelhead*, interim report 10/30/1994 Paul E. Maslin and William R. McKinney, Dept. of Biol, CSU; measuring & releasing juvenile salmon on many creeks including Stony; comment on how chinook juveniles take refuge in Stony

Creek, etc. 06/29/1995 Baiocchi Protest for CSPA re Reclamation petition for permanent point of diversion: GCID dam erected 02/1994 stranded 5,000 - 10,000 juvenile salmon [CHECK] (Maslin & McKinney 1994) ; [copy in SWRCB Ap. 18115 Correspondence File Vol. 7](#); linked below is the 1995 version which includes also Stony Creek, unlike the 1996 version. [How many versions are there?]

[Introduction](#)

[Methods](#)

[Results](#), including links to Tables and Figures

[Discussion](#)

[References](#)

[THERE ARE MULTIPLE MASLIN reports, it's hard to know which is being cited at any given point; still looking for the rest of them, including the Salmon Rescue on Stony Creek report]

- US Fish and Wildlife Service. 1995. *Working Paper on restoration needs: habitat restoration actions to double natural production of anadromous fish in the Central Valley of California*. Volumes 1, 2, and 3. 9 May 1995. Prepared for the US Fish and Wildlife Service under the direction of the Anadromous Fish Restoration Program Core Group. Stockton, Calif. referenced in 06/29/1995 Baiocchi Protest for CSPA in SWRCB Ap. 18115

[Part 1](#) Stony Creek at 1-IV-12

[Part 2](#) Stony Creek at 2-V-5

[Part 3](#) Stony Creek at 31-Xb- 58 thru 70; in this Part 3, for instance, are

- Action 6 on p.3-Xb-66 for instance discusses creating a distinct channel below Black Butte.
- Action 8 on p.3-Xb-67 discusses halting TCC diversions
- Action 9 on p.3-Xb-68 discusses fish passage at NDD

- [Historical and Present Distribution of Chinook Salmon in the Central Valley Drainage of California](#), [UCDavis web site], Ronald M. Yoshiyama, Eric R. Gerstung, Frank W. Fisher, and Peter B. Moyle, pp. 71 - 176 , 1996

[Contributions to the Biology of Central Valley Salmonids]

also at: [Ceres](#), [CalWater](#); Full bulletin at: [CDFG](#)

[Central Valley Steelhead, Dennis R. McEwan] CDFG Bulletin 179, p. 17 Figure 6 showing Impassable Dams, including Black Butte on Stony Creek

[Yoshiyama, et al.,] Bulletin 179, p. 79 Table 1 Historical upstream limits of chinook salmon in the California Central Valley drainage [fn a] (Continued)

Stream - Upstream distributional limit [fn b]

Stony Creek - Juncture of Little Stony Creek, five miles below Stonyford [this may not have been the limit before the Stonyford/Indian Valley irrigators started diversions before 1870]

p. 151 Stony Creek (Tehama County). Stony Creek is a west side tributary in the Sacramento drainage and formerly supported spring run and fall runs (Clark 1929). Stony Creek was said to have been "a very good salmon stream" before the placement of the irrigations dams (Clark 1929, p 45). Kroeber (1932, p 295), drawing from ethnographic data, stated that "Salmon, for instance, ran up Stony creek through Wintun as far as Salt Pomo territory." The downstream (eastern) bor-

[p.] 152 Fish Bulletin 179: Volume One

der of the Salt Pomo (Northeastern Pomo) tribe has been placed at the confluence of Stony Creek and Little Stony Creek, about five miles below Stonyford (Kroeber 1925, p 224, McLendon and Oswalt 1978), so that point would have been the minimal upstream range of salmon. By 1928, both spring and fall runs were nonexistent due to irrigation diversions that kept the stream dry except during the rainy season (Clark 1929). At that time, there were two permanent dams on the creek: the Orland Project Dam (20 ft high, built about 1914) four miles west of Stonyford, and a dam on Big Stony Creek (90 ft high, "too high for a fish ladder") (Clark 1929) [actually, not Big Stony, just Stony]. There was also a dam across Stony Creek where an irrigation canal built by the Glenn Colusa Irrigation District (GCID) crossed the creek about three miles upstream of its mouth. This dam was usually washed out in high water, but most of the time it would have been a barrier to salmon, had there been any water in the creek (Clark 1929). Presently there are three storage reservoirs on the creek (Reynolds and others 1993). There is "excellent" spawning gravel within the about 20 miles of stream [sic, syntax] between the creek mouth and the lowermost dam, Black Butte Dam, which would be a barrier to salmon (Reynolds and others 1993). However, the GCID canal, which crosses Stony Creek downstream of Black Butte Dam, completely bars salmon migration any farther upstream (Reynolds and others 1993; USFWS 1995). This cross-stream barrier is now seldom washed out except when flood control releases are made from Black Butte Reservoir.

Miscellaneous Small Sacramento Valley Tributaries. In addition to Antelope, Cottonwood, and Stony creeks, more than a dozen other small tributaries in the northern Sacramento Valley occasionally supported fall-run salmon spawning stocks during the period 1940-1959 in years of early and heavy rains, and a few of those streams also had spring runs (Fry 1961)....

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p. 157 Table 2 Estimated changes in lengths of stream available to chinook salmon in the major salmon-supporting watersheds of the California Central Valley [fn a] (Continued)

Watershed /

Length (mi) of stream historically available [fn b] /

Length (mi) of stream presently accessible [fn c] /

Length (mi) of stream lost (or gained) [fn d] /

Percent lost (or gained)

Westside Streams

Stony Creek / 54 / 3 / 51 / 94

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Clark GH. 1929. Sacramento-San Joaquin salmon (*Oncorhynchus tshawytscha*) fishery of California Division of Fish and Game. Fish Bulletin 17. p 1-73.

Fry DH, Jr. 1961. King salmon spawning stocks of the California Central Valley, 1940 - 1959. California Fish and Game 47(1):55-71. [no Stony Creek mention] On reports list and available at: <http://www.dfg.ca.gov/fish/Resources/Reports/index.asp> (as <https://nrmsecure.dfg.ca.gov/FileHandler.ashx?DocumentID=3435>)

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[THERE ARE MULTIPLE Yoshiyama, et al., report iterations, it's hard to know which is being cited at any given point]

- Lower Stony Creek Fish, Wildlife and Water Use Management Plan November 13, 1998 (scanned by Capitol Digital Document Solutions, Sacramento - broken up into 6 consecutive segments for ease of downloading); pagination is a bit tricky, pp. i - xvi, Sections 1-6, Appendices A-I, then Appendix to Chapter 2 A-2, and to Chapter 3, A-3

[one](#), - from p. i to p. 2-4,

[two](#), - from map before p. 3-1 to p. 5-2,

[three](#), from p. 5-3 to A-2-14

[four](#), - from 3 maps before p. A-2-18 to graph & 2 maps after p. A-2-26

- Salmon, p. F-2

[five](#), - from map before A-2-31 to 3 graphs after A-2-73

- Salmon, pp. A-2-49 - A-2-80 (among other places)

[six](#), - from 3 graphs before A-2-80 to end.

- Salmon, pp. A-2-80 - A-2-92

[Bibliography & References](#) recast in html

[insert Chinook/Steelhead quotes....]

- Included report: Appendix I [eye], Preliminary Assessment of Streambed Substrate for Salmon Spawning in Stony Creek, California, 02/1998, Natural Resource Scientists, Inc., Red Bluff [is this Vogel, 02/1998?]

[mentioned in text, but not in bibliography or references :]

- p. F-5: "The Middle Little Stony Creek Watershed Analysis Report," Mendocino National Forest staff, Willows, in progress for late 1998

- p. F-5: "Watershed Plan and Environmental Assessment, Upper Stony Creek Watershed", Natural Resource Conservation Service (SCS), Davis, CA 07/1989

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- Maslin, P.E. and W.R. McKinney. 1994. Tributary Rearing by Sacramento River Salmon and Steelhead Interim Report. CSU Chico. October 30.
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Exhibit I [eye]

Preliminary Assessment of Riverbed Substrate for Salmon Spawning in Stony Creek, California

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- Southwest Regional Office, National marine Fisheries Service, [Central Valley Chinook Salmon Current Stream Habitat Distribution Table](#) (most current reference therein, 1999)
Sacramento Valley (north to south)

Stream or Tributary (RM=river mile)

- Stony Creek (RM 189)

Run / Upper Limit of Run (RM=river mile) / Sources - References - Pers. comm. / Comments / Survey Dates

- fall / Black Butte Dam (~24 mi. upstream) and/or the Glenn Colusa Irrigation District Dam (GCID) / CDFG 1998a, Kano 1998, USFWS 1998, USBuRec 1996, Yoshiyama et al. 1996 / Black Butte Dam (CVP, constructed 1963) is present upstream limit. 1989 (11/30) surveys from the I-5 bridge downstream 10.4 miles and aerial surveys (12/4) of 19.4 miles observed the stream was dry from the GCID to the mouth, 2 redds were counted. / 1957 1968 1981 1989 1994
- late fall / same as above / USBuRec 1996 / See Lower Stony Creek Fish, Wildlife and Water Use Management Plan on website [where, other than my site?] / 1994
- fall & spring / Up Hwy 32 to Capay Rd. or 6th Ave. / Maslin, Maslin 1996a / Non-natal rearing study. Majority of fish are fall run. / 1997
- winter / Up Hwy 32 to Capay Rd. or 6th Ave. / Maslin, Maslin 1996a / 1997

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- A more thorough summary is in the National Marine Fisheries Service Biological Opinions & drafts, 2002, 2007 & 2008,
 - [NMFS 03/11/2002, NMFS Biological Opinion on Lower Stony](#), collecting the Chinook history of the stream
 - Cover letter, McInnis/NMFS to Ryan/Reclamation & Walsh/USACE. 03/22/3003
 - Enclosure 1, "Biological Opinion", 03/11/2002

[Chinook & Steelhead discussions too extensive to recite here, see the report]

[Incidental Take Permit:]

[p. 50:] "This analysis indicates that an annual total of; 20 Sacramento River winter-run chinook salmon; 80 Central Valley Spring-run chinook salmon; and 160 Central Valley steelhead trout are likely to be captured through the combination of entrainment monitoring at the irrigation diversions and the other sampling associated with the fisheries monitoring study....The estimate for actual mortality of captured fish is 5% or less of those captured."

[Is this a 100% take permit?]

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- [Somewhere around 2002] [Stony Creek Watershed Program](#). [Proposal], Glenn County Public Works, CALFED Bay-Delta Program Project Information, Watershed Program - Full Proposal Cover Sheet; [orphan link, unsure of what it pertains to];

p. 9, "Task 4: Restoration Plan/Education Coordination

The restoration plan for this project is a complex task. Due to the effects on the stream caused by the Black Butte Dam, restoration will take a significant effort."

pp. 14 - 15 [as part of the updated monitoring program],

- fish survey (resident and anadromous)

"DWR currently has a multi-year water quality monitoring and fish monitoring program in place on Lower Stony Creek, in cooperation with USBR. It is anticipated that parameters (from the list above [including the fish survey]) that [page break] are currently not part of that program will be added. There is funding set-aside in the budget to compensate DWR analyzing the data that they have collected...."

Some references on pp. 15-16:

- 1) [11/13/1998], *Lower Stony Creek Fish Wildlife and Water Use Management Plan*, U.S. Bureau of Reclamation [linked above]
 - 2) [date?] *Lower Stony Creek Watershed Strategy and Stewardship Plan*, Glenn County Public Works and Development Services
 - 3) 1989, *Upper Stony Creek Watershed Plan and Environmental Assessment*, Soil Conservation Service, U.S. Department of Agriculture
 - 4) 1995, *Grindstone Creek Watershed Strategy*, Department of Forestry and Department of Interior
 - 5) 1997, *Briscoe Creek Watershed Analysis Report*, Forest Service, Pacific Southwest Region, Mendocino National Forest
 - 6) 1993, *Glenn County General Plan*
 - 5) [date?], *Colusa Basin Drainage District Plan*
- [Stony Creek Watershed Assessment, Volume 1](#). Lower Stony Creek Watershed Analysis. Prepared for Glenn County Resource Conservation District., H.T. Harvey & Associates. 2007b. p. 67, Fisheries Assessment; p. 92 Fisheries; more salmon at pp. 71,73,74,77,80,86,88,94,97,98,A-13; Literature Cited, pp. 94-99

[Chinook & Steelhead discussions too extensive to recite here, see the report]

p. A-13, Jerry and Gloria Lely - His father harvested salmon with pitchfork in some years during the depression

- [Stony Creek Watershed Assessment, Volume 2](#). Existing Conditions Report. Prepared for Glenn County Resource Conservation District. H.T. Harvey & Associates. 2007a.; Fish Assemblages in Lower Stony Creek, pp. 50-51; salmon, pp. 9,37,41, 50,51,52,53,54,53,54,55,56,59, 60,65,66,67,68, A-2,Figure 21,C-2; M-20,M-21,M-22,M-24,M-26; M-2 - M-5 Special Status Fish Species (M-2 Life History Characteristics of Stony Creek Salmonids); References pp. 63 - 68, D-5 - D-6, D-8 - D-9, D-11 - D-13, D-16 - D-18, D-21 - D-22, D-25, D-28 - D30, D-32 - D-33, D-35, D-38, D-41, D-43, D-46 - D-47, D-49 - D50, D-53, D-55, D-57 - D-58, D-60, D-62 - D-63, D-65 - D-66, D-68 - D-69, D-71 - D-73, M-19 - M-26

[Chinook & Steelhead discussions too extensive to recite here, see the report]

For instance, p. 50:

Data on the relative abundance of fishes in lower Stony Creek comes from trapping and netting by the U. S. Bureau of Reclamation from 2001-2004 (Corwin and Grant 2004 [Richard Corwin, Principal Investigator](#) web page.). Table 3-5 lists the percent of total catch for all species found. From a total catch of 64,962 fish, two were juvenile steelhead trout and 869 were juvenile chinook

salmon. The run composition of the juvenile chinook salmon, as determined by the daily fork length criteria (Greene 1992) was 85% fall-run, 8% spring-run, 5% late fall-run, and 2% winter-run.

- [NMFS 01/29/2007 Draft BiOp](#)

[Chinook & Steelhead discussions too extensive to recite here, see the report]

[incidental take permit not specifically quantified, added in final]

- [NMFS 06/20/2008 Final BiOp](#)

- Cover letter, McInnis/NOAA to Person/Reclamation & Chapman/USACE. 06/20/2008
- Enclosure 1, Biological Opinion, 06/20/2008

[Chinook & Steelhead discussions too extensive to recite here, see the report]

Incidental Take Permit:

[p. 59] "Take may

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[p. 60] not exceed 328 Chinook salmon and 20 steelhead. Lethal take for salmonids may not exceed 49 individuals during the annual monitoring/salvage operations."

[This take quantity was more than the winter-run counts passing RBDD at its lowest level, and is more than counts on some of the remaining active Central Valley spawning streams, see 2002 BiOp p. 19 (the 2002 opinion has a different focus from the 2008 so they complement each other). Allowable take of Chinook tripled and lethal take jumped 6-fold from the 2002 permit? Is this a 100% take permit, increased to match the population? There should not be any take allowed at the T-C Canal/CHO berm: the permitted purpose of the CHO to begin with was to help the fish, not kill them. Where did we go wrong? Who's minding the store?]

VII. [some of the] LITERATURE CITED California Department of Fish and Game. 1993. Restoring Central Valley streams: a plan for action. Reynolds, F.L., T.J. Mills, R. Benthin, and A. Low. Sacramento. 129 pp.

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Yoshiyama, R.M., F.W. Fisher, and P.B. Moyle. 1998. Historical abundance and decline of Chinook salmon in the Central Valley region of California. North American Journal of Fisheries Management 18:487-521.

- Enclosure 2, Magnuson-Stevens Fishery Conservation and Management Act (MSA), Essential Fish Habitat Conservation Recommendations, U.S. Bureau of Reclamation and U.S. Army Corps of Engineers Lower Stony Creek Water Mangement Operations

Literature Cited: [excerpt here]

- [GCRCD \(Glenn County Resource Conservation District\). 2009. Lower Stony Creek Restoration Plan.](#) January 12, 2009. Also available online at: (Accessed April 30, 2009); Back and forth argument among the lower watershed stakeholders as to whether or not to include salmon.

One comment: p. 48, "(My) father used a pitch fork to catch salmon years ago when times were tough." presumably, on Stony Creek

- [NMFS Public Draft Central Valley Recovery Plan and Related Documents, October 2009](#)

1. [Central Valley Recovery Plan](#)

- Stony, pp. 98,104,123,130 [multiples per page]

- Stony, maps, p. 20,27,33,39,46,54,55, 101,125

- References [extensive; here are those with the word Stony] :

- - Glenn County Resource Conservation District. 2009. Lower Stony Creek Restoration Plan. January 12, 2009. Also available online at: http://www.glenncountyrzd.org/nodes/educationoutreach/documents/DWR_Report_30_draftPlan.pdf Accessed April 30, 2009

- - H.T. Harvey & Associates. 2007b. Stony Creek Watershed Assessment, Volume 1. Lower Stony Creek Watershed Analysis. Prepared for Glenn County Resource Conservation District. Available online at:

<http://www.glenncountyrzd.org/nodes/educationoutreach/LowerStonyCreekWatershed.htm> (Accessed April 30, 2009)

- - H.T. Harvey & Associates. 2007a. Stony Creek Watershed Assessment, Volume 2. Existing Conditions Report. Prepared for Glenn County Resource Conservation District. Available online at:

<http://www.glenncountyrzd.org/nodes/educationoutreach/LowerStonyCreekWatershed.htm> (Accessed April 30, 2009)

- - Swanson, M.L. and G.M. Kondolf. 1991. Geomorphic Study of Bed Degradation in Stony Creek, Glenn County, California. Prepared for California Department of Transportation, Division of Structures, 15 May 1991.

- - U.S. Department of Interior, Bureau of Reclamation (USBR). 1998. Lower Stony Creek Fish, Wildlife and Water Use Management Plan. U.S. Bureau of Reclamation, Northern California Area Office, Mid-Pacific Region.

2. List of Appendices

1. [Appendix A - Central Valley Watershed Profiles](#)

- Stony, pp. 2, 169 thru 174

Stony Creek Watershed Profile

Listed Species Present in the Watershed

Central Valley spring-run Chinook salmon
Central Valley steelhead

Species that Historically Occurred

Central Valley spring-run Chinook salmon

Exhibit F 04/06/2010

Central Valley steelhead

Diversity Group

Northwestern California

Watershed Restoration and Potential to Support a Viable Population

Watershed/Ecosystem Restoration

Existing conditions in Stony Creek preclude the annual production of spring-run Chinook salmon and steelhead (H.T. Harvey and Associates 2007a). Excessively low flows and warm water temperatures in Stony Creek during all life stages prevents the successful production of spring-run Chinook salmon and steelhead (H.T. Harvey and Associates 2007a). Any efforts to improve habitat conditions for anadromous salmonids in Stony Creek should consider the potential effects of climate change, which may prohibit successful production of coldwater fish in this low elevation watershed.

[p. 169]

Viability potential

CV spring-run Chinook salmon - Low
CV steelhead - Low

Stony Creek is characterized as having a low potential to support viable populations of spring-run Chinook salmon and steelhead. This characterization is based on the following factors: (1) the system does not currently support populations of spring-run Chinook salmon and steelhead; (2) water diversions limit instream flows; (3) the watershed is at a relatively low elevation (Lindley et al. 2004), and thus, instream flow inputs are in the form of rainfall, not snowmelt; and (4) water temperatures under the current climate may already be beyond the thermal requirements of coldwater species such as spring-run Chinook salmon and steelhead, and climate change is expected to increase water temperatures in the Central Valley (Lindley et al. 2007).

Key Threats and Stressors

Key threats and stressors to Central Valley steelhead in Stony Creek include, but are not limited to the following:

- Passage impediments/barriers by Black Butte and North Diversion dams affecting immigrating adults
- Water temperature and/or water quality changes in Stony Creek affecting adult immigration and holding, juvenile rearing and outmigration, and embryo incubation

Key Actions

- Additional threats and stressors are displayed in Appendix A of the Recovery Plan
- Provide anadromous fish passage above Black Butte Dam. (We aren't considering it in the footprint)
- Enhance watershed resiliency in Stony Creek by identifying and implementing projects that would reduce the potential for, and magnitude of a catastrophic wildfire, restore meadows to potentially increase summer flows and reduce local water temperatures, or increase riparian shade.
- Evaluate water releases from Black Butte Dam, water exchanges with the Tehama-Colusa Canal and interim and long term water diversion solutions at RBDD

[p. 170]

- Install water temperature recorders at select locations in Stony Creek; develop recommendations for minimum instream flow based on temperature needs

Watershed Description

Originating in the Coast Ranges (USFWS 1995), Stony Creek is the second-largest westside tributary to the Sacramento River and drains approximately 740 square miles along California's Coastal Range in Tehama, Glenn, Colusa, and Lake Counties. The Stony Creek watershed has three reservoirs (Black Butte, Stony Gorge, and East

Park), which have a combined storage capacity of more than 260 thousand-acre-feet (taf) (GCRC 2009). Typically, the watershed is discussed as two separate sections, the Upper Stony Creek Watershed and the Lower Stony Creek Watershed, with Black Butte Dam and its associated ridgeline forming the boundary (H.T. Harvey and Associates 2007a). The upper watershed encompasses approximately 473,915 acres including the Grindstone Creek, Briscoe Creek, Upper and Middle Stony Creek watersheds, while the lower watershed is approximately 24,497 acres in size (H.T. Harvey and Associates 2007a).

Geology

Upper Stony Creek

The Upper Stony Creek Watershed overlies mechanically weak volcanic, metamorphic and metasedimentary rocks of the Franciscan Complex (Swanson and Kondolf 1991 as cited in H.T. Harvey and Associates 2007a). The west side of the north-south trending linear valley marks the contact between the Franciscan Complex and younger sedimentary marine sandstones and conglomerates of the Great Valley Sequence, tertiary volcanic rocks, and alluvial deposits of Pleistocene and Holocene age (H.T. Harvey and Associates 2007a). The older non-marine alluvial deposits consist of consolidated inter-bedded gravel, sandstones, and siltstones (H.T. Harvey and Associates 2007a).

Lower Stony Creek

The majority of the Lower Stony Creek Watershed is comprised of alluvial fan deposits of the Pleistocene and Holocene epochs (H.T. Harvey and Associates 2007a). Releases from Black Butte Dam enter lower Stony Creek near the apex of the Stony Creek alluvial fan, and lower Stony Creek flows entirely through these Pleistocene and Holocene Stony Creek alluvial fan deposits, until near Mills Orchard, where the fan deposits become interbedded with finer-grained Sacramento River floodplain deposits (H.T. Harvey and Associates 2007a).

[p. 171]

The alluvial fan surface's broad, concave-upward topography typically drains rainfall-derived runoff away from, not into the lower Stony Creek channel. The alluvial fan surface does not contribute flow to the channel so it is not technically within the watershed (H.T. Harvey and Associates 2007a). The Lower Stony Creek Watershed area is therefore a narrow band, which includes the currently active channel area and formerly active channel and floodplain terraces inset within the broader inactive fan deposits (H.T. Harvey and Associates 2007a).

Hydrology

Upper Stony Creek Watershed

Streamflows in the Upper Stony Creek Watershed are regulated by East Park and Stony Gorge reservoirs before flowing into Black Butte Lake. The main tributary streams drain eastward from their headwaters into a broad north-south trending valley through which Stony Creek flows northerly for about 30 miles to its confluence with Grindstone Creek, then flows northeasterly for about 10 miles to Black Butte Lake (Swanson and Kondolf 1991 as cited in H.T. Harvey and Associates 2007a).

East Park and Stony Gorge reservoirs impound water for irrigation and have no flood control capacity. These reservoirs likely attenuate flood peaks from the upper watershed to some degree, but their primary effect on the hydrology of the system is increasing summer base flows downstream. These reservoirs do not significantly reduce the sediment yield from the upper basin because they do not intercept sediment from tributaries with the greatest sediment yield, notably Grindstone Creek (H.T. Harvey and Associates 2007a).

Lower Stony Creek Watershed

Flows from Lower Stony Creek Watershed are controlled by releases made from Black Butte Lake for flood control and irrigation, and irrigation diversions. Black Butte Lake is operated from April to October for irrigation by the U.S. Bureau of Reclamation, while the U.S. Army Corps of Engineers (USACE) operates the reservoir from November to March for flood control purposes (H.T. Harvey and Associates 2007a).

Since the construction of Black Butte Dam in 1963 the frequency and extent of flooding along lower Stony Creek has been significantly reduced (H.T. Harvey and Associates 2007a). However, there are now higher and more variable summer and early fall flows, attributed to irrigation releases. Flows are often sustained through late fall. In 2007,

[p. 172]

H.T. Harvey and Associates (2007b) conducted a detailed analysis of hydrologic changes due to Black Butte Dam. Their analysis showed that the dam reduced the duration of flows larger than 15,000 cfs by an average of about 1 day per year since 1963, while the duration of flows between 14,000 and 15,000 cfs has increased by an average of 0.62 days per year (H.T. Harvey and Associates 2007b).

Land Use

Upper Stony Creek Watershed

The majority of the Upper Stony Creek Watershed is publicly owned (i.e., Mendocino National Forest) (H.T. Harvey and Associates 2007a). The landscape of the Upper Stony Creek Watershed reflects the inhabitation and management of several cultures and eras, including Native American residence and Euro-American settlement (USDA 1995 as cited in H.T. Harvey and Associates 2007a). Mining, timber harvesting, agriculture and grazing, water management, and recreational land use practices can be observed in the Upper Stony Creek Watershed.

Lower Stony Creek Watershed

Compared to the Upper Stony Creek Watershed, the Lower Stony Creek Watershed is smaller in area. By contrast, approximately 96% of the land within the lower watershed is privately owned. Land uses include agriculture, grazing, gravel mining and rural residences (USBR 1998 as cited in H.T. Harvey and Associates 2007a). Some public land, associated with diversion canals and other types of infrastructure also exists within the lower watershed (H.T. Harvey and Associates 2007a).

Fisheries and Aquatic Habitat

The upper limit of anadromous fish access in Stony Creek is Black Butte Dam. The existing opportunistic use by salmonids of Stony Creek is currently limited both spatially and temporally, due to unsuitable water temperatures and flows. Only fall-run Chinook salmon have life history requirements nearly compatible with the existing conditions of lower Stony Creek. Improvements to water temperature and flows sufficient to support annual production of fall-run Chinook salmon also would enhance periodic rearing of non-natal Chinook salmon and steelhead trout (H.T. Harvey and Associates 2007a).

Stony Creek does not currently support a sustained annual cycle of anadromous salmonid production. When connected with the Sacramento River, Lower Stony Creek

[p. 173]

provides non-natal rearing habitat for steelhead and all four runs of Chinook salmon (H.T. Harvey and Associates 2007a).

Steelhead

Data on the relative abundance of fishes in lower Stony Creek comes from trapping and netting by the U. S. Bureau of Reclamation from 2001-2004 (Corwin and Grant 2004). From a total catch of 64,962 fish, two were juvenile steelhead (H.T. Harvey and Associates 2007a). As reported by H.T. Harvey and Associates (2007a), 53 stranded juvenile steelhead were rescued from Lower Stony Creek in March 1997.

While natal rearing by salmonids in Stony Creek occurs during some years, many juvenile steelhead (and Chinook salmon) from Lower Stony Creek are believed to primarily represent non-natal rearing by juveniles spawned elsewhere in the Sacramento River system. Maslin and McKinney (1994) collected fall-run Chinook salmon, spring-run Chinook salmon and steelhead juveniles in the lower three miles of Stony Creek. Corwin and Grant (2004) linked capture of steelhead (and spring-run Chinook salmon) in Lower Stony Creek to specific hatchery releases upstream in the Sacramento River or at Coleman National Fish Hatchery (H.T. Harvey and Associates 2007a).

- Stony, maps, p. 5

- References [extensive; here are those with the word Stony plus 3 others specifically referenced above] :

-- Corwin, R.R. and D. J. Grant. 2004. Lower Stony Creek Fish Monitoring Report, Glenn County, California, 2001-2004. U.S. Bureau of Reclamation, Northern California Area Office, Mid-Pacific Region, 146 pp.; [Richard Corwin, Principal Investigator](#)web

page.

- - GCRCD (Glenn County Resource Conservation District). 2009. Lower Stony Creek Restoration Plan. January 12, 2009. Also available online at: http://www.glenncountyrcd.org/nodes/educationoutreach/documents/DWR_Report_30_draftPlan.pdf (Accessed April 30, 2009)-
- - H.T. Harvey & Associates. 2007b. Stony Creek Watershed Assessment, Volume 1. Lower Stony Creek Watershed Analysis. Prepared for Glenn County Resource Conservation District. Available online at: <http://www.glenncountyrcd.org/nodes/educationoutreach/LowerStonyCreekWatershed.htm> (Accessed April 30, 2009)
- - H.T. Harvey & Associates. 2007a. Stony Creek Watershed Assessment, Volume 2. Existing Conditions Report. Prepared for Glenn County Resource Conservation District. Available online at: <http://www.glenncountyrcd.org/nodes/educationoutreach/LowerStonyCreekWatershed.htm> (Accessed April 30, 2009)
- - Lindley, S. T., R. Schick, B. P. May, C. Hanson, A. Low, D. McEwan, R. B. MacFarlane, C. Swanson, and J. G. Williams. 2004. Population Structure of Threatened and Endangered Chinook Salmon ESU's in California's Central Valley Basin. SWFSC-360.
- - Lindley S.T., R.S. Schick, E. Mora, P.B. Adams, J.J. Anderson, S. Greene, C. Hanson, B.P. May, D.R. McEwan, R.B. MacFarlane, C. Swanson, and J.G. Williams. 2007. Framework for Assessing Viability of Threatened and Endangered Salmon and Steelhead in the Sacramento-San Joaquin Basin. San Francisco Estuary and Watershed Science Volume 5, Issue 1 (February 2007), California Bay-Delta Authority Science Program and the John Muir Institute of the Environment, Article 4. Available at: <http://repositories.cdlib.org/jmie/sfews/vol5/iss1/art4>
- - Swanson, M.L. and G.M. Kondolf. 1991. Geomorphic Study of Bed Degradation in Stony Creek, Glenn County, California. Prepared for California Department of Transportation, Division of Structures, 15 May 1991.
- - USBR (U.S. Bureau of Reclamation). 1998. Lower Stony Creek Fish, Wildlife and Water Use Management Plan. U.S. Bureau of Reclamation, Northern California Area Office, Mid-Pacific Region.
- - U.S. Department of Agriculture, Forest Service. 1995. Watershed Analysis Report, Grindstone Creek Watershed Analysis Area.

2. [Appendix B - Threats Assessment](#)

- Stony, pp. vii,3-85,4-89 thru 4-93, 4-136
- Stony, graphs & tables, pp. 1-5,4-132,4-133
- Stony, maps, p. 4-10
- 5.0 Literature Cited [extensive; here are those with the word Stony] :
- - NMFS. 2002b. Final Biological Opinion on Lower Stony Creek Water Management Operations.

p. 4-89 - 4-93

4.3.10 NORTHWESTERN CALIFORNIA DIVERSITY GROUP

4.3.10.1 STONY CREEK

Stony Creek is a westside stream originating in the Coast Range and draining into the Sacramento River south of Hamilton City. There are three storage reservoirs in the watershed. The lowermost dam, Black Butte, is a barrier to anadromous fish. The GCID canal crosses Stony Creek downstream of Black Butte Dam and consists of a seasonal gravel dam constructed across the creek on the downstream side of the canal. This crossing not only allows the canal to

[p. 4-89]

continue flowing south but it also allows capture of Stony Creek water and is a complete barrier to salmon migration. The GCID berm was removed in 1999. Although steelhead spawning has not been documented in Stony Creek in recent years, there is now access to suitable spawning habitat for steelhead in the creek, following the removal of the GCID berm, and it is reasonable to assume that water management can and will have an effect on steelhead numbers, distribution and reproduction in Stony Creek (NMFS 2002b).

ADULT IMMIGRATION AND HOLDING

PASSAGE IMPEDIMENTS/BARRIERS

From the confluence with the Sacramento River, Stony Creek extends 24.6 miles upstream to Black Butte Lake, impounded by the Black Butte Dam. Black Butte Dam presents an impassable barrier to anadromous fish migration and marks the upstream extent of currently accessible steelhead habitat (NMFS 2002b). Four miles downstream of Black Butte Dam is the North Side Diversion Dam that operates during the irrigation season and also for flood control. The Diversion Dam may present a partial obstacle to upstream migration.

HARVEST/ANGLING IMPACTS

Legal harvest of salmonids (5 per day, 10 in possession except the portion of Stony Creek Middle Fork from Red Bridge upstream, only 2 per day) in Stony Creek is permitted from the last Saturday in April through November 15. For the remainder of the year, catch and release fishing with barbless hooks is allowed. [This is actually Middle Fork Big Stony - is there a salmonid population up there that is cut off from the rest of Stony by the 6 dams downstream?]

WATER TEMPERATURE

During the winter months, if flows permit access to upstream areas, water temperatures are likely suitable for steelhead immigration. [including on Middle Fork Big Stony?]

WATER QUALITY

The surface water quality of streams draining eastward from the Coast Range is generally poor. These streams generally have very high suspended sediment loads due to the metavolcanic bedrock and schist formations which produce clays that stay in suspension during turbulent flow conditions. Soil disturbance within these watersheds can accelerate erosion and sedimentation processes and lead to increased metal and nutrient concentrations. High concentrations of metals and nutrients are commonly present during both low flow and storm runoff events. These concentrations frequently exceed water quality criteria established for the protection of beneficial use or the maintenance of aquatic life. Total phosphorus concentrations are at stimulatory levels for algae (DWR Website 2007b).

FLOW CONDITIONS

A minimum flow of 30 cfs is required to be released from Black Butte Dam year round.

SPAWNING

PASSAGE IMPEDIMENTS/BARRIERS

Black Butte Dam represents the upstream extent of currently accessible steelhead habitat. Most of the habitat in Stony Creek that may be suitable to steelhead spawning occurs in the four mile

[p. 4-90]

reach upstream of the Northside Diversion Dam (NDD). In most years, diversions at the NDD have ceased by mid-November, prior to the initiation of steelhead spawning migrations, and do not resume until late March. During periods of non diversion at NDD, flashboards are removed from the crest of the dam and a large drum gate on the east side of the dam is often raised to allow creek flows to pass through this section of the dam. The level of obstruction caused by the dam during the periods when flashboards are removed is unknown, however a cursory visual inspection of the dam by a NMFS engineer has indicated that the dam is unlikely to pose a significant passage barrier for adult steelhead (NMFS 2000b).

HARVEST/ANGLING IMPACTS

Harvest of steelhead in Stony Creek is permitted up to November 15 which may affect early spawning steelhead.

WATER TEMPERATURE

During the winter months, when steelhead spawning in Stony Creek would occur, water temperatures are cool enough to support spawning steelhead without adverse effects. However, water temperatures can rise quickly in the spring, potentially leading to mortality of late spawned embryos. Water temperature data collected at the Black Butte gage indicate that conditions for juvenile steelhead or developing embryos may become too warm as early as mid-April suggesting that successful steelhead spawning could only continue until mid-February (NMFS 2002b).

WATER QUALITY

See the discussion on water quality above in the adult immigration section.

FLOW CONDITIONS

The Stony Creek watershed is characterized by cool, wet winters with high flows during the steelhead spawning

period.

SPAWNING HABITAT AVAILABILITY

Current habitat conditions in Stony Creek are at best, marginal (NMFS 2002b). Although in recent years, steelhead spawning has not been documented in Stony Creek, some salmon spawning has been observed near the confluence with the Sacramento River (NMFS 2002b). The construction of Black Butte Dam has blocked the recruitment of spawning gravel to downstream areas. A substrate study conducted in 1998 concluded that 'nearly all samples possessed a level of fine particles (sand) within the level of concern for salmonid reproduction' (NMFS 2002b).

PHYSICAL HABITAT ALTERATION

Construction of dams and subsequent water diversions have depleted streamflows and contributed to higher water temperatures, lower dissolved oxygen levels, and decreased gravel and large woody debris recruitment. The existing streamflow conditions downstream of Black Butte Dam are highly dependent on flood control operations and water diversions.

HATCHERY EFFECTS

Because Stony Creek likely does not support a persistent population of steelhead, it is likely that hatchery steelhead compose a significant portion of any spawning population that may exist.

[p. 4-91]

EMBRYO INCUBATION

HARVEST/ANGLING IMPACTS

Stony Creek is open to recreational fishing year round. Some disruption of redds could occur as a result of wading anglers.

WATER TEMPERATURE

Water temperatures in Stony Creek during the winter and early spring months are cool enough to support steelhead embryo incubation. Late spawning would likely result in embryos experiencing unsuitable to lethal conditions.

WATER QUALITY

See the discussion on water quality above in the adult immigration section.

FLOW CONDITIONS

Flows in Stony Creek during the embryo incubation period are highly dependant on flood control and water storage operations which may lead to of redd dewatering during drier years. Day-to-day flow fluctuations due to flood control operations can be large, on the order of 100 to 1300 percent of the previous days flow, and range in magnitude of from several hundred to 6,000 cfs.

JUVENILE REARING AND OUTMIGRATION

WATER TEMPERATURE

Water temperatures in lower Stony Creek during the summer months are likely too warm to support juvenile steelhead rearing.

WATER QUALITY

See the discussion on water quality above in the Adult Immigration section.

FLOW CONDITIONS

Flows in Stony Creek during the summer months are maintained at a minimum of 30 cfs, however, because of often lethal water temperatures during the summer months steelhead juveniles are likely not present.

LOSS OF RIPARIAN HABITAT AND INSTREAM COVER

The lower reach of Stony Creek has been significantly altered by the construction of floodcontrol levees and bank protection measures (i.e., riprapping). These measures have resulted in reduced habitat for juvenile steelhead. Additionally, Stony Creek is heavily inundated with arundo (*Arundo donax*) and tamarisk (*Tamarix parviflora*), one of the worst infestations in a watershed in the north state. This impairs native riparian vegetation recruitment.

LOSS OF NATURAL RIVER MORPHOLOGY AND FUNCTION

Channel modification projects designed to prevent flood-related damage (e.g., levee construction and bank riprapping) have degraded natural processes which serve to recruit gravel, provide instream cover and forage, and provide habitat diversity in lower Stony Creek. In addition to the levee construction, Stony Creek's heavily braided reach is partly due to instream gravel removal

[p. 4-92]

practices, and in part due to arundo (*Arundo donax*) and tamarisk (*Tamarix parviflora*) infestation, along with the disruption of natural sediment routing processes due to dams. These affect the natural channel migration patterns and morphology, thus affecting migration (i.e., stranding, entrainment, etc.) of both adults and juveniles.

LOSS OF FLOODPLAIN HABITAT

The construction of levees bank riprapping, instream gravel removal practices and infestation of arundo (*Arundo donax*) and tamarisk (*Tamarix parviflora*) in the of lower Stony Creek have disconnected the channel from its historic floodplain thereby preventing the recruitment of large woody debris and natural processes associated with periodic floodplain inundation.

ENTRAINMENT

If adult steelhead are able to pass the NDD and successfully spawn in the reach above the dam, operation of the NDD and North Canal are likely to adversely affect juveniles hatched above the structure. Throughout much of the irrigation season the majority of the water flowing down Stony Creek is diverted into the unscreened North Canal where they are unlikely to survive (NMFS 2002b).

PREDATION

Sacramento pikeminnow is likely the most important predator of juvenile salmonids in Stony Creek. While the pikeminnow is native to these waters, habitat alteration may have changed the predator prey dynamics in the system conferring an advantage to pikeminnow.

HATCHERY EFFECTS

It is possible that some hatchery steelhead released at the CNFH, enter Stony Creek and may compete with naturally spawned steelhead for resources or prey on smaller outmigrating juvenile steelhead.

3. Attachments to Threats Assessment

1. [Spring-run Stressor Matrix](#) [No Stony, which doesn't make sense since the historical references specifically mention Spring run]
2. [Steelhead Stressor Matrix](#) [Stony, p. C-64,65,66,67,68,69, 70,71,72,73,74,75,76,77,78, 80,81,82,83,84, 170,171,172,173,174 [mostly multiple times per page]
3. [Winter-run Stressor Matrix](#)[No Stony]

4. [Appendix C - Recovery Actions Tables-Implementation Schedule](#); Stony pp. 4,5,6,8,9, 11,12,14,15,16,18,19, 20,21,22,23,24,25,27,28, 30,31,33,35,36,37,38,39, 40,41,42,44,45, 62, 145, 169, 170,171,173,174,175,177,178 [some pages multiple times]

5. [Appendix D - TRT Reports](#) ;

- Population Structure of Threatened and Endangered Chinook Salmon ESU in California's Central Valley Basin., April 2004, S.T. Lindley, R. Schick, B.P. May, J.J. Anderson, S. Greene, C. Hanson, A. Low, D. McEwan, R.B. McFarlane, C. Swanson, and J.G. Williams
 - Stony, pp. iv,24 ;
 - Stony, Graphs & Tables, pp. 6,7,8,14,15,17,18,19,40 ;
 - Stony, Maps pp. 47,48,50,51,52,53,54,55,56 ;
 - References

- Historical Population Structure of Central Valley Steelhead and its Alteration by Dams., *San Francisco Estuary & Watershed Science*, February 2006, Steven T. Lindley, Robert S. Schick, Aditya Agrawal, Matthew Goslin, Thomas E. Pearson, Ethan Mora, James J. Anderson, Bernard May, Sheila Greene, Charles Hanson, Alice Low, Dennis McEwan, R. Bruce MacFarlane, Christina Swanson and John G. Williams. ; References
 - Stony, Graphs & Tables, pp. 10,12
 - Stony, Maps pp. 6,8,13
- Monitoring and Research Needed to Manage the Recovery of Threatened and Endangered Chinook and Steelhead in the Sacramento-San Joaquin Basin., NOAA Tech. Memo.NMFS-SWFSC-399, 2007, J.G. Williams, J.J. Anderson, S. Greene, C. Hanson, S.T. Lindley, A. Low, B.P. May, D. McEwan, M.S. Mohr, R.B. MacFarlane, and C. Swanson ; References
- Framework for Assessing Viability of Threatened and Endangered Chinook Salmon and Steelhead in the Sacramento-San Joaquin Basin. *San Francisco Esuary & Watershed Science* February 2007, Steven T. Lindley, Robert S. Schick, Ethan Mora, Peter B. Adams, James J. Anderson, Sheila Greene, Charles Hanson, Bernard P. May, Dennis R. McEwan, R. Bruce MacFarlane, Christina Swanson, John G. Williams ; References
- Directed Connectivity among Fish Populations in a Riverine Network. *Journal of Applied Ecology*, 2007, Robert S. Schick and Steven T. Lindley ; References
 - Stony, 6th page

6. [Appendix E - Habitat Restoration Cost References](#)[No Stony ; Costing, References and more]

- [October 2009 Public Workshops](#) [irrel.]
- [Public Workshop Registration](#) [irrel.]
- Public Workshop Materials
 - [Recovery Strategy Summary](#) [Stony on map 5th page]
 - [Summary of the Public Draft Recovery Plan](#) [Stony on 2 maps 4th page]

[There are comments in the old official Fish and Game publications indicating that CDFG introduced catfish, carp, and bass to California; what would the effect on salmon be from these introduced fish?]

CALIFORNIA INDIAN LITERATURE:

- *The Ethno-Geography of the Pomo and Neighboring Indians*, by S.A. Barrett, Berkeley, The University Press, February 1908; vol. 6, *University of California Publications in American Archaeology and Ethnology*, CILC B36 E8 1908

p. 240 "fish were to be had at certain seasons in the streams."

p. 243 "about 1840 [fn 269 See p. 198 - (not included here)], the Indians of Big valley organized a party which went over to a fish dam on the head of Stony creek and ambushed two Northeastern Pomo fishermen, killing them as they came to the dam to look after their traps...." ["the head"? up in the canyon or down at the confluence of Big & Little? was it a salmon weir?]

- A.L. Kroeber, *Handbook of the Indians of California*, Dover Publications, Inc., New York, 1989? Dover ed first published in 1976, republication of GPO 1925 as "Bulletin 78" of the Bureau of American Ethnology of the Smithsonian Institution; preface A.L. Kroeber, Berkeley, Calif. 02/01/1923 p. VIII "It has appeared necessary to omit references to the sources and authorities for my statements." [so, no footnotes, no references; thus substantial portions within this book are block quoted, without references, very disappointing] CILC K72 H3 1976

p. 236, quoted material:

"For something like 10 years no revenge was taken. Then a Clear Lake party went to the head of Stony Creek [which is where?] and lay in wait by a dam. When fishermen appeared, two of them were killed..."; [this is a block quote, similar to Barrett 1908 p. 243, but no attribution]

- *The Patwin and their Neighbors*, by A.L. Kroeber, *University of California Publications in Archaeology and Ethnology*, v. 29 No. 4, pp. 253-425, 6 figures in text, 1 map, University of California Press, Berkeley, California 1932 CILC\K72\P3\1932\

Hill Patwin pp. 289-297, animal food p. 294

p. 295, "Most of the hill Patwin had little opportunity to fish on a large scale except in their neighbors' territory. Salmon, for instance, ran up Stony creek through Wintun as far as Salt Pomo territory. [is this in general, or a specific boundary?] Perch; suckers, hoyo; pike, tsues; hardheads, de'lbutil, were the chief varieties to be had at home. They were dived for in holes. Hooks are said not to have been used. The harpoon head was of bone. Nets were either short seines attached to a stick at each end, or the usual small dip-net fastened to a half-hoop at the end of a handle--two or three of which might be held abreast by as many men, the fish often being driven with poles. [again no cites, so, where did Kroeber get these quotes?]

- Archaeology of the Black Butte Reservoir Region, Glenn and Tehama Counties, California, San Francisco State College Anthropology Museum Occasional papers Number 2, 02/1969, Adan E. Treganza and Martin H. Heickson, Stony Creek Nomlaki [from studies largely in 1961 before the reservoir was filled]:

p. 8 "Salmon and steelhead probably still ascend Stony creek; present muddy conditions offer little key to the past fish populations."

p. 27 "The latter, rather than being a awl, may have been part of a compound fish spear."

p. 29 "The lack of animal and fish bone was surprising. As this site has geographic proximity to the bone-rich Central Valley sites, it was assumed that the midden content would be similar."

p. 31 "...no fish bone remains...."

p. 32 "...nine pieces of pointed bone probably used as barbs for fish spears (Fig. 2, e-i)."

p. 41 "Stony Creek has a meandering seasonal course between the two opposite stream terraces and maintains a fairly steady annual flow. It has no outstanding record as a salmon or steelhead stream so areas selected for village locations were probably based upon distribution of plant food and favorable protected areas rather than upon fishing." [based on? contradiction between pp. 8 & 41?]

CALIFORNIA HISTORICAL LITERATURE:

- *Back in Time, Stonyford Community History* compiled and written by Joyce Bond, Beulah Vanlandingham, and Sharkey Moore; Angie Hudson, computer/typesetter, May 1993 :

p. 67 A Tale of Colusa County, by Homer Durham, [same narrative & author as *Wagon Wheels*, vol. 3 #2 (May 1953), pp. 6-7 [I have not yet found the source for this comment]

"Among the hill Indians, the Stonyford Tribe was considered unusually fortunate. The acorn harvest never entirely failed, edible roots were abundant on the bottom lands and the uplands produced wild oats. The tribe controlled Stony Creek (Bee-dah) at the head of the salmon run where the salmon fishing season continued from early spring to late summer."

Stonyford Tribe were Northeast Pomo or "Salt Pomo"; see generally *Salt Pomo: An Ethnography*, Helen McCarthy, 1100 Dartmouth Place, Davis, CA 95616 *Journal of California and Great Basin Anthropology*, Vol. 8, No. 1 pp. 24-36 (1986), which unfortunately makes no mention of Stony Creek Salmon

Also from *Back in Time, Stonyford Community History* :

p. 308, *The Garlin Ranch of Stonyford*, by Marilyn Weldon, in turn from *Our Land in History*, in *Sacramento Valley Landowner*, Spring 1989 [have not yet found this publication],

"The first man to visit what is now the Garlin ranch area was General John Bidwell, one of California's foremost explorers, in 1844. According to historical records, the Pomo Indians had never seen a white man before. 'The number of whites before the discovery of gold could, I think, be counted on the fingers of one hand... 10,000 Indians ... they were curing SALMON from the stream...' (from Will S. Green -- *History of Colusa County*) [I have not yet found the source for this quote which does not seem to be in Mr. Green's History ; his history and later copy-cat histories mention the population of 10,000 building weirs and curing salmon on the Sacramento River, but not on Stony Creek - locating the exact source for the quote is tricky because General Bidwell wrote parallel articles for a number of publishers in his later years.]

[para] The Bidwell party camped by Stony [p. 309] Creek (Capay River in Indian times). The Indians had never seen horses; they were curious and friendly, and lived mostly on acorns, grasshoppers, and on the salmon which were abundant in Stony Creek." [I have not yet found the source for this "abundant" assertion either; and "Capay River" is apparently redundant]

- article, "San Francisco Chronicle Outdoors, Monday April 12, 1993, Glen Martin, "In the Field, Salmon Still Suffering in Stoney Creek"; resurrection of Stony Creek salmon was promised as a RBDD mitigation, never happened -- from Ap. 18115 file

LITIGATION FILES:

- Before Reclamation, the fishery above Black Butte was wonderful - following is extracted from the unrefuted [testimony of Senator & Judge](#)

[Purkitt](#) in the Angle transcripts recalling from when he was 5 or 6 years old, June 1881, pp. 483-4:

A. Well, now, the first I

[p. 484]

remember of that ditch-- We had a cottage at Fouts Springs, and every year, in those days, my folks went to Fouts Springs, along in June and remained there until September. Now, I don't recall so much about it in '80, but in '81 we camped there and took our lunch at the gravel near the big rocks, and my sister Edna was just a baby--just crawling around--she was born in August, and she was just sitting up--I fix it in that way--she was just sitting up--and at that time there were a lot of Indians diving into the hole there, and we camped there for dinner and fed the horses. We had a four-horse team, going to the mountains there--there were no automobiles in those days--and we camped there at a little gravel bar right below the rocks, and fed the team--and there were a number of Indians right there where we were camped--and, oh, 50 or 100 young Indians were diving into that hole and catching fish. They were catching them by hand, too--they didn't have any fish hooks--they were diving in and getting them by hand....

[& p. 487]

A. I think it was in the latter part of June; I am basing my answer on the fact that we nearly always went to the mountains--Fouts Spring--because we had a cottage there.

Comments in SWRCB ap file 18115 and in email traded with a NMFS representative suggest that these fish were SALMON from a run extirpated by successive RECLAMATION activities in taking control of the stream

- There are many references within the SWRCB Ap. 18115 files (including the Lower Stony Creek Management Plan, 1998, above), see [index of the case](#), including :

PROTEST & PETITION aimed at RESTORING SALMON ON STONY CREEK:

- Protest against 40-year extension of Black Butte storage and diversion, filed 10/01/2009: [Table of Contents](#) (not filed, prepared later); [Forms](#), [Supplement](#), [Exhibits](#) - A mini-EIR/EIS on what Reclamation did to the environment and the people of the upper Stony Creek Watershed
 - [SWRCB rejection](#) of my protest, (contrast their form-letter rejections with what they do after the protest is dead and gone, such as the CSPA protests in the 1990s followed by exactly the type of environmental review CSPA requested, see the 18115 index) ;
 - [first follow up letter](#) ,
 - [second follow up letter](#)
 - [first petition](#) ;
 - [second petition](#) ; [points & authorities in support](#) ; [Ap. 18115 protests](#) ; [possible issues list](#) ; [salmon page at 01/12/2009](#) ; [Ap. 18115 Orders, Decisions, Decrees, Environmental Reviews](#) ;
- and my related Motion filed [12/21/2009 Doc #307](#) to require changes in practices of the Water Master, Motion Hearing set for 02/08/2010, reset for 04/05/2010 at 10:00 AM before Senior Judge Lawrence K. Karlton. (Attachments:
 - [#307-2](#) # 1 Memorandum in support of Motion,
 - [#307-3](#) # 2 exhibits in support of motion,
 - [#307-4](#) # 3 proof of service, CM/ECF,
 - [#307-5](#) # 4 proof of service, mail,
 - [#307-6](#) # 5 proposed order) before the next step

MENDOCINO NATIONAL FOREST Plans & Reports

[pending]

CALFED Plans & Reports

[pending]

[Return to Stony Creek Water Wars.](#)

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