

PROJECT TITLE: Tagging of Green Sturgeon for Estimation of Population Size and Range of Migrations.

Hoop Valley Tribal Council, Fisheries Department

Abstract:

A project initiated in 1992 by Hoopa Valley Tribal Council Fisheries Department sought to produce information about population size and migration patterns of green sturgeon from the Klamath-Trinity basin using mark-recapture methods and rewards to fishers for initial capture, and recapture of tagged fish. Over a five year period twenty-two green sturgeon were tagged the Klamath River, and three in the Trinity. Seven fish tagged in the Klamath were recaptured up to 133 days after, and twenty-seven miles away from the time and location of initial capture. There were no extra-basin recaptures. Tagging in future seasons may be shifted to the time of fall out-migration to reduce likelihood of immediate recapture.

Introduction:

Funding of \$ 14,058.00 was awarded by U.S. Fish and Wildlife Service, under Cooperative Agreement 14-48-0001-92507, for Project 92-FP-11: "Green Sturgeon Migration Study" beginning in FY 1992. The objective of the program was to tag and release green sturgeon captured in the Hoopa and Yurok tribal subsistence fisheries, to provide harvest, life history, and population information on that species. After modifications and extensions, the project is presently referenced as # 92-HP/FP-11.

Methods:

Under procedures of the study, live green sturgeon captured by Tribal net fishers in the Klamath and Trinity rivers could be made available for tagging and release in exchange for reward money. On initial tagging of a green sturgeon, the fisher received a reward of \$50.00 from HVT Fisheries. On recapture of a previously tagged sturgeon, the fisher received a reward of \$25.00 by returning the tag(s), information on capture location, and total fish length. The reward was dependent on returning a tag or tags in such condition that identification of the original tagged fish was possible. One of the goals of the project was to tag one hundred green sturgeon in the Klamath and Trinity Rivers.

Two different types of tags were attached to each fish. A spaghetti tag (wire with codes printed on a plastic coating) was applied through the tissue behind the dorsal fin. A plastic "sheep tag" was clipped on to the opercle (gill covering). Later the sheep tag was applied to a pectoral fin to lessen stress on the fish. Tags were numbered such that either tag could be used to identify a fish.

A co-operative agreement between Hoopa Tribal Fisheries Department and Yurok Tribal Fisheries Department established methods for tagging and data collection in the Klamath River within the Yurok Reservation, and payment of award money to Yurok fishers. Because most captures of green sturgeon reported to project personnel occurred in the Klamath River, the majority of inspection and tagging of green sturgeon was done by

BIA or Yurok Tribal fisheries technicians stationed at the Klamath Field Office. Three green sturgeon were tagged in the Trinity River by personnel of the Hoopa Valley Tribal Department of Fisheries. There were no recaptures of fish tagged in the Trinity River.

Results:

The majority of tagging and recapture of green sturgeon in the study occurred in 1993. Below is a table summarizing numbers of green sturgeon observed in the study, and reward money paid.

Year	Captured and Tagged	Recaptured	Paid for Tagging	Paid for Recapture	Reward Total \$
1993	19	6	19	5	1075
1994	1	0	1	0	50
1995	0	0	0	0	0
1996	3	1	3	0	150
1997	2	0	2	0	100
Sums	25	7	25	5	1375

Payment was made to fishers for recapture of tagged fish if the information returned was considered adequate based on the request posted in public notices. Fishers frequently returned only one of the two tags, but this was considered adequate if the identifying number was present. In no case did fishers who recaptured tagged green sturgeon include a length measurement, except for a few visual approximations.

All recaptures of tagged green sturgeon occurred in the Klamath River, and were of fish originally captured and tagged in the Klamath that same year. Below is a table summarizing information from recaptures. Positive distance in river miles signifies distance upstream.

Date Captured	Release Location	Date Recaptured	Recapture Location	Days at-large	River Miles Traveled
05/01/93	Sealth / Klamath Glen	09/11/93	Lamb's Riffle	133	+ 6
05/01/93	Upper Starwein	06/11/93	Mettah/Notchko	41	+23
06/10/93	Mennow/ Klamath Glen	06/17/93	Moore's Rock	7	+20
06/10/93	Mennow/ Klamath Glen	08/20/93	Young's Bar	71	+25
06/30/93	Salath/Klamath Glen	07/22/93	Terwer Ck	22	+ 3
06/30/93	Salath/Klamath Glen	07/24/93	Klamath Mouth	24	- 8
09/20/96	Young's Bar	09/30/96	Blake's Riffle	10	-27

These data are consistent with the observation that green sturgeon migrate up the rivers in spring on their spawning run, and leave the rivers in the fall. Data from 1993 suggest that there may be as high as a 20% probability that green sturgeon tagged during their upstream migration will be re-captured during the same year. We are considering the possibility that tagging during the fall may be more likely to generate useful information on migrations of green sturgeon from the Klamath-Trinity drainage. Tagging sturgeon in

the lower Klamath River during out-migration should increase the probability of tagged fish entering the ocean. As this study was intended to gather information on the extra-basin migration of sturgeon, we are interested if sturgeon captured in Humboldt Bay, Willapa Bay, or Grays Harbor, WA. may have originated in the Klamath basin.

The much larger numbers of green sturgeon tagged and recaptured in 1993 relative to other years may reflect both the relative abundance of sturgeon and the degree of participation of fishers in the program. Comments by Desmond Williams, Yurok Tribal Department of Fisheries, to Hoopa Fisheries personnel suggest that participation by fishers is the most difficult problem overall. "I've heard of several large catches of sturgeon in the estuary, but no one has offered any." (July 23, 1993). It may be that tribal fishers don't consider the reward offered (\$50.00) a sufficient incentive to forgo using the fish for food. This might especially apply when larger green sturgeon are caught. The reward offered for recaptures is smaller. In that case, however, the fish can be used and the tags can be returned for a reward. Despite various difficulties, fish continue to be tagged and recaptured, although in lower numbers than in 1993.

Conclusions:

Biological data gathered in this study are of significant value. All fish tagged and released were measured. Twenty of the 25 were weighed. Measurement or weighing of those fish that may be recaptured in future years will provide unique information on green sturgeon growth. Fin ray specimens were taken from 15 of the 25 specimens tagged to date for genetic tissue samples. Photos were taken of 11 specimens.

As of October 21, 1996, \$ 11,368.00 remained of the original \$ 14,058.00 funding awarded by U.S. Fish and Wildlife Service in 1992. In 1997, \$150.00 has been paid out in tag rewards. In fact, the cost-to-benefit ratio produced by this project has been very favorable.

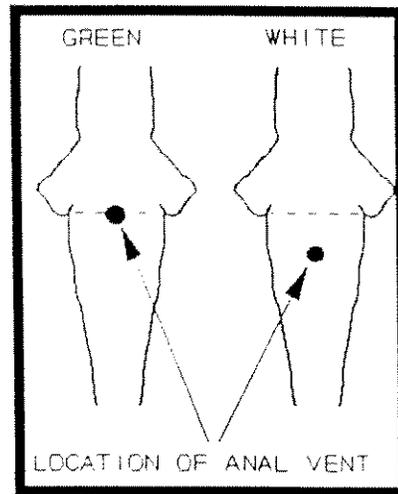
Because observations of captures and recaptures of green sturgeon in this study do not occur as part of a monitored fishery, the data gathered may have limited value for population estimation. For example, it is unknown whether reporting frequency is the same for both captures and recaptures of green sturgeon. However, the data illustrate important features of the Klamath and Trinity River subsistence gill net fisheries. Information gained about the migration patterns of green sturgeon in the river, and possibly also in the ocean, will be of significant value. This project should be continued in the future with improved methods. The relatively small numbers of observations produced by this study, and the difficulties of effectively sampling this relatively scarce but valuable species in remote locations, do not diminish the importance of continuing research on the green sturgeon of the Klamath-Trinity Basin.

Specific objectives for future work include:

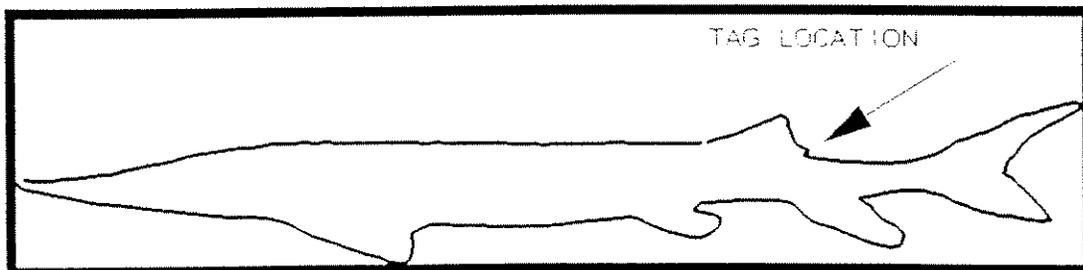
- (1) Tag fish only in the Lower Klamath River during the fall out-migration when food value and potential for immediate recapture are low.
- (2) Retain an account balance in future years to pay rewards for tag recaptures.
- (3) Release a sufficient number of tags so that at least 100 green sturgeon remain at-large one year past marking.

REWARD MONEY TO TRIBAL FISHERMEN FOR LIVE GREEN STURGEON AND TAG RECOVERIES

Bureau of Indian Affairs staff are seeking the cooperation of Tribal fishermen to assist in a green sturgeon tagging program. Rewards are available for live, healthy, adult green sturgeon captured by Tribal fishermen. Reward money in the amount of \$50.00 will be payable, by requisition through the Yurok Interim Council, for each green sturgeon tagged and released. The tagging program is intended to gather information on the migration of Klamath-Trinity green sturgeon populations. Green sturgeon are the predominant sturgeon species of the Klamath-Trinity Basin. White sturgeon also occur in these waters, but are not the focus of this project: **NO REWARDS WILL BE PAID FOR WHITE STURGEON.**



Fishermen should also inspect sturgeon for the presence of tags (located behind the dorsal fin). Fishers providing information on capture location, date, and total fish length, may submit recovered tags for a \$25.00 reward.



Contact the Bureau at (707) 482-6421 for more information or to make tagging arrangements.

92-FP-11

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