CRUISE REPORT
Central Valley-Bay Delta Branch
Sport Fish Monitoring Program
29 June 2005

VESSEL(S): CDFG R/Vs New Alosa

CRUISE DATES: 05 April - 19 May 2005

PROJECT: Adult Striped Bass Population Study (Gill Net Tagging)

OBJECTIVE: To tag adult striped bass and document previously tagged fish for an ongoing mark-recapture program to estimate abundance and mortality rate.

METHODS:
From 05 April to 19 May 2005, we drifted variable-mesh gill nets (length: 100 fathoms; depth: 21'; mesh: 4", 4.5", 5.5") at 4 stations in the western Delta. From the 42-foot vessel New Alosa, we sampled primarily in the lower Sacramento and San Joaquin rivers near Antioch. Further upstream in the Sacramento River near Knight's Landing, striped bass were also sampled with fyke traps for this study. (Results of fyke trapping are reported separately.) In response to observed catch by location, gill net sampling was cancelled earlier this year to shift personnel to the fyke traps upriver.

The minimum gill netting crew size was three, including one experienced Vessel Mate, one experienced Biologist or Environmental Scientist, and one Scientific Aide. Typically, a fourth crew member assisted with fish marking and data collection (Scientific/Seasonal Aide) or vessel operation (Fish and Wildlife Technician). We departed from and returned to Lloyd's Holiday Harbor in Antioch four days per week, typically Mondays -Thursdays. Nets were fished between 0800 and 1500 hrs. Drift locations depended on a variety of factors, including striped bass location, sea lions, bass boats (or other high speed watercraft), anchored boats, wind speed, wind direction, tide, and river current.

Gill nets were constructed with stringers, creating shallow pockets where fish might be encased rather than gilled. We began reeling in the net no more than twenty minutes after it was first set. (The 20-minute limit was established in the past in effort to limit mortality or stress in incidentally caught salmonids.) All fish were removed as the net was reeled in. If fish were removed faster than they could be processed, we held them temporarily in plastic tubs of water. All fish were released on-site after processing. To avoid personnel injury (needles, spines, accidents caused by distractions) or loss of data (samples blown overboard or errors in data collection), the vessel did not move forward until tagging crews processed all fish and secured the data.

Striped bass (*Morone saxatilis*) were measured to the nearest centimeter fork length (cm FL). Legal-sized striped bass (greater than or equal to 42 cm FL) were measured, sexed, and marked with a disk-dangler tag (Floy Manufacturing Co.). Ninety percent of the tags were marked with a return address and no reward. The remaining 10% had rewards of $20, $50, or $100. We attached tags by inserting two hypodermic needles below the dorsal fin, guiding tag wires through the needle openings, removing the needles, and twisting the tag wires together. This year we also experimented with T-bar tags (Floy Manufacturing Co.) applied approximately 2-cm aft of the disk dangler tag on a small number of fish.

If a captured fish was already marked, its tag number was checked to determine the year it was released. Fish tagged previously this season were released with no information recorded, except toward the end of the tagging season when a few tag numbers were recorded. As in the past, we routinely recorded tag number, cm FL, and sex from fish tagged in previous years. We also counted legal-sized fish that escaped or were released intentionally (recorded as "over") or did not survive (recorded as "dead"). Sublegal striped bass were measured and counted.

Chinook salmon (*Oncorhynchus tshawytcha*) and steelhead (*O. mykiss*) lengths were estimated, not measured, in an effort to release them as quickly as possible without further stress. Condition and coloration was also noted, along with presence or absence of steelhead adipose fins. Green sturgeon *(Acipenser medirostris*) were also measured if caught. These data were collected for IEP reporting purposes, and no data were collected from other species.

RESULTS AND DISCUSSION:

The total number of drifts was 145. We averaged 5.6 drifts and 66.7 tagged fish per day. Of 1865 legal-sized striped bass observed, we tagged 1734 (including 28 with T-bar tags) and recaptured 7 from previous tagging years. Most tagged fish were 40-60 cm FL (Figure 1).

We released 107 legal-sized striped bass alive and unmarked (recorded as "over"). Thirteen died and another 9 were killed for separate studies on fecundity and otolith chemistry. We also landed 127 sublegal striped bass.

Last year the average daily number of drifts (5.7) was similar and we tagged fewer legal-sized striped bass (43.6) per day. The total catch of legal-sized striped bass (1714) was lower while the number of recaptures (15) and sublegal striped bass (170) were higher.

The experimental T-bar tagging had some problems but should not be ruled out, as only a few tags were applied late in the season. With this technique, the tagging gun was often jammed when tags were off track. Although not analyzed statistically, the jamming seemed to occur less frequently with more swift, machine-like triggering of the tag gun.

However, this method can cause physical problems for the tagger. One experienced crew member had to ice the hands after tagging approximately 80 fish in this manner on the fyke trapping survey. Future attempts should target a more optimal balance between speed and hand fatigue. T-bar tag location will also need further exploration. Some tags did not reach the spinal rays. Depth of the tag varied by girth of the fish, not an issue with the disk-dangler tags, and likely influenced tag retention. Too few fish were tagged for statistical analyses and we chose not to alter the traditional disk-dangler tag location for comparison of retention between the two tag types. However, a shorter retention time may be acceptable for future research objectives and we will continue to explore the feasibility of using T-bar tags next year.

As in the past, tagged fish from this year's sampling were recovered in the gill nets, although only a few were recorded toward the end of the season. The fyke trap sampling crew began recording this year's tagged fish earlier, but only tag numbers were recorded. *In future surveys, we will document the tag number, length, and sex of current-year tagged fish*. These data may allow us to track accuracy in sexing and measuring striped bass and determine whether condition is compromised after repeated capture. The data may also provide information on the short-term fate of newly tagged fish. For example, we presently do not know when or how many fish tagged in gill nets are encountered upstream in the fyke traps later in the season, or vice-versa.

Past surveys have also not consistently documented reasons for releasing legal-sized striped bass untagged or noting suspected causes of mortality. For example, while entangled in our nets, numerous striped bass, and other fishes, were injured or killed by sea lions. The number and size distribution of fish lost to sea lion predation was unknown and difficult to estimate because many of those fish were not landed. This year we observed sea lions removing and eating at least 36 striped bass, but these observations were not always noted, and it was uncertain whether the fish were legal-sized. Fish have also escaped or been released untagged for intentional reasons such as apparent disease or severe gilling. *In the future, we will document reasons or suspected causes when striped bass are recorded as "over" or "dead".*

Salmonid bycatch consisted of 3 Chinook salmon and 2 steelhead with no mortalities. No green sturgeon were observed. Bycatch which were not recorded included hundreds of American shad (*Alosa sapidissima*), a few white sturgeon *(Acipenser transmontanus)*, and one largemouth bass *(Micropterus salmoides)*. In previous years, the relative catch of salmonids and American shad was higher, possibly because gill netting extended later into May and early June. In 2004, for example, most of the 31 Chinook salmon were caught in the latter half of the survey. Species other than salmonids and sturgeon have not previously been documented on gill netting surveys. Sturgeon have not been measured or counted consistently and were not identified to species in some years. *For more thorough documentation of bycatch in future sampling, we will record this information on a datasheet similar to that currently used by the fyke trapping crew.*

For its second consecutive year gill netting striped bass, the New Alosa performed well. Among several expectations, the New Alosa was to provide the versatility and extra

space needed for improved fish holds and additional scientific activities. The additional deck space facilitated collection of samples for fecundity and otolith studies. Other expectations could be better met with a few modifications to the vessel rigging. As was the case last year, the water hose on the New Alosa was an improvement over using buckets to supply fresh water to fish holds. However, the hose had to be moved by hand back and forth across the deck to both tubs. *In future sampling, the New Alosa should be rigged for an improved freshwater supply system that does not require a crew member to move hoses back and forth during tagging. (Example: install a release flow valve and replace water hose with hoses that split to both tubs and can be left running during tagging.)*

SUMMARY OF RECOMMENDED CHANGES

Data management

* Record tag number, length, and sex of current-year recaptures.

* Document reasons or suspected causes when striped bass are recorded as "over" or "dead" (examples: escaped, diseased, severely gilled, injured by sea lion, or killed by sea lion).

* Record bycatch information on a datasheet similar to that currently used by the fyke trapping crew.

Equipment

* Rig the New Alosa for an improved freshwater supply system that does not require a crew member to move hoses back and forth during tagging. (Example: install a release flow valve and replace water hose with hoses that split to both tubs and can be left running during tagging.)

DISPOSITION OF DATA:

Striped bass data - Nina Kogut, CDFG, 4001 N. Wilson Way, Stockton, CA 95205

Chinook salmon and steelhead data - Heather McIntire, CDFG, 4001 N. Wilson Way, Stockton, CA 95205

PERSONNEL:

Mike Silva	Vessel Mate	CDFG, Stockton, CA
Ken Flowers	Vessel Mate	CDFG, Stockton, CA

Paul Macias	Fish and Wildlife Technician	CDFG, Stockton, CA
Marty Gingras	Senior Biologist	CDFG, Stockton, CA
Nina Kogut	Associate Biologist	CDFG, Stockton, CA
Dennis Michniuk	Biologist	CDFG, Stockton, CA
Samantha Vu	Environmental Scientist	CDFG, Stockton, CA
Patricia Lowe-Lippe	Scientific Aide	CDFG, Stockton, CA
Victoria Lopez	Scientific Aide	CDFG, Stockton, CA
Phillip Voong	Scientific Aide	CDFG, Stockton, CA
Lisa Espitia	Seasonal Aide	CDFG, Stockton, CA
Dave Kohlhorst	Volunteer (Ret. Senior Biologist)	CDFG, Stockton, CA

Fork Length Frequency Distributions by Week

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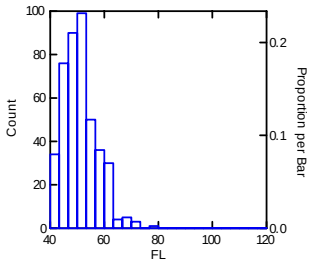

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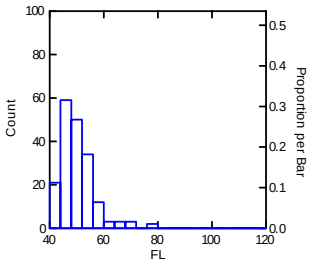

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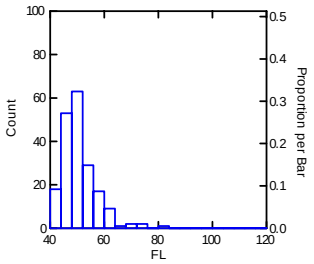

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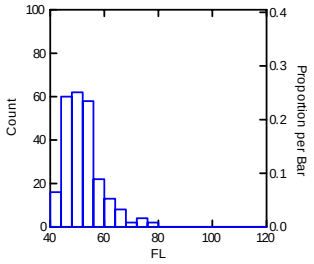

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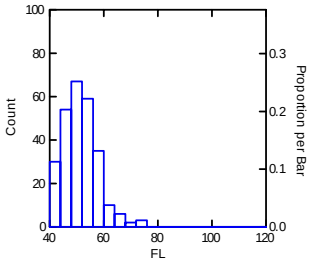

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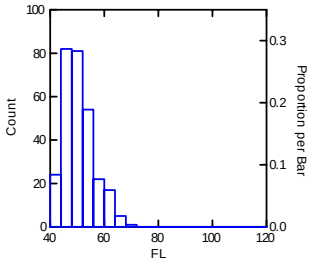

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