

STUDY PERFORMANCE REPORT

State: Michigan

Project No.: F-80-R-1

Study No.: 464

Title: Coded-wire tag and oxytetracycline marking of salmonines in the Great Lakes and tributary streams and data base management for tagged fish returns and weir and survey data

Period Covered: October 1, 1999 to September 30, 2000

Study Objective: To coded-wire tag and adipose fin clip, or mark with oxytetracycline, experimental lots of fish at state fish hatcheries. To design, develop, and manage databases for research studies which utilize coded-wire tags (CWT) or oxytetracycline (OTC), harvest weir data, and survey data from Charlevoix Fisheries Research Station research studies. To convert all past Charlevoix Fisheries Research Station mainframe and personal computer data files into a common personal computer-based format.

Summary: Approximately 800,300 chinook salmon were marked with a coded-wire tag and adipose fin clip in 2000; no other salmonine species were marked with CWTs. Tag retention for individual lots of fish ranged from 79-94% and averaged 86.3%. Marked and unmarked Atlantic salmon, brown trout, chinook salmon, coho salmon, lake trout, and rainbow trout were sampled from index surveys, sport fisheries, tribal fisheries, weirs, and fish ladders. Approximately 7,700 salmonines with CWTs were processed from the 1999 collection. Rainbow trout (N=3,733 fish), lake trout (N=2,491), and chinook salmon (N=1,301) accounted for the majority of fish collected in 1999 for CWT processing.

Job 1. Title: Mark fish and conduct quality control.

Findings: Approximately 800,300 chinook salmon received a coded-wire tag and adipose fin clip in 2000. Tag retention was high, averaging 86.3%, and ranged from 79 to 94% for individual lots of fish (Table 1). No other salmonine species were marked with CWTs in 2000. The number of fish marked in 2000 was similar to the previous five years and significantly fewer than that marked during the first five years of CWT marking at the Charlevoix Fisheries Research Station (Table 2).

Job 2. Title: Sample marked and unmarked fish.

Findings: Marked and unmarked Atlantic salmon, brown trout, chinook salmon, coho salmon, lake trout, and rainbow trout were collected in 1999 from index stations using various gear types, from sport fisheries by roving headhunters, from tribal fisheries, and from harvest weirs (Table 3). These collections resulted in proportional samples of marked and unmarked fish. Additional, non-proportional samples of marked fish were obtained from the sport fisheries through creel census (Study 427), fishing tournaments, and anglers and charter boat operators who observed an

adipose-fin clipped fish and voluntarily returned the head to a designated drop-off site (Table 3). Some non-proportional samples of CWT fish were also collected at fish ladders (Study 487). Collection of marked and unmarked fish is ongoing during 2000 from the same sources utilized in 1999.

Job 3. Title: Read CWT and OTC marked fish.

Findings: All adipose-clipped fish collected during the 1999 field season (see Job 2) were examined for presence of a CWT; tags were removed, read, and recorded in a database. Data were provided to other researchers and managers (both within and outside the MDNR) as requested. A significant portion of work in this job involves data sharing and exchange with other state and federal agencies.

A total of 7,682 CWT fish collected in 1999 have been processed at the Charlevoix Fisheries Research Station (Table 3). This number likely represents most of the fish caught in 1999 with CWTs that will be turned in for analysis, although volunteer anglers may continue to return some fish. Rainbow trout (3,733 fish) were the species with the highest number of CWTs recovered and processed, followed by lake trout at 2,491, and chinook salmon at 1,301 (Table 3). The majority (68%) of the returns was from the sport fisheries through volunteers and the creel census program (Study 427). The number of fish processed in 1999 (7,682 fish) was the sixth highest for the fourteen year period 1986-1999 (Table 4).

Job 4. Title: Prepare annual report.

Findings: This Performance Report was completed as scheduled.

Job 5. Title: Develop data base structures and do data entry.

Findings: Databases been corrected to standardize data codes and fields, allowing users to link and work with multiple databases. In addition to the databases maintained at Charlevoix Fisheries Research Station (index surveys, creel census, and coded-wire tag), compatibility with databases maintained by other Michigan Department of Natural Resources (MDNR) units has been ensured. These units include the Fish Health Laboratory, Fish Production Section, and Fisheries Information Management Section.

Data entry has been completed for all CWTs collected during 1999 using the standard entry format that was developed previously. The entry form utilized simplifies the entry process and greatly reduces errors. Visual basic programming allows for automatic searches of the extensive volunteer and CWT databases.

Information on stocking and capture locations is entered in formats that are compatible with GIS (geographic information systems) mapping programs. Recording locations in decimal degree formats and standardizing entries allows for more efficient use of information obtained from within the coded-wire tag database spatial and movement analyses.

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Date: September 30, 2000

Table 1.—Number of fish marked with coded-wire tags and stocked in 2000 by species and stocking location. Number tagged is not corrected for tag retention or fin clip rates.

Species (Strain)	Study ID	CWT #	Age	Stocking Site	# Tagged	Tag Retention (%)	Stocking Date	Net Pen (Y/N)
Chinook salmon	513	59-17-50	SF	Medusa Creek, Charlevoix	102,067	85.3	06-01-00	Yes
	482	59-18-14	SF	Port Sanilac	82,723	94.4	05-15-00	No
	482	59-18-15	SF	Lexington	82,300	90.0	05-04-00	No
	482	59-20-03	SF	Au Gres River	61,495	84.5	05-16-00	No
	482	59-20-04	SF	Tawas City	63,510	91.0	05-19-00	No
	482	59-20-06	SF	Mill Creek, Harrisville	104,339	79.1	05-00-00	Yes
	482	59-20-07	SF	Port Austin	101,189	85.1	05-23-00	No
	482/513	59-49-13	SF	Swan River, Rogers City	101,731	88.0	05-16-00	No
	513	59-49-14	SF	Little Manistee River	<u>100,950</u>	<u>79.8</u>	05-19-00	No
Total					800,294	Avg. 86.3		

Table 2.—Number of fish marked and stocked with CWTs, 1990-2000. Number tagged is not corrected for tag retention or fin clip rates.

Year	Atlantic salmon	Chinook salmon	Lake trout	Rainbow trout	Other	All species
1990	0	1,140,491	98,361	142,618	0	1,381,470
1991	50,315	1,464,558	97,344	0	0	1,612,217
1992	51,498	1,328,518	111,000	0	0	1,491,016
1993	78,580	1,420,863	0	32,597	0	1,532,040
1994	35,259	1,423,681	100,303	35,476	0	1,594,719
1995	70,853	515,240	107,957	36,320	0	730,370
1996	48,101	515,282	0	349,727	0	913,110
1997	45,211	512,938	0	435,148	0	993,297
1998	54,159	485,634	59,200	392,172	0	991,165
1999	0	270,280	0	378,864	3,195	652,339
2000	0	800,294	0	0	10,744	811,038

Table 3.—Number of fish collected in 1999 from various sources and examined for the presence of coded wire tags. Tags were removed and read at the Charlevoix Fisheries Research Station. Percentage of total fish from each source and species is shown in parentheses.

Source	Gear type	Atlantic salmon	Brown trout	Chinook salmon	Coho salmon	Lake trout	Rainbow trout	Other	All species (% of total)	
Assessment / Index Samples										
	Gill net	23	0	5	1	226	2	0	257	(3.35)
	Electrofishing	0	0	1	0	0	18	0	19	(0.25)
	Other	0	0	0	0	0	4	0	4	(0.05)
Sport-Caught										
	Charter boat	2	0	51	0	109	151	0	313	(4.07)
	Creel clerk	9	28	178	5	436	1,041	0	1,697	(22.09)
	Headhunter	4	1	182	3	559	195	0	944	(12.29)
	Tournaments	0	0	5	0	439	126	0	570	(7.42)
	Volunteer	54	12	578	2	525	1,999	1	3,171	(41.28)
Tribal Samples										
	Gill net	0	0	30	0	197	0	0	227	(2.95)
	Other	6	6	0	0	0	0	0	12	(0.16)
Weir Samples										
	Harvest Weirs	0	0	271	0	0	20	0	291	(3.79)
	Fish Ladders	0	0	0	0	0	177	0	177	(2.30)
All Sources (% of total)		98 (1.28)	47 (0.61)	1,301 (16.94)	11 (0.14)	2,491 (32.43)	3,733 (48.59)	1 (0.01)	7,682	(100.0)

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Table 4.—Number of fish collected from various sources and examined for the presence of coded wire tags, 1990-99. Tags were removed and read at the Charlevoix Fisheries Research Station.

Year	Atlantic salmon	Chinook salmon	Coho salmon	Lake trout	Rainbow trout	Other	All species
1986	0	0	0	319	0	0	2,305
1987	0	2	0	65	0	0	2,054
1988	0	24	727	175	35	3	2,952
1989	0	48	3,281	628	176	5	6,127
1990	0	276	66	343	857	3	3,535
1991	0	1,347	30	717	1,362	6	5,453
1992	2	2,193	22	929	2,146	8	7,292
1993	85	2,975	33	1,039	737	14	6,876
1994	268	4,141	18	1,771	386	21	8,599
1995	104	4,916	14	2,918	252	6	10,205
1996	81	3,638	55	3,493	440	29	9,732
1997	212	2,355	52	3,476	546	31	8,669
1998	166	1,447	59	3,115	2,110	22	8,917
1999	98	1,301	11	2,491	3,733	48	7,682