

STUDY PERFORMANCE REPORT

State: Michigan

Project No.: F-80-R-8

Study No.: 230464

Title: Statewide coded-wire tagging and tag recovery program.

Period Covered: October 1, 2006 to September 30, 2007

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 main frame and personal computer data files into a common personal computer-based format.

Summary: Approximately 306,000 Chinook salmon *Oncorhynchus tshawytscha* were marked with a coded-wire tag and adipose fin clip in 2007. Tag retention for Chinook salmon ranged from 87-96% and averaged 93%. Marked and unmarked Atlantic salmon *Salmo salar*, brown trout *Salmo trutta*, Chinook salmon, coho salmon *Oncorhynchus kisutch*, lake trout *Salvelinus namaycush*, and rainbow trout *Oncorhynchus mykiss* were sampled from index surveys, sport fisheries, tribal fisheries, weirs, and fish ladders. Approximately 4,400 salmonines with CWTs were processed from the 2006 collections. Chinook salmon (N=3,245), lake trout (N=656), and coho salmon (N=493 fish) accounted for the majority of fish collected in 2006 for CWT processing.

Findings: Jobs 1 through 5 were scheduled for 2006-07, and progress is reported below.

Job 1. Title: Mark fish and conduct quality control.—Approximately 306,000 Chinook salmon were marked with a coded-wire tag and adipose fin clip in 2007 (Table 1). Tag retention averaged 93% and ranged from 87-96% across stocking sites (Table 1). Approximately 2,600 lake sturgeon *Acipenser fulvescens* were also marked with a coded-wire tag in 2007 (Table 2). The total number of fish marked in 2007 was significantly reduced from 2006 (Table 2).

Job 2. Title: Sample marked and unmarked fish.—Marked and unmarked Atlantic salmon, brown trout, Chinook salmon, coho salmon, lake trout, and rainbow trout were collected in 2006 from assessment samples, sport fisheries, tribal fisheries, and harvest weirs (Table 3). These collections resulted in proportional samples of marked and unmarked fish. Due to reduced budgets for state workers in summer 2006, tag collection efforts (proportional samples) were significantly reduced compared with previous years.

Additional, non-proportional samples of marked fish were obtained from the sport fisheries through creel census, 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. Collection of marked and unmarked fish is ongoing during 2007, from the same sources used in 2006.

Job 3. Title: Read CWT and OTC marked fish.—All adipose-clipped fish collected during the 2006 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 4,457 CWT fish collected in 2006 have been processed at the Charlevoix Fisheries Research Station (Table 3). This number probably represents most of the fish collected in 2006 with CWTs that will be turned in for analysis, although volunteer anglers may continue to return some fish. Chinook salmon (N=3,245) were the species with the highest number of CWTs recovered and processed, followed by lake trout (656) and coho salmon (493). Coho salmon tag returns increased significantly in 2006 as a result of the mass marking demonstration project conducted in 2005. Overall, the majority of tag collections were from sport fisheries (46%) and weir returns (47%). The total number of fish processed in 2006 was slightly lower than the average for the period 1990–2005 (Table 4).

Job 4. Title: Prepare five-year report for 2003–07.—A division technical report manuscript will be completed and submitted for publication to Research Section administrative staff by December 31, 2007.

Job 5. Title: Develop data base structures and do data entry.—Database maintenance and improvement work is ongoing. Data entry has been completed for all CWTs collected during 2006 using the standard entry format that was developed previously.

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Table 1.—Number of spring fingerling Chinook salmon marked with coded-wire tags and stocked in 2007, by stocking location. Number tagged is not corrected for tag retention or fin clip rates. Overall values are total fish for number tagged and average percentage for tag retention.

Study number	Stocking site	Number tagged	Tag retention (%)	Stocking date	Net pen (Y/N)
230513	Medusa Creek, Charlevoix	104,063	87.1	06-05-07	Yes
230513	Swan River, Rogers City	101,146	96.0	05-10-07	No
230513	Little Manistee River	101,431	95.8	05-10-07	No
Overall		306,640	93.0		

Table 2.—Number of fish marked with coded wire tags, 1990–2007. Number tagged is not corrected for tag retention or fin clip rates.

Year	Atlantic salmon	Chinook salmon	Lake trout	Rainbow trout	Lake sturgeon	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
2001	0	1,115,262	151,176	0	4,370	1,270,808
2002	0	1,090,252	0	0	9,456	1,099,708
2003	0	763,238	0	0	5,291	768,619
2004	0	760,079	0	0	7,322	767,401
2005	0	759,959	0	0	0	759,959
2006	0	725,052	0	0	7,962	733,014
2007	0	304,838	0	0	2,579	307,417
Total	433,976	15,396,549	725,341	1,802,922	50,919	18,409,707
Average (1990–2006)	25,528	887,748	42,667	106,054	2,844	1,064,841

Table 3.—Number of fish collected in 2006 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	Atlantic salmon	Brown trout	Chinook salmon	Coho salmon	Lake trout	Rainbow trout	Other	All species no	(% of total)
<u>Assessment/Index samples</u>									
Gill net	0	0	6	1	120	0	0	127	(2.8)
Electrofishing	0	0	12	0	0	0	0	12	(0.3)
<u>Sport-caught</u>									
Charter boat	0	0	67	67	3	2	0	139	(3.1)
Creel clerk	0	0	315	173	94	12	0	594	(13.3)
Headhunter	0	0	163	76	47	4	0	290	(6.5)
Tournaments	0	0	113	43	129	2	0	287	(6.4)
Volunteer	0	2	485	118	103	39	2	749	(16.8)
<u>Tribal samples</u>									
Gill net	0	0	0	0	160	0	0	160	(3.6)
Other	0	0	1	1	0	0	0	2	(0.0)
<u>Weir samples</u>									
Harvest weirs	0	0	2,083	0	0	0	0	2,083	(46.7)
Fish ladders	0	0	0	14	0	0	0	14	(0.3)
<u>Other</u>									
Other	0	0	0	0	0	0	0	0	(0.0)
All sources	0	2	3,245	493	656	59	2	4,457	
(% of total)	(0.0)	(0.0)	(72.8)	(11.1)	(14.7)	(1.3)	(0.0)		(100.0)

Table 4.—Number of fish collected from various sources and examined for the presence of coded wire tags, 1990–2006. 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
1990	0	276	66	343	857	3	1,545
1991	0	1,347	30	717	1,362	6	3,462
1992	2	2,193	22	929	2,146	8	5,300
1993	85	2,975	33	1,039	737	14	4,883
1994	268	4,141	18	1,771	386	21	6,605
1995	104	4,916	14	2,918	252	6	8,210
1996	81	3,638	55	3,493	440	29	7,736
1997	212	2,355	52	3,476	546	31	6,672
1998	166	1,447	59	3,115	2,110	22	6,919
1999	98	1,301	11	2,491	3,733	48	7,682
2000	84	749	18	2,512	3,821	27	7,211
2001	16	771	8	1,836	2,643	17	5,291
2002	1	1,794	48	1,431	1,424	10	4,708
2003	1	3,269	22	1,250	311	2	4,855
2004	0	3,706	30	930	111	14	4,791
2005	0	2,471	5	923	54	5	3,458
2006	0	3,245	493	656	59	4	4,457
Total	1,118	40,595	984	29,830	20,992	267	93,786
Average (1990–2005)	70	2,334	31	1,823	1,308	16	5,583