Triploid Trout Evaluation

Background

Triploid rainbow trout (*Oncorhynchus mykiss*) are infertile and have therefore been stocked in lakes across North America to support sport fisheries while minimizing the risk of introgression between hatchery and natural origin trout. In Washington State the Washington Department of Fish and Wildlife (WDFW) allocates approximately $3 million annually to stock hatchery origin rainbow trout in over 600 lakes. Because many of these lakes drain into anadromous waters that support wild *O.mykiss* listed as threatened under the Endangered Species Act there is a strong interest in understanding the costs and benefits associated with stocking sterile, triploid rainbow trout as an alternative to traditional diploids.

This study was designed to compare the relative success of triploids vs. diploids in put and take fisheries in lowland lakes of Western Washington. To do this we will utilize differential marks (adipose fin clips) and acoustic telemetry.

Study Goals

The objectives of this study are to 1) evaluate the relative contribution that triploid vs. diploids make to the put and take sport fishery, 2) compare the fine scale movements of triploids vs. diploids within the study lakes, 3) describe the relative rate of entrainment of the two groups and 4) estimate natural mortality of both diploid and triploid trout.

Study Area and Fish Collection

This study will stock approximately 75,000 diploid trout and 75,000 adipose fin clipped, triploid trout across 29 Western Washington Lakes (Table 1). All trout stocked will fall within the "catchable" size class (approximately 2.5 fish per pound) and will be stocked approximately 1 week prior to opening day of trout season (April 25, 2020). Creel surveys will be conducted on opening day of trout season at all study lakes.

In addition to differential marking, a subsample of fish released will be fitted with acoustic tags. In both Ward and Ohop lakes, 30 (15 diploid, 15 triploid in each lake, N=60 tagged trout) acoustically tagged trout will be planted one week prior to opening day of trout season. Each receiver (Figure 1) will be collecting temperature data of the surrounding environment where it resides. Tracking results will be compared with temperature data throughout the study area to better understand the role temperature plays in predicting trout movements and natural mortality.

Study Area

Figure 1. Study lakes and proposed locations of acoustic receivers (yellow circles) to evaluate the movement, catch rates and predation rates associated with rainbow trout stocking in Ward (A) and Ohop (B) lakes in Washington State, USA.

Figure 2. Study Area on Ward and Ohop Lakes. Yellow dots represent estimated receiver locations.

Table 1. Study schedule in 2020

Range Testing	Deploy Receivers	Tag Fish	Fish Stocking	Creel	Retreive Receivers	Data Processing
February-	April 1st-	April 1st-	April 15th-	April 25th-	September-	November-

Table 2. Characteristics of study lakes and stocking plan for triploid and diploid rainbow trout in Washington State, USA.

		Size	Number of Fish Stocked			Stocking Density
Lake Name	County	Surface Acres	Triploids	Diploids	Total	Fish/Surface Acre
Jackson Lake	Pierce	16	440	440	880	55
Crescent Lake	Pierce	47	1,293	1,293	2,585	55
Rapjohn Lake	Pierce	56	1,540	1,540	3,080	55
Deep Lake	Thurston	66	1,815	1,815	3,630	55
Ward Lake	Thurston	67	1,843	1,843	3,685	55
McIntosh Lake	Thurston	116	3,190	3,190	6,380	55
Harts Lake	Pierce	112	3,080	3,080	6,160	55
Clear Lake	Thurston	173	4,758	4,758	9,515	55
Clear Lake	Pierce	155		8,525	8,525	55
Hicks Lake	Thurston	160	4,400	4,400	8,800	55
Ohop Lake	Pierce	236	6,490	6,490	12,980	55
Pattison Lake	Thurston	257	7,068	7,068	14,135	55
Sandy Shore	Jefferson	35	960	960	1,920	55
Silent Lake	Jefferson	11	294	294	589	55
Tarboo Lake	Jefferson	20	558	558	1,117	55
Buck Lake	Kitsap	19	512	512	1,023	55
Haven	Kitsap	69	1,898	1,898	3,795	55
Horseshoe Lake	Kitsap	41	1,122	1,122	2,244	55
Mission Lake	Kitsap	86	2,354	2,354	4,708	55
Panther Lake	Kitsap	101	2,775	2,775	5,550	55
Wildcat Lake	Kitsap	109	2,995	0	5,990	55
Aldrich Lake	Mason	11	292	292	583	55
Benson Lake	Mason	80	2,195	2,195	4,389	55
Don Lake (Clara Lake)	Mason	14	391	391	781	55
Devereaux Lake	Mason	98	2,698	2,698	5,396	55
Lake Limerick	Mason	132	3,627	3,627	7,255	55
Magee Lake	Mason	23	619	619	1,238	55
Robbins Lake	Mason	17	454	454	908	55
Tiger Lake	Mason	107	2,932	2,932	5,863	55
Wooten Lake	Mason	70	1,925	1,925	3,850	55
Total			**64,512**	**70,043**	**137,550**	