



Summary of 2013 Northern Pike Suppression Results on Box Canyon Reservoir, Pend Oreille River, WA.

The second year of mechanical suppression of northern pike (NP) in Box Canyon Reservoir resulted in the removal of 6,452 northern pike (Table 1). Kalispel Natural Resources Department and Washington Department of Fish and Wildlife sampled 410 northern pike in the 2013 Spring Pike Index Netting (SPIN) Survey. This resulted in a catch per unit effort (CPUE) of 1.21 NP/ net-night (95% CI: 0.87-1.56), in sloughs and mainstem river between Riverbend and Pioneer Park campground, which met the target of ≤ 1.73 NP/net-night for these sections of the reservoir. The CPUE north of Riverbend was higher than the target of ≤ 0.50 NP/net-night (1.44 NP/ net-night) which triggered Phase 2 of the mechanical suppression effort.

In the initial year (2012) of mechanical removal of northern pike crews deployed 1,031 nets and removed 5,808 northern pike between March 19 and June 13. 4,552 northern pike were removed during Phase 1 (March 19 to April 22) for an overall CPUE of 9.30 NP/net-night; Phase 2 (April 27 to June 13) resulted in the removal of 1,256 northern pike with an overall CPUE of 2.48 NP/net-night. The 2012 SPIN survey took place between April 23 and April 26 with 60 nets deployed and 131 northern pike sampled. This resulted in a CPUE of 2.30 NP/net-night for all sloughs and the mainstem river south of Riverbend and CPUE of 0.80 NP/net-night for the mainstem river north of Riverbend.

Phase 1 - Mechanical Removal March 5-May 3:

- Netting took place in known slough spawning locations throughout the reservoir
- Two 2-3 man crews worked 5 days per week deploying 25-30 nets per day
- Collected biological information such as weight, length, sex and maturity on ~25% of net hauls
- Total nets deployed: 1,027 (46.9 Km/29.1 mi)
- Overall Phase 1 CPUE: 5.80 NP/ net-night

Phase 1 northern pike catch summary (Table 1):

- Total catch: 5,953 NP, 4.05 mT (8,938 lbs)
- Overall size range: 233-1,245 mm TL (9-49 inches), weight 83-14,800 g (0.2-32.6 lbs.)
- Males averaged 434 mm TL (17 inches)
- Females averaged 452 mm TL (18 inches)
- Females made up an estimated 48% of the total catch for Phase 1, of which an estimated 18% were mature, ripe or spawned out.
- Removed an estimated 484 mature pre-spawn females and 2,074 immature females
- 58% of NP catch was less than 450 mm TL (18 inches)

Spring Pike Index Netting May 6-May 9

- Net placement sites were selected using a reservoir-wide spatially balanced random sampling design
- Five 3 person crews deployed up to 50 nets/day
- Collected biological information such as weight, length, sex and maturity on all NP collected
- Total nets deployed: 197 (9.0 Km/5.6 mi)
- CPUE for the mainstem river north of Riverbend was 1.44 NP/net-night (target ≤ 0.5); CPUE for all sloughs and mainstem river south of Riverbend was 1.21 NP/net-night (target ≤ 1.73)

SPIN catch summary (Table 1)

- Total catch: 410 NP, 0.18 mT (406 lbs)
- Overall size range: 281-794 mm TL (11-31 inches), 125-2,901 g (0.3-6.3 lbs.)
- Males averaged 391 mm TL (15 inches), 401 g (0.9 lb)
- Females averaged 417 mm TL (16 inches), 514 g (1.1 lbs)
- Females made up 48% of the NP sampled of which 4% were either mature or spawned out
- 79% of the NP catch were less than 450 mm TL (18 inches)

Phase 2 – Mechanical Removal May 15-June 13

- Netting effort took place reservoir wide with an emphasis between Riverbend and Lone.
- One 3 person crew worked up to 4 days/week deploying 18-20 nets/day
- Collected biological information such as weight, length, sex and maturity on ~25% of net hauls
- Total nets deployed: 190 (8.7 Km/5.4 mi)
- Overall Phase 2 CPUE: 2.58 NP/net-night

Phase 2 northern pike catch summary (Table 1):

- Total catch: 499 NP, 0.23 mT (526 lbs)
- Overall size range: 285-736 mm TL (11-29 inches), weight 133-2,707 g (0.3-6 lbs.)
- Males averaged 408 mm TL (16 inches), 510 g (1 lb.)
- Females averaged 406 mm TL (16 inches), 497 g (1 lb.)
- Females made up an estimated 58% of the total catch for Phase 2, of which 8% were estimated to be spawned out
- 81% of NP catch in Phase 2 were less than 450 mm TL (18 inches)

Mechanical Removal Bycatch Summary:

- 20 fish species, 12,213 individuals, >90% survival (Table 3)
- Incidental catch included turtles, muskrats, waterfowl and cormorants

Table 1. Summary of the 2013 mechanical removal efforts and SPIN survey of northern pike in Box Canyon Reservoir.

	Suppression Phase I	SPIN Survey	Suppression Phase II
Sampling Dates:	March 5 – May 3	May 6- May 10	May 15 - June 13
Days per Week:	5	4	4
Nets/Day:	25 -30	50	18-20
Total Nets:	1,027	197	190
NP Catch-Per-Unit-Effort (CPUE):			
Weekly Mean CPUE Range:	9.5 to 3.1	N/A	3.7 to 2.1
Overall CPUE:	5.8	North: 1.44 Slough and South: 1.21	2.58
Percent Positive Catch:	96%	63%	77%
Most northern pike in one net:	62	14	15
NP Catch Statistics:			
Total Number:	5,953	410	499
Total Weight:	4.03 mT (8,894 lbs)	0.18 mT (406 lbs)	0.28 mT (635 lbs)
Size Range:	233-1,245 mm	281-794 mm	285-736 mm
Weight Range:	83-14,800 g	125-2,901 g	133-2,707 g
Mean TL Males:	434 mm	391 mm	408 mm
Mean TL Females:	452 mm	417 mm	406 mm
Sex Ratio (% female):	48%	48%	54%
Juvenile Catch (<450 mm):	56%	79%	78%

Table 2. Estimated maturity rates of all northern pike removed during mechanical suppression efforts (Phase 1 & 2 combined) in 2013.

Sex	Immature	Mature	Ripe	Spawned out
Female	82.2%	14.4%	0.9%	2.5%
Male	33.2%	54.9%	9.7%	2.2%

Table 3. 2013 Bycatch summaries of mechanical removal efforts. Observed survival rates were >95 % for Phase 1 and >90 % for Phase 2.

Common Name	Species Name	Phase 1 Total	Phase 2 Total	Grand Total
Salmonidae				
Rainbow Trout	<i>Oncorhynchus mykiss</i>	14	10	24
Kokanee	<i>Oncorhynchus nerka</i>	0	1	1
Lake Whitefish	<i>Coregonus clupeaformis</i>	4	9	13
Eastern Brook Trout	<i>Salvelinus fontinalis</i>	16	1	17
Brown Trout	<i>Salmo trutta</i>	106	35	141
Lake Trout	<i>Salvelinus namaycush</i>	1	4	5
Westslope Cutthroat Trout	<i>Oncorhynchus clarkii lewisi</i>	1	3	4
Esocidae				
Grass Pickerel	<i>Esox americanus vermiculatus</i>	3	0	3
Cyprinidae				
Peamouth	<i>Mylocheilus caurinus</i>	227	56	283
Northern Pikeminnow	<i>Ptychocheilus oregonensis</i>	99	50	149
Tench	<i>Tinca tinca</i>	1,639	767	2,406
Catostomidae				
Longnose Sucker	<i>Catostomus catostomus</i>	3	6	9
Largescale Sucker	<i>Catostomus macrocheilus</i>	89	75	164
Ictaluridae				
Brown Bullhead	<i>Ameiurus nebulosus</i>	507	144	651
Centrarchidae				
Pumpkinseed	<i>Lepomis gibbosis</i>	845	129	974
Smallmouth Bass	<i>Micropterus dolomieu</i>	40	146	186
Largemouth Bass	<i>Micropterus salmoides</i>	251	63	314
Black Crappie	<i>Pomoxis nigromaculatus</i>	1,220	54	1,274
Percidae				
Yellow Perch	<i>Perca flavescens</i>	5,435	145	5,580
Walleye	<i>Stizostedion vitreum</i>	10	5	15