

Study Update

Fish Distribution and Species Composition



Goals and Study Area

- Gain a better understanding of fish species composition and abundance in waters associated with the Packwood Lake Hydroelectric Project:
 - Packwood Lake
 - Tributaries to Packwood Lake
 - Lake Creek below the drop structure
 - Hall Creek
 - Snyder Creek

Methods

- A variety of methods are being used to gain an overall picture of the species composition and distribution within project affected waters:
 - Literature Review
 - Underwater Observation
 - Electrofishing
 - Spawning Surveys
 - Passive Net Sets

Literature Review

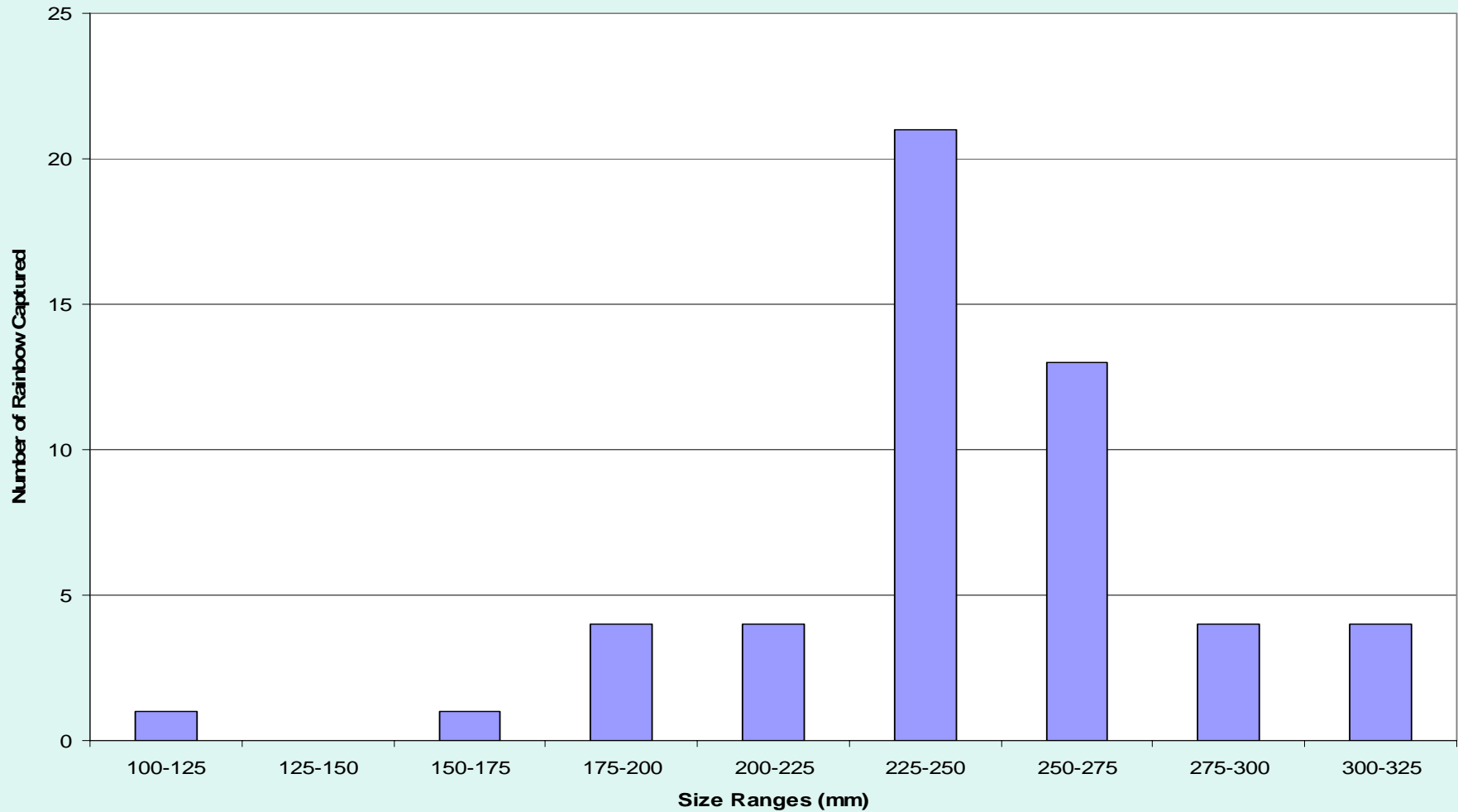
- A literature review is currently underway examining all relevant current and historical documentation related to:
 - Fish species presence/abundance
 - Spawning survey information
 - Creel survey records
 - Hatchery records
 - Biological assessments done on anadromous populations in the Cowlitz Basin
 - Genetic studies conducted

Packwood Lake

- Two net sets were done on Packwood Lake using 2 vertical and 2 horizontal floating gill nets
 - May 2nd and 3rd, 2006 (Overnight)
 - July 19, 2006
- Two nets were placed in approximately 15 ft of water off of the mouth of Osprey Creek
- Two nets were placed in approximately 20 ft of water off of the mouth of Upper Lake Creek
 - 52 rainbow were captured in the nets in front of Osprey Creek
 - 53 rainbow were captured in the nets in front of Upper Lake Creek

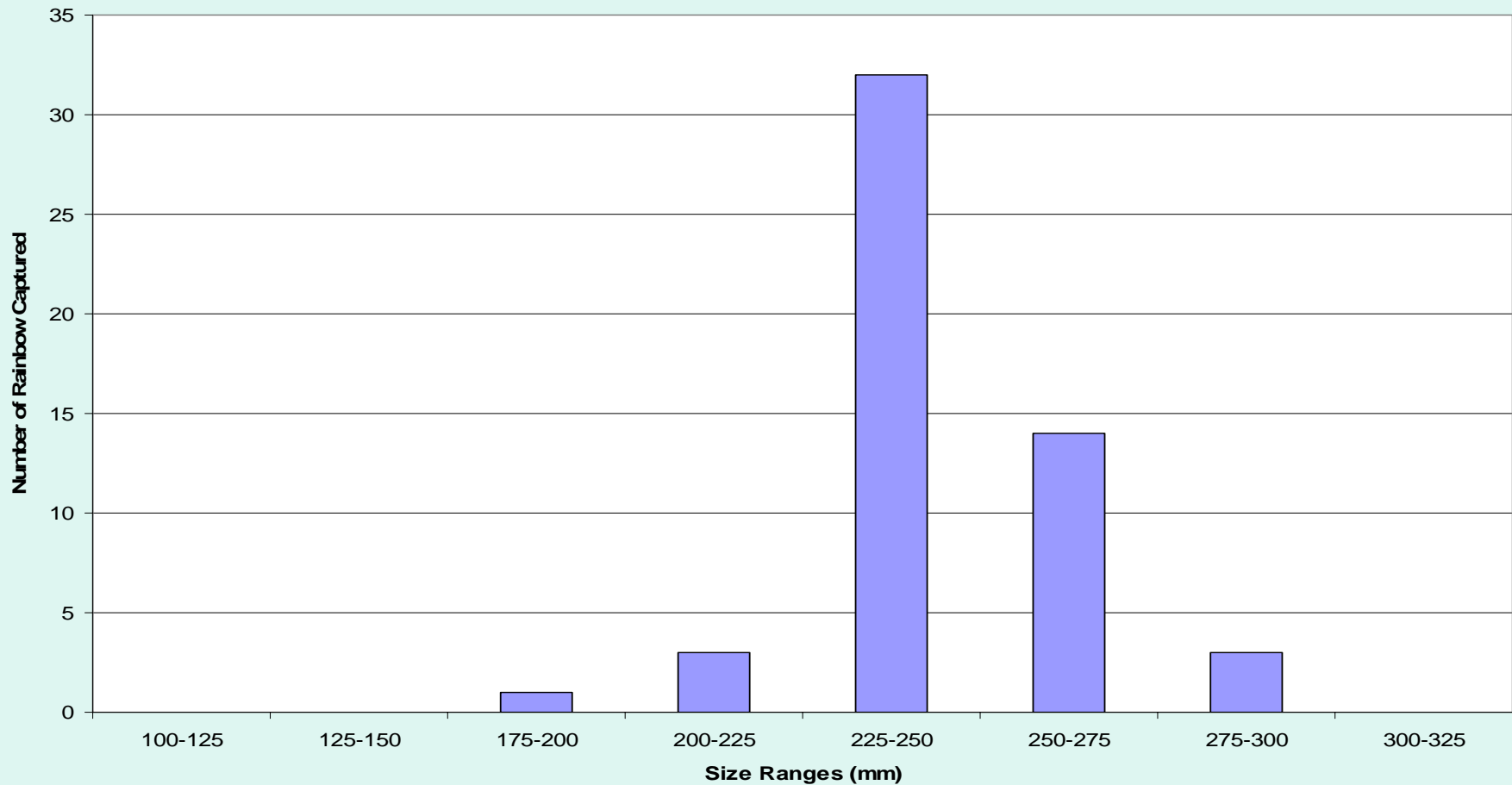
Length Distribution of Fish Captured in Packwood Lake Near Osprey Creek

**Netting at Osprey Point
(52 Total Rainbow Captured)**



Length Distribution of Fish Captured in Packwood Lake Near Upper Lake Creek

Upper Packwood Lake Netting
(53 Total Rainbow Captured)



Stream Surveys

- Reaches were analyzed 30 m out of every 160 m or 60 m out of every 320 m depending on overall length of the stream
- Fish species composition and distribution information was collected using a combination of electrofishing and snorkeling techniques
- Habitat characteristics were measured at all sites:
 - Habitat types
 - Habitat unit lengths
 - Substrate composition
 - Velocities

Tributary Surveys to Packwood Lake

- Upper Lake Creek (Snorkeled/Net at Mouth)
 - 60m/320m
- Crawford Creek (Electrofished/Net at Mouth)
 - 30m/160m
- Muller Creek (Electrofished/Net at Mouth)
 - 30m/160m
- Osprey Creek (Electrofished/Net near Mouth)
 - 30m/160m
- Trap Creek (Electrofished/Net at Mouth)
 - 30m/160m
- SE Trap Creek (Electrofished)
 - 30m/160m
- Beaver Bill Creek (Snorkeled)
 - 60m/320m

Tributary Fish Data (Summer 2006)

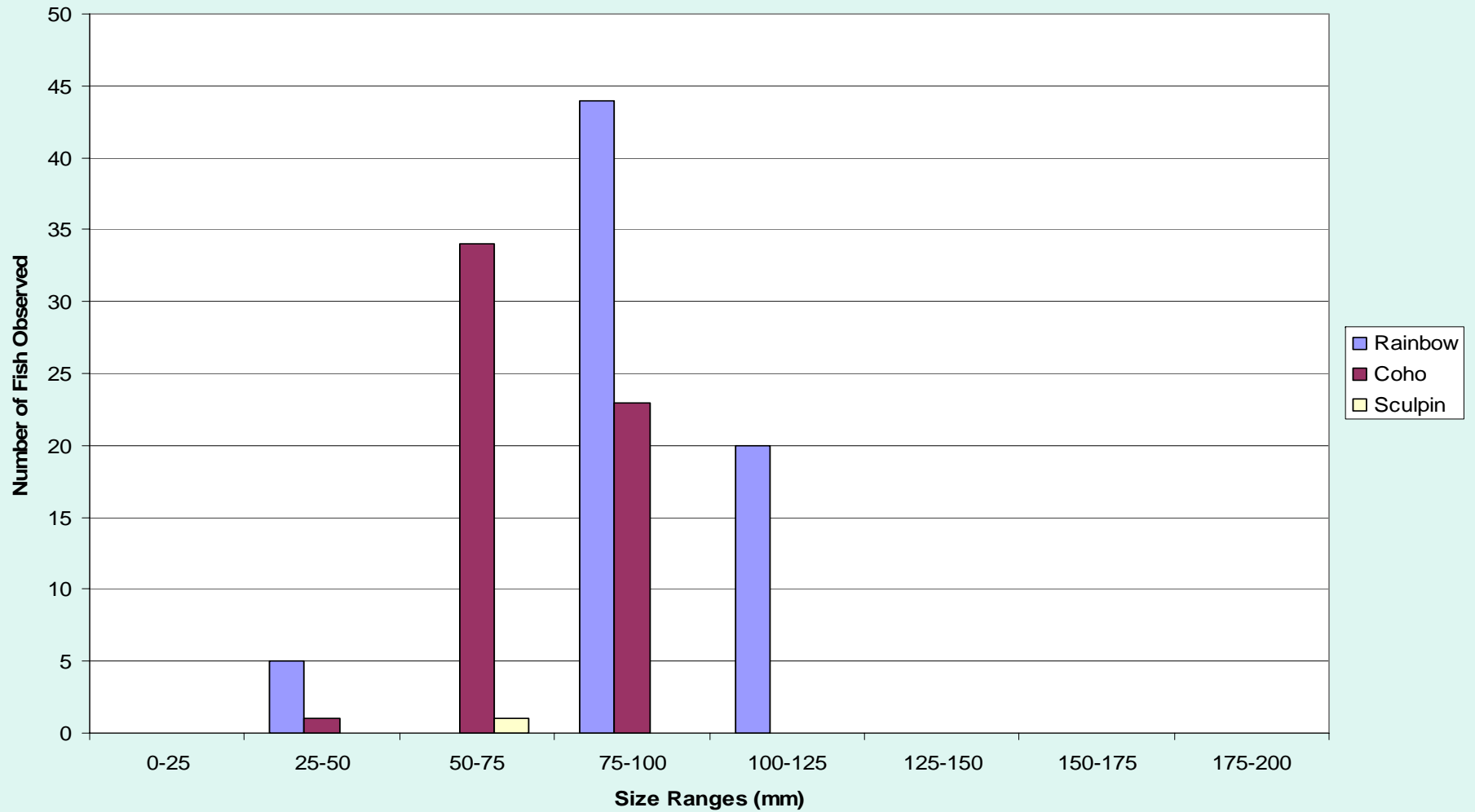
- Upper Lake Creek
 - 1 rainbow observed (approximately 120 mm)
- Crawford Creek
 - Hundreds of rainbow fry (less than 10 mm)
- Muller Creek
 - No fish observed
- Osprey Creek
 - No fish observed
- Trap Creek
 - No fish observed
- SE Trap Creek
 - No fish observed
- Beaver Bill Creek
 - 4 rainbow observed (approximately 20 mm)

Lower Lake Creek and Snyder Creek (Summer 2006)

- 5.4 miles of lower Lake Creek was surveyed using a combination of snorkeling and electrofishing techniques
- The nearly 0.4 miles of Snyder Creek above the crossing with the tailrace was electrofished
- Fish species distribution and composition data was collected
- The same habitat characteristics described above were documented also

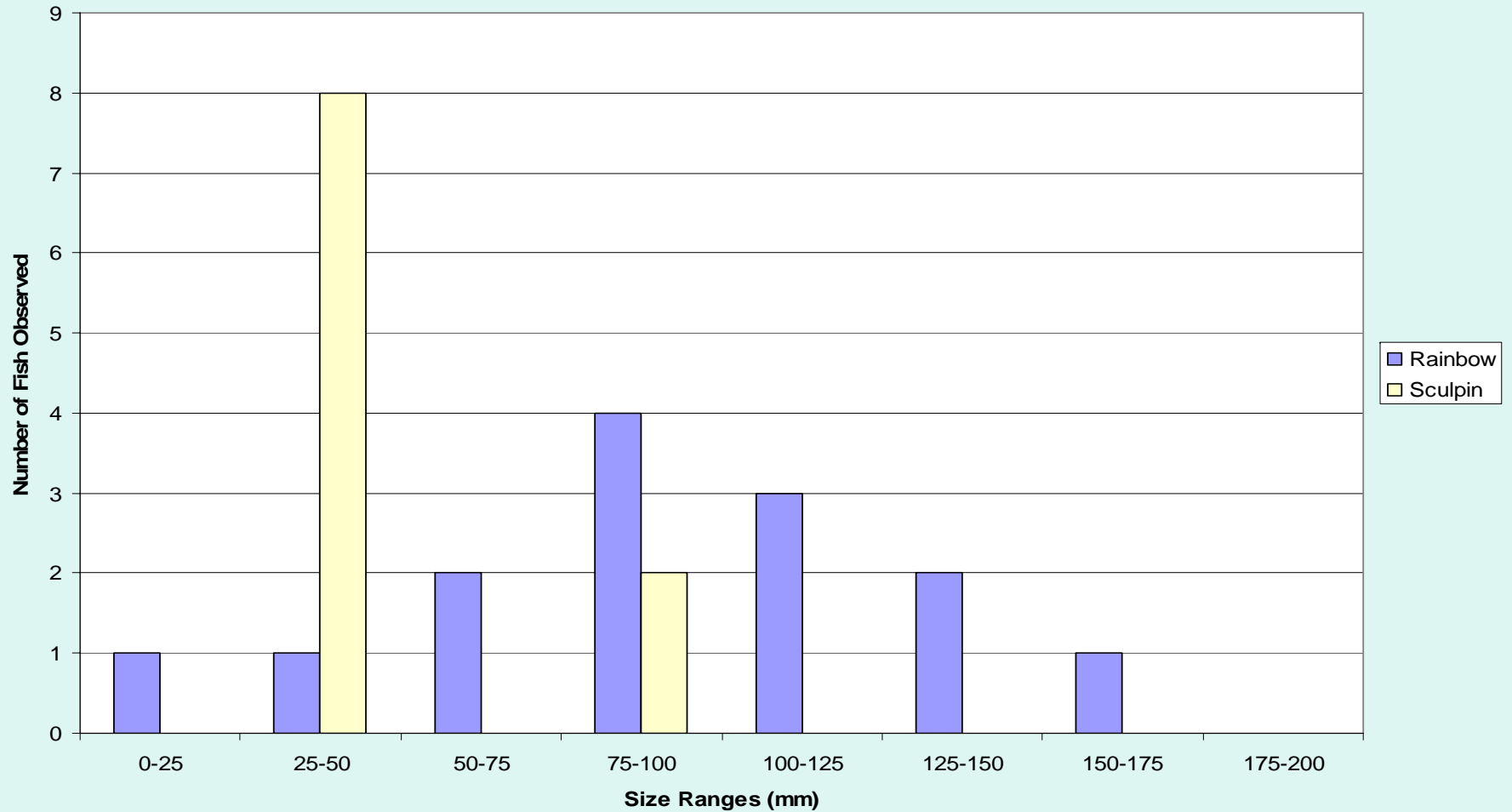
RM 0.0-1.0 (Snorkel)

Fish Snorkeling Observations for Lake Creek
(RM 0.0-1.0)



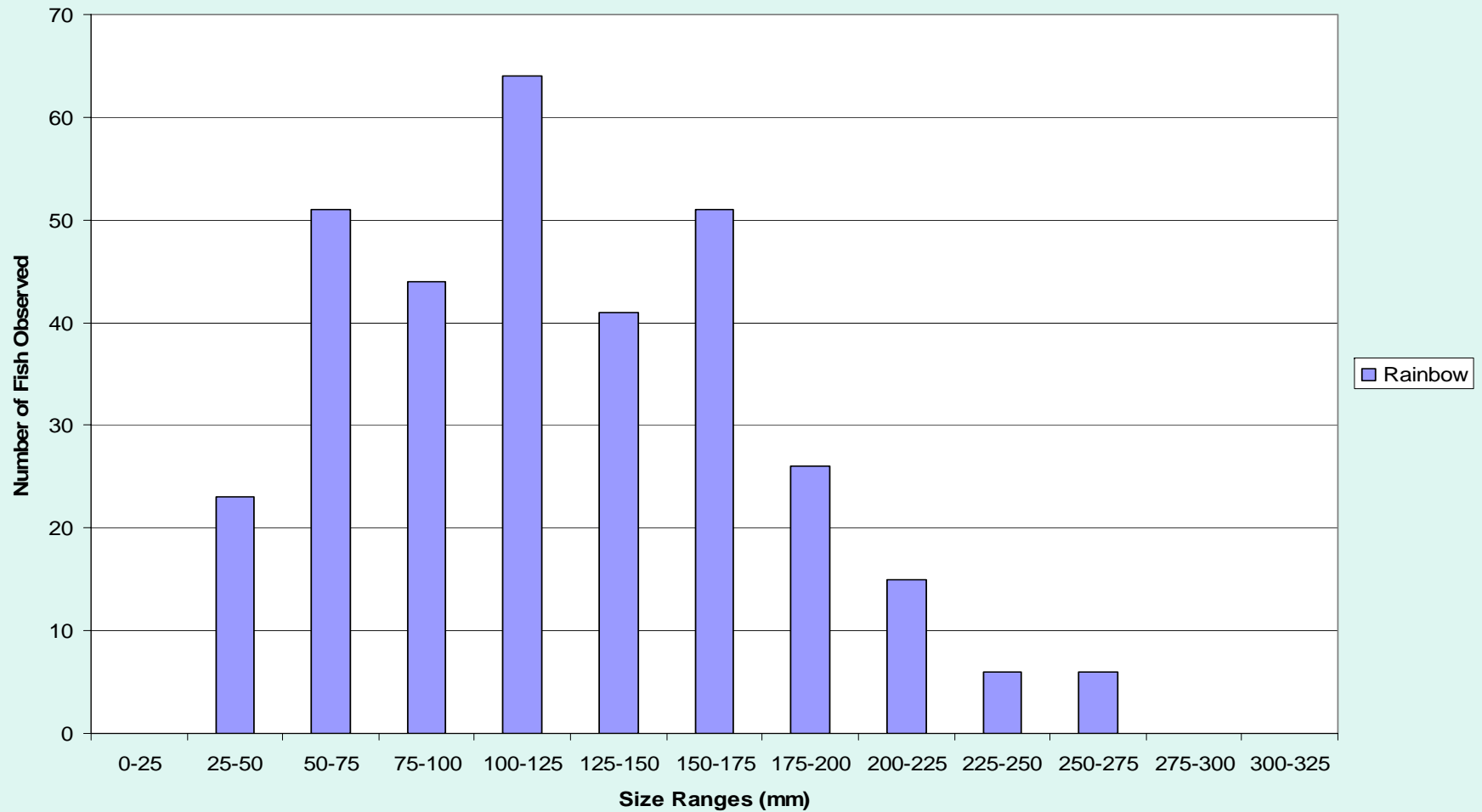
RM 1.0-1.9 (Electrofishing)

Fish Shocking Observations for Lake Creek
(RM 1.0-1.9)



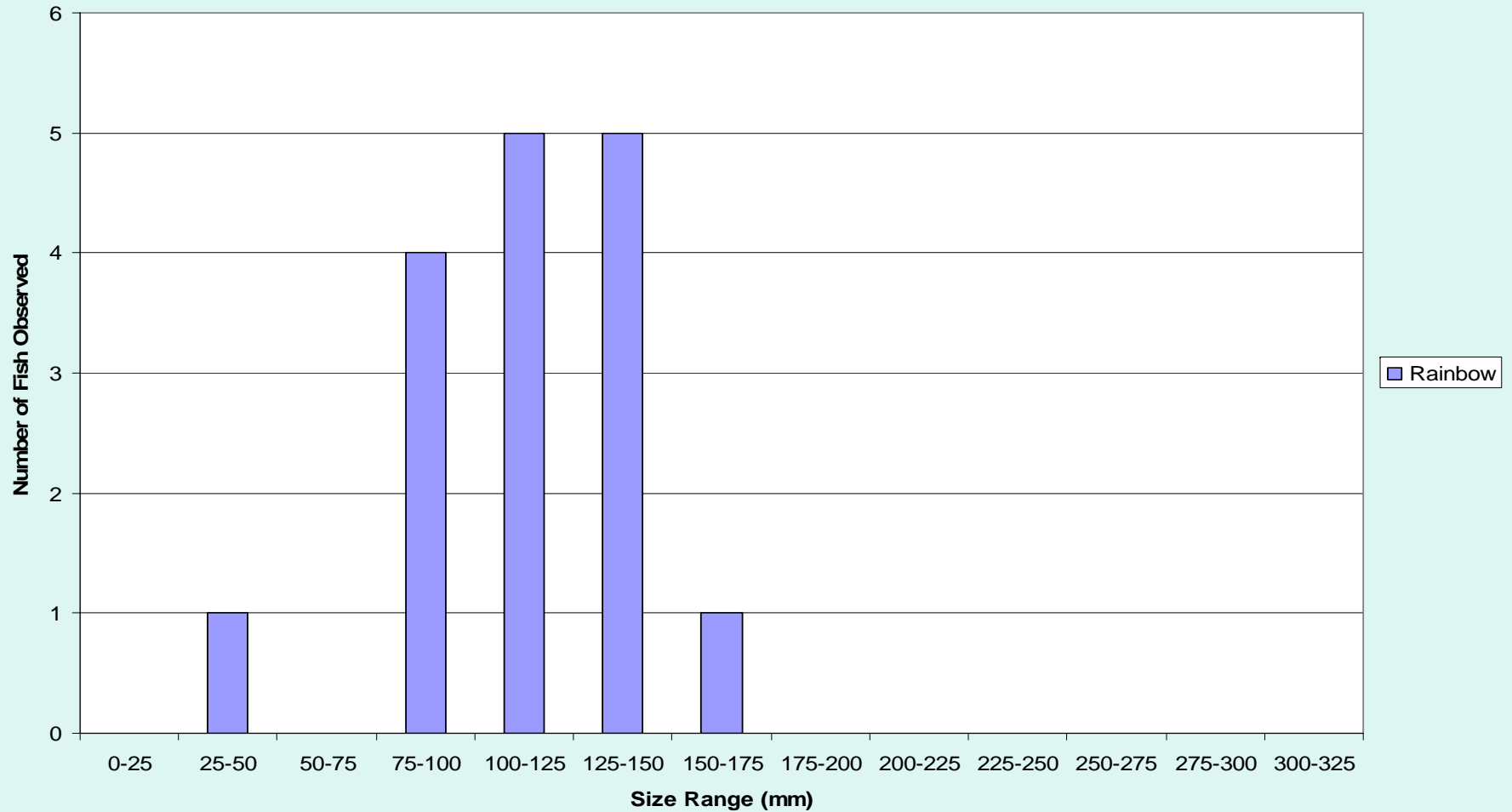
RM 1.9-5.17 (Snorkel)

Fish Snorkeling Observations for Lake Creek
(RM 1.9-5.17)



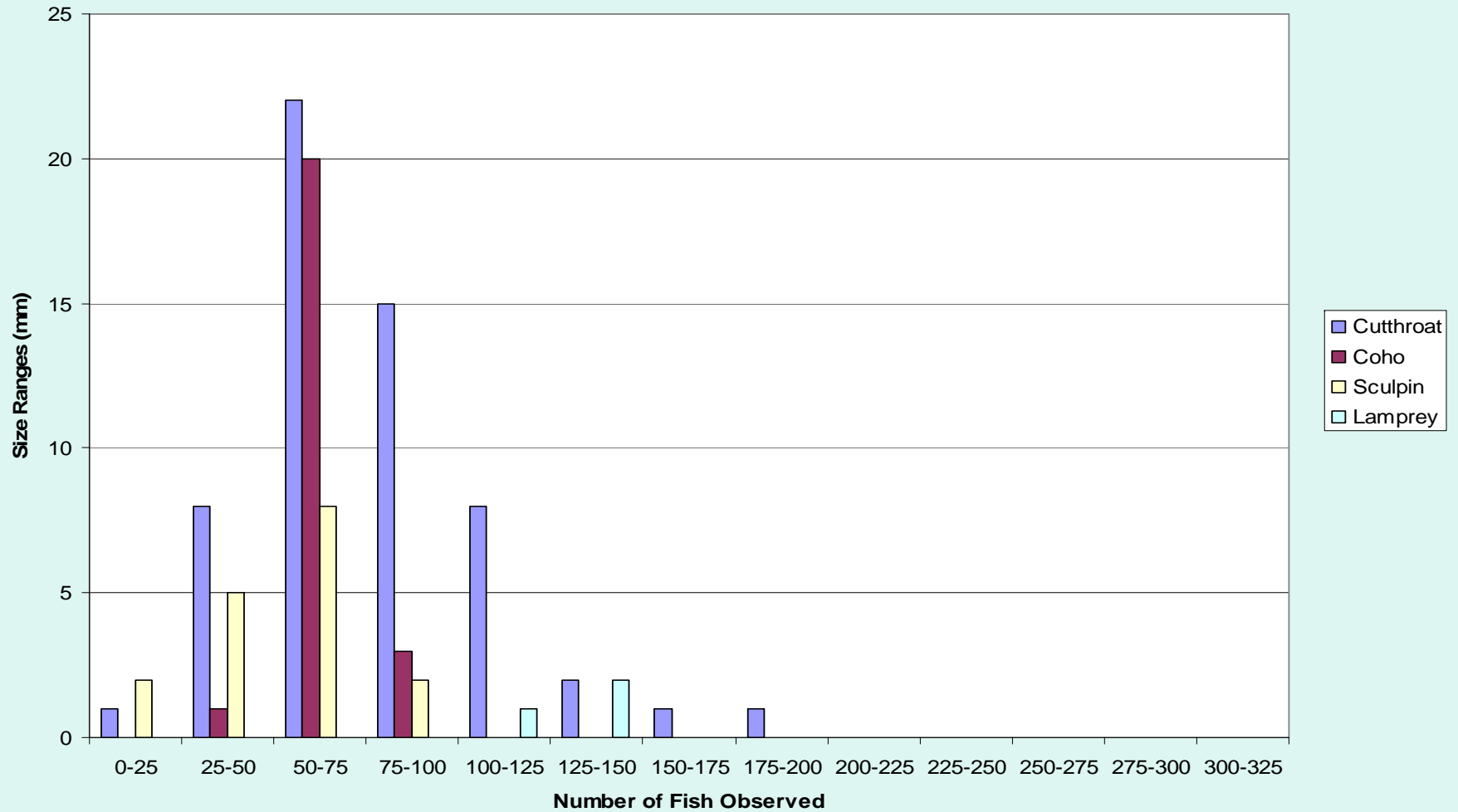
RM 5.17-5.4 (Electrofishing)

Fish Snorkeling Observations for Lake Creek
(RM 5.17-5.4)



Snyder Creek (Electrofishing)

Fish Shocking Observations for Snyder Creek



Resident Spawning Surveys

- Four spawning surveys were done on the tributaries to Packwood Lake. Higher than normal flows and increased turbidity during the historical peak spawning period made surveying during late May and most of June nearly impossible
 - 5/16/06
 - 6/29/06
 - 7/13/06
 - 7/19/06
 - Data has not yet been analyzed to the point of display. Note: Rainbow or their corresponding redds were observed in Crawford Creek, Beaver Bill Creek, Muller Creek and Osprey Creek
- The Anadromous Habitat and Spawning Study Report addresses issues pertaining to anadromous spawning in waters potentially impacted by the Project

Field Work Not Completed

- Packwood Lake tributary spawning surveys (mid-May to late June 2007, depending upon flow conditions)
- Barrier identification on Beaver Bill, upper Lake and Mueller creeks (within the range stipulated in the Study Plan)

Data Analysis and Reporting Not Completed

- Hall Creek data
- Packwood Lake tributaries spawning surveys
- Synthesis documenting similarities and differences between fish above and below the Packwood Lake drop structure
- Draft and Final Reports (Including literature review)