

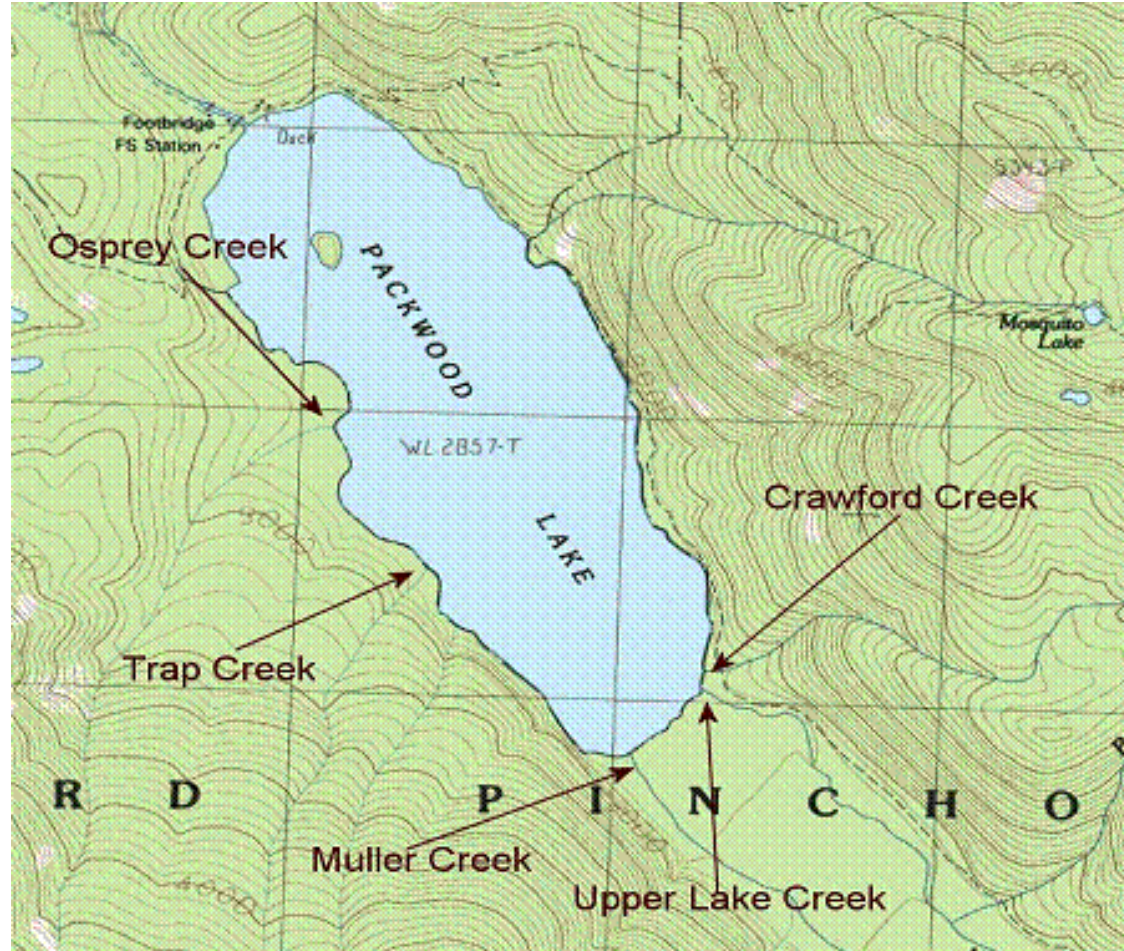
Packwood Lake Outmigration and Hydroacoustics



Rainbow Trout Outmigration

- Six surveys (July 24-August 30)
- Snorkel Surveys and Visual Observations
- Creeks Surveyed
 - Crawford Creek
 - Upper Lake Creek
 - Muller Creek
 - Trap Creek
 - Osprey Creek

Surveyed Tributaries



Days Between the Peak Spawning Survey and Peak Outmigration Survey

Creek	Peak Spawning Survey	Peak Outmigration Day	Days Between	Avg. Water Temp. During Incubation (C)
Crawford	6/11/07	8/9/07	49	9.0
Upper Lake Creek	6/18/07	8/9/07	42	6.0
Muller	6/18/07	8/20/07	53	6.6
Trap	6/6/07	8/2/07	47	9.7
Osprey	6/6/07	8/20/07	65	7.6

Observations

- Approximately 70% of outmigrants were observed in Muller Creek. This is consistent with earlier spawning numbers
- Numbers of fry observed mirrored earlier spawning survey numbers (next page)
- Crawford and Trap creeks were very low during the last two weeks of the survey period
- No fry were observed in the isolated sections of these creeks. Many were seen near the mouths in the lake.

Observations (Cont.)

Total Redds and Fish Observed During Packwood Lake Tributaries Spawning Surveys

Packwood Lake Tributaries Total Redds and Fish Observed (2007)

	Upper Lake	Crawford	Muller	Trap	SE Trap	Osprey
Redds	61	214	1147	38	0	134
% of Total	4	13	72	2	0	8
Fish	112	502	3665	86	0	441
% of Total	2	10	76	2	0	9

Hydroacoustics

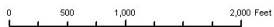
- EN decided to conduct additional analysis related to the rainbow trout population in Packwood Lake
- BioSonics 200 MHz split beam transducer and echosounder
- Series of cross sections analyzed (Littoral, Transition, Deep)
- May 2007, prior to adult migration to tributaries to spawn
- August 2007, after adults had returned to the lake and fry had begun outmigration

May 23rd

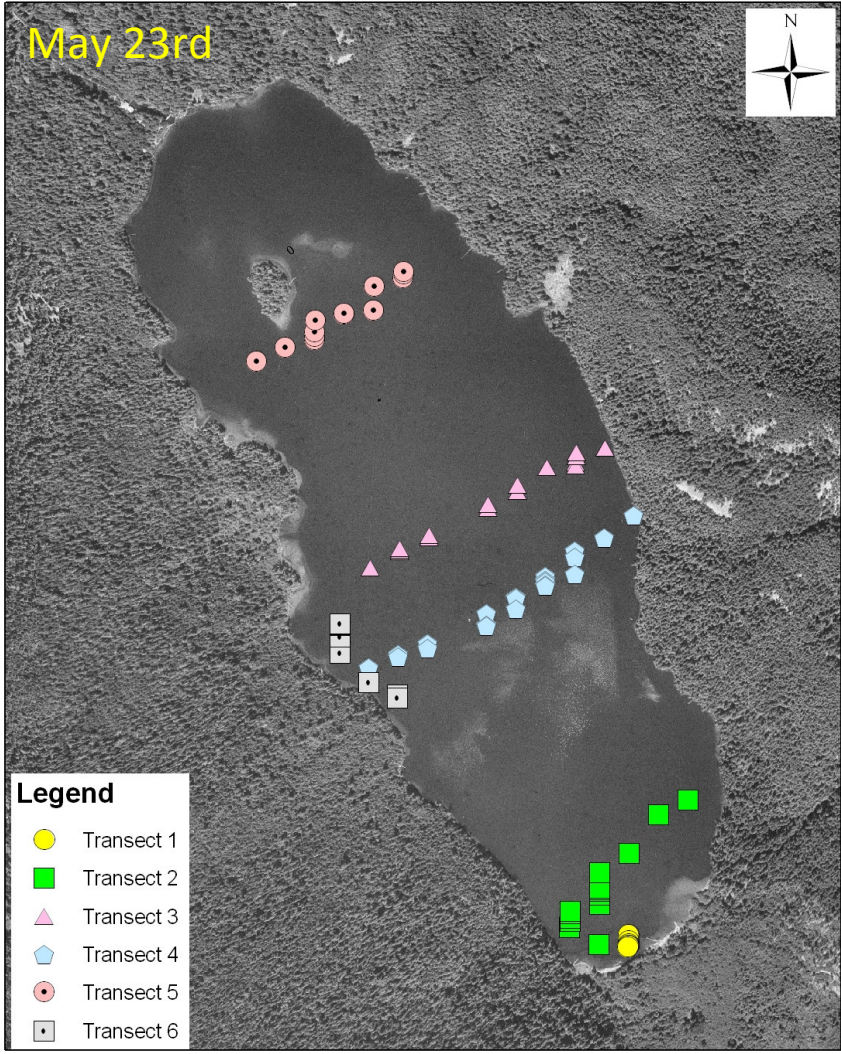


Legend

- Transect 1
- Transect 2
- ▲ Transect 3
- ◆ Transect 4
- Transect 5
- Transect 6



1 inch equals 1,000 feet

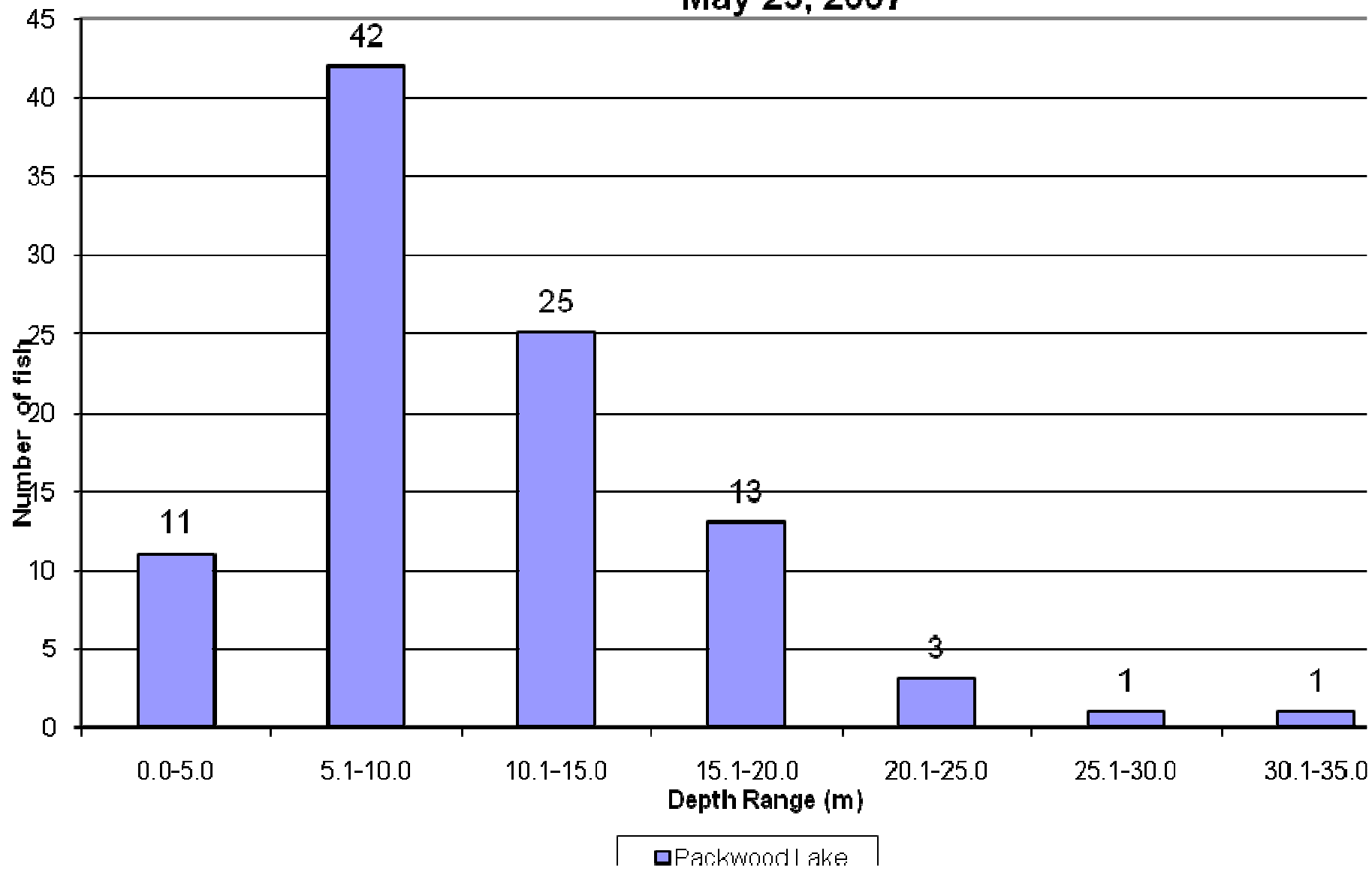


May 23rd Results

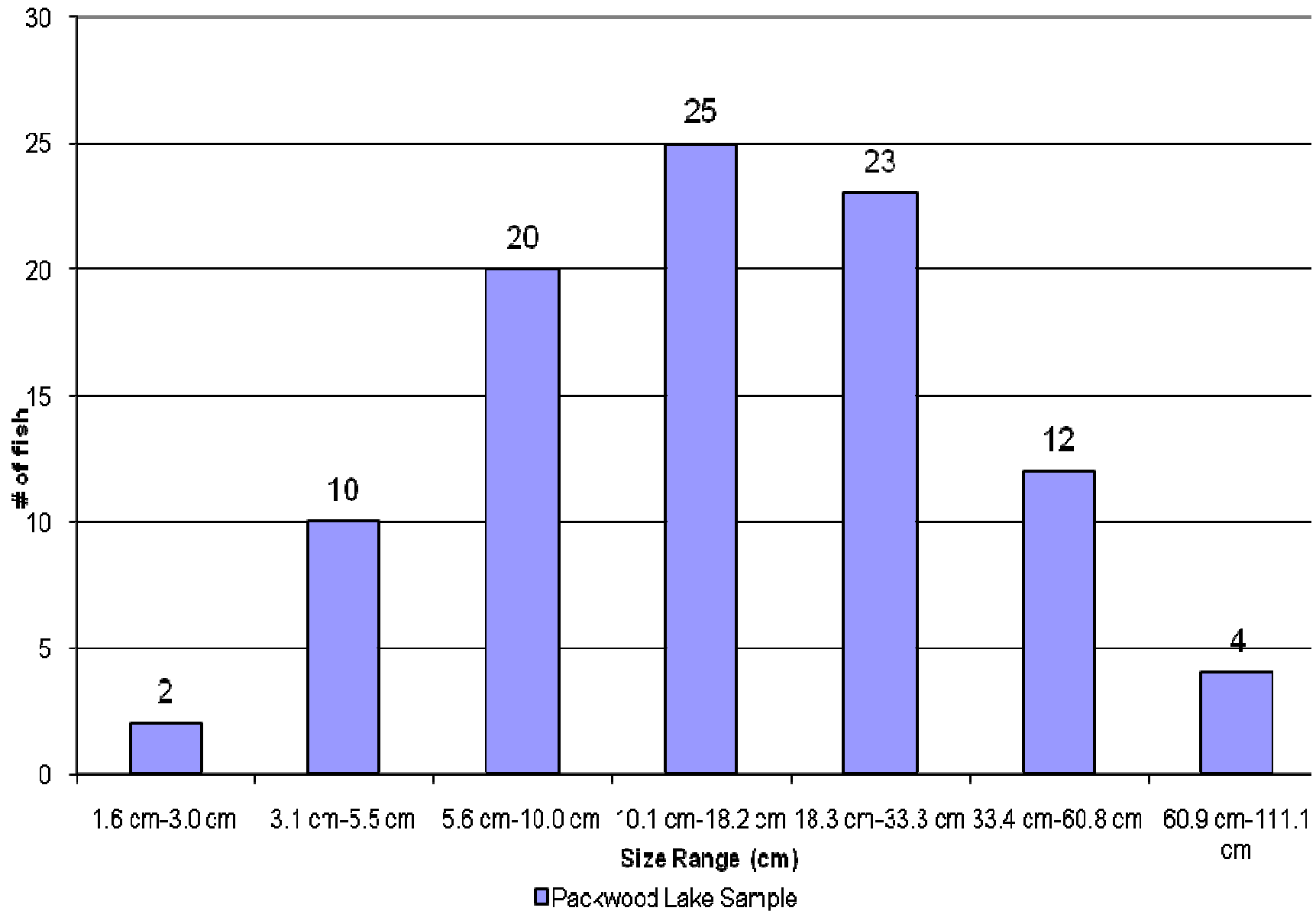
Number of Fish and Associated Depth Ranges for Transects Surveyed in May				
Transect	Location	Number of Fish	(m)	Sample Volume (m ³)
1	Littoral	10	1-10	1194.78
2	Transition	20	4-25	21875.25
3	Deep	22	4-31	57768.88
4	Deep	21	5-18	50405.02
5	Transition	14	5-18	18565.99
6	Littoral	9	4-26	9368.57

Packwood Lake Hydroacoustic Survey Rainbow Trout Depth Distribution

May 23, 2007



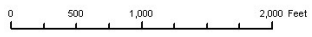
**Packwood Lake Hydroacoustic Survey Rainbow Trout Size Distribution
May 23, 2007**



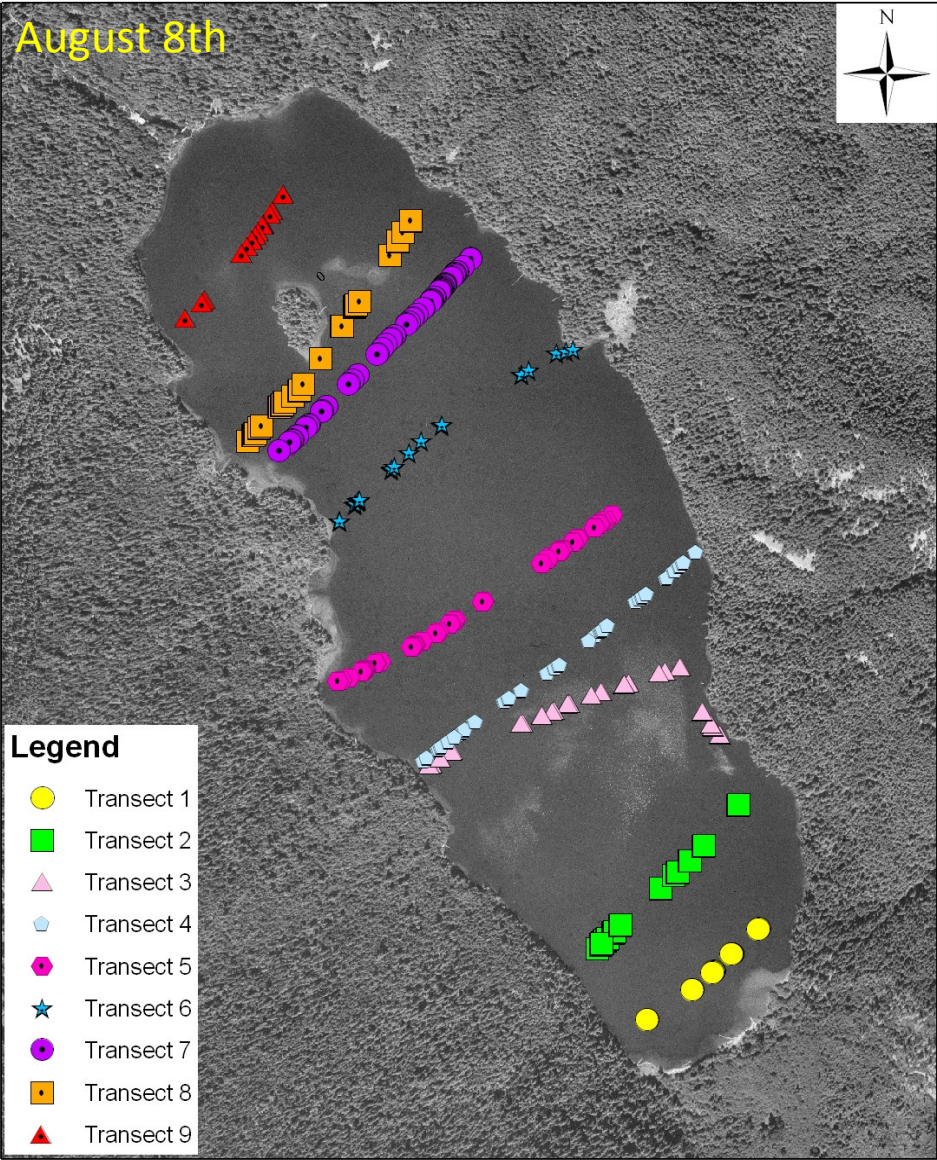
August 8th



- Legend**
- Transect 1
 - Transect 2
 - ▲ Transect 3
 - ◆ Transect 4
 - ◆ Transect 5
 - ★ Transect 6
 - Transect 7
 - Transect 8
 - ▲ Transect 9



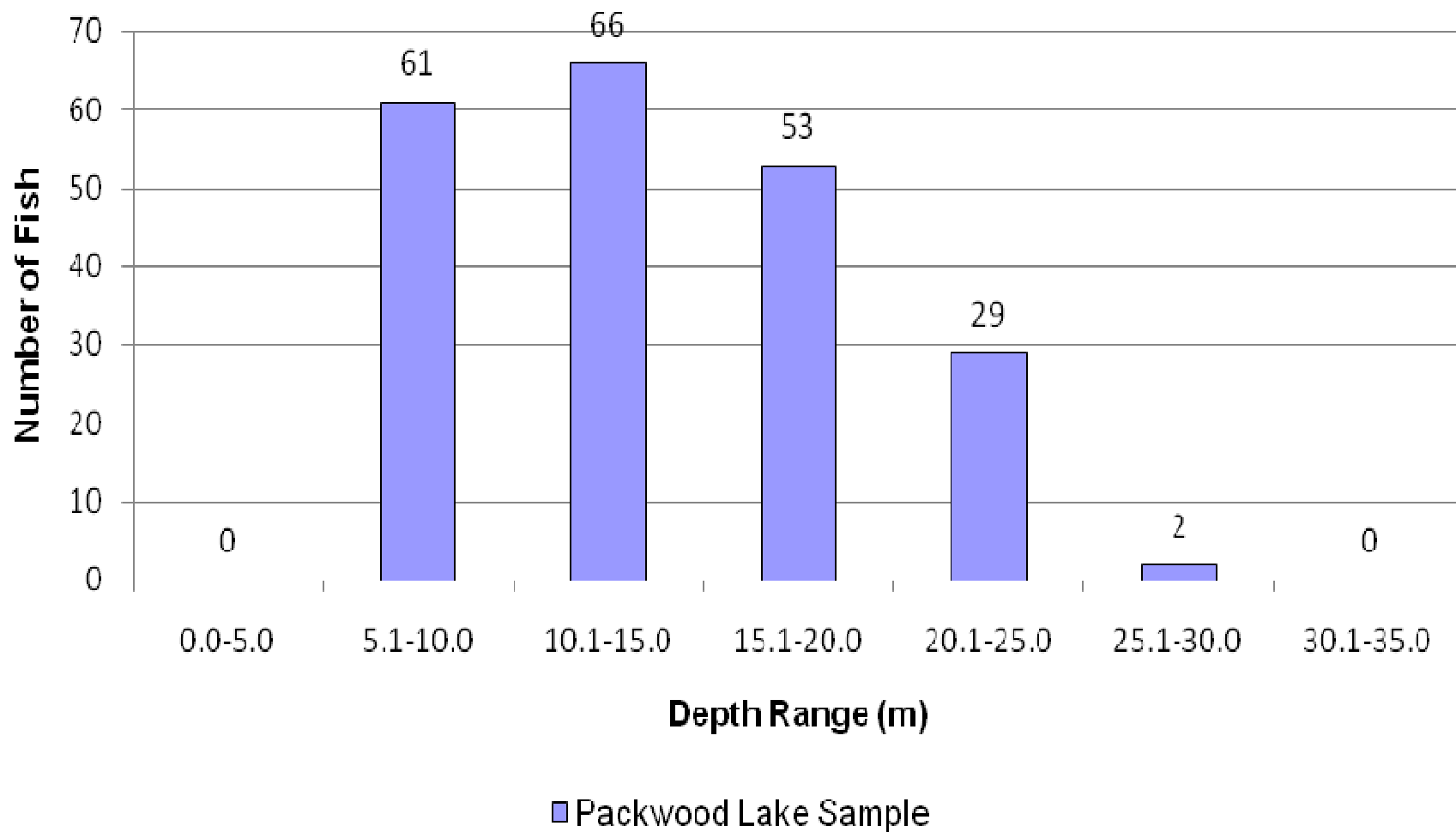
1 inch equals 1,000 feet



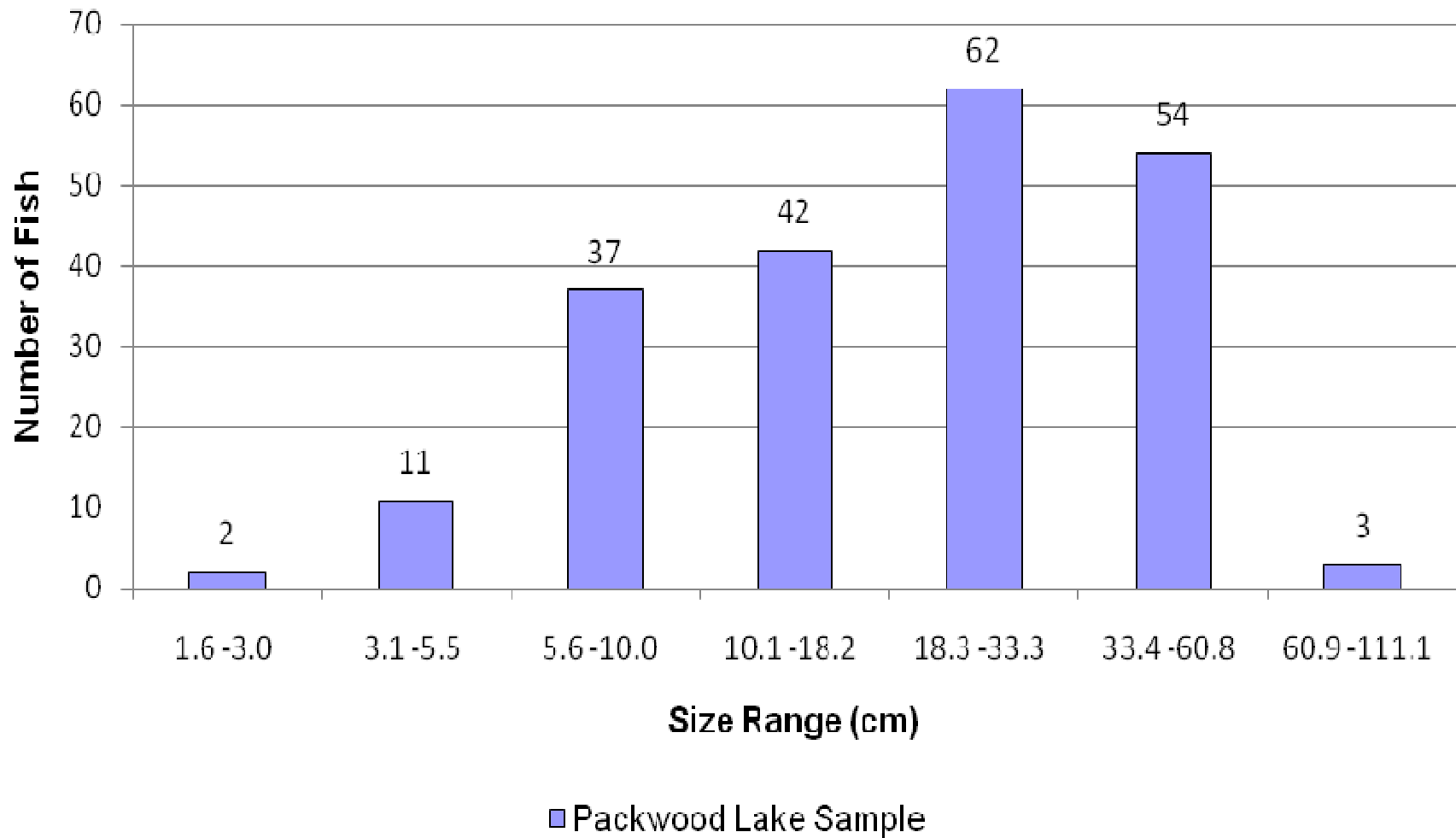
August 8th Results

Numbers and Associated Depths of Fish Observed During the August Hydroacoustic Survey				
Transect	Location	Number of Fish	(m)	Sample Volume (m ³)
1	Littoral	8	8-17	10975.94
2	Transition	18	8-25	26018.41
3	Deep	24	7-23	38285.28
4	Deep	34	7-26	46888.68
5	Deep	32	7-28	58249.25
6	Deep	15	5-19	22462.81
7	Transition	44	8-24	19210.79
8	Littoral	21	7-22	9127.58
9	Littoral	15	8-14	5097.925

Packwood Lake Hydroacoustic Survey Rainbow Trout Depth Distribution August 8, 2007



Packwood Lake Hydroacoustic Survey Rainbow Trout Size Distribution August 8, 2007



Conclusions

- Estimated rainbow trout population
 - 21,127 Rainbow Trout in May 2007
 - 31,278 Rainbow Trout in August 2007
- Reasons for differences in population numbers
 - Juvenile outmigration had begun resulting in increased numbers
 - Added number of transects analyzed during the August survey increased the precision of the estimation

Conclusions (Cont.)

- Depth distributions and the relative number of fish in each 5 meter increment remained relatively constant between the two surveys
- The exception to this was the percentage increase in rainbow trout seen in the 10.1 m to 15.0 m section of the water column in August and the reduction of fish present in the 0.0-5.0 m strata
- The rainbow trout in Packwood Lake tend to primarily occupy the 5.1 m-20.0 m section of the water column pre and post spawn

Packwood Lake Hydroacoustic Survey Rainbow Trout Depth Distribution May vs. August

