# SMITH RIVER DUAL FREQUENCY IDENTIFICATION SONAR PILOT STUDY

Zack Larson and Associates

# **Project Partners**

CDFG Fisheries Restoration Grants Program

- Steelhead Report Card
- County of Del Norte
- Smith River Advisory Council
- Smith River Alliance
- Humboldt State University
- Alexandre EcoDairy Farms
- Sound Metrics Corporation
- Ocean Marine Industries
  <u>Northern California FFF</u>
- Zack Larson & Associates



2008 Smith River DIDSON Workshop

# What is **DIDSON**?

Dual-frequency Identification Sonar (DIDSON) is promising new technology for enumerating anadromous fish in rivers. DIDSON is a multi-beam, high-definition imaging sonar that produces video-like images of fish and can detect fish as far as 80 meters away. DIDSON is generally positioned in the water near the bank to view a cross section of the channel. Fish are imaged and counted as they pass through the sonar beams. Unbiased fish counts and reasonably accurate length measurements can be derived.

The Alaska Department of Fish and Game (ADF&G) has tested DIDSON for counting salmon in rivers and the technology has consistently exceeded their expectations for counting salmon. They also find the technology increases their confidence in overall fish passage numbers, improves their credibility with user groups and ultimately makes fisheries management decisions easier.

## Purpose

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Develop baseline, basin-wide population estimates of adult salmon and steelhead in the Smith River.

Monitor long-term trends of salmon and steelhead abundance in the Smith River.

Complement ongoing fisheries research, restoration and monitoring projects throughout the basin.

# **Project Location**

The Smith River Sonar Station is located 6 river miles from the Pacific Ocean at the Public Boat Launch Facility off Fred Haight Drive near the town of Smith River.





## **DIDSON DATA EXAMPLES**

Three fish observed from 22 meters to 25 meters from shore



## **Sonar Station Operation**

Two Long Range DIDSON units are deployed from both sides of the Smith River 24 hours per day, 7 days per week from October 1 to April 15<sup>th</sup>. Data is recorded in 20 and 30 minute files and processed onsite from a utility building connected to grid power.

# **DIDSON DATA EXAMPLES**

Length measurements of targets can be recorded with the Sound Metrics DIDSON software. The individual fish shown to the right is approximately 3.7 feet or 44 inches in length.



## 2010/2011 DIDSON data vs. Rowdy Creek Fish Hatchery data



# Year 1 PRELIMINARY Results

### **EMPIRICAL DATA**

Total Upstream Detections <u>Total Downstream Detections</u> Net Upstream Detections

**Comments** 25 Oct – 15 Dec: Net Upstream Detections 16 Dec – April 15 Total Upstream Detections 43,479 <u>11,235</u> 32,234

#### 21,958 (Chinook?)

12,475 (Steelhead?)

\*\*OFFICIAL RESULTS FOR THE 2010/2011 WILL BE PROVIDED AT THE END OF THE 2011/2012 SEASON

#### **OTHER INTERESTING RESULTS**

0.7 0.6 PERCENTAGE OF FISH HEADING DOWNSTREAM 0.5 0.4 0.3 0.2 0.1 0 Oct. 25 - Nov. 1 - 7 Nov. 8 - Nov. 16 - Nov. 24 - Dec. 2 - Dec. 10 - Dec. 18 - Dec. 26 - Jan. 3 - Jan. 11 - Jan. 19 - Jan. 27 - Feb. 12 - Feb. 28 - Mar. 8 - Mar. 8 - Mar. 16 - Mar. 24 - Apr. 1 - Apr. 9 -23 Dec. 1 Dec. 9 Dec. 17 Dec. 25 Jan. 2 Jan. 10 Jan. 18 Jan. 26 Feb. 3 Feb. 19 Feb. 27 Mar. 7 Mar. 15 Mar. 23 Mar. 31 Apr. 8 Apr. 15 30 15

#### PERCENTAGE OF FISH HEADING DOWNSTREAM BY DATA COLLECTION WEEK

DATA COLLECTION WEEK



#### TOTAL NUMBER OF FISH OBSERVED PER HOUR DURING THE 2010-2011 SEASON

sectory.



<u>http://www.soundmetrics.com/</u>

<u>http://www.oceanmarineinc.com/</u>

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