

PSC Northern Fund 2014 Project Completion Report

Project Title: Electronic Data Collection from Marine Sport Fisheries in Southeast Alaska

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Identify the one Project Type that best describes the main intent of the proposal.

Check one

Dollar amount requested

Specify currency

Improved information for resource management

\$150,000 US

Habitat restoration

\$

Enhancement

\$

Project Location:

Douglas, AK

Is this proposal a continuation of a project previously funded by the Northern Fund ?

Y / N

This is Year # 1 of 1 years.

Start Date: 01/07/2014

End Date: 31/12/2015

Total PSC Funding Requested:

(Specify currency)

\$150,000 US

Total Other Funding & In-Kind Contributions:

\$119,708 US

Total Project Cost:

\$269,708 US

Summary:

Each year Alaska Department of Fish and Game (ADFG), Division of Sport Fish conducts the Marine Harvest Studies (MHS) Program, which utilizes on-site sampling in ports throughout Southeast Alaska to recover coded wire tags (CWT), collect various biological data from Chinook salmon, as well as information from other salmon and ground fish species. Data collection takes place from the end of April through mid-September in nine ports in Southeast. Funding was provided by the Pacific Salmon Commission, Northern Fund for the purchase of handheld electronic devices, the programming of a mobile application for the collection of marine sport data in Southeast Alaska, and development of the associated databases. This new process would replace the inefficient and dated optical scanning technology utilized by the program. The project was to be completed between 01 July 2014 and 31 December 2015.

Project Budget:

The project was funded for \$150,000 US with a breakout of \$131,578.95 for direct costs and \$18,421.05 for ADF&G indirect costs. A request to modify the breakout of the funding was done on 12 September 2014 and was granted. The initial plan was to fund an in-house ADF&G programmer and to put the majority of the funds into purchasing ruggedized hand held devices. However, based on gathered information and advice from IT staff, the decision was made to contract a firm to do the programming and database development and purchase less expensive handheld devices with waterproof cases. In addition, because money was moved out of line 100, the indirect fees became available for use on the project. The final allocation of funds was broke out as follows: \$137,528 for contractor fees, \$8,862 for hand held devices and accessories, and \$3,038 for travel costs (Table 1).

Table 1 Allocation of award funding

Line	Original Award	Requested Allocation Adjustment (9-12-14)	Final Allocation
100	\$ 28,578.95	\$-	\$-
200	\$3,000.00	\$3,000.00	\$3,038.41
300	\$-	\$103,578.95	\$137,527.97
400	\$100,000.00	\$25,000.00	\$8,861.82
500	\$-		\$-
Total direct	\$131,578.95	\$131,578.95	\$149,429.20
7.5% Admin indirect	\$9,868.42	\$9,868.42	\$-
Divisional Indirect	\$8,552.63	\$8,552.63	\$-
Total indirect	\$18,421.05	\$18,421.05	\$-
Total Amount	\$150,000.00	\$150,000.00	\$149,429.20

Project Schedule:

The project was to be completed between 01 July 2014 and 31 December 2015. The original timeline was approved to be extended to 30 June 2016 so issues that were identified during the 2015 field testing could be addressed during the 2016 season.

Project Deliverables:

The specific objectives of this project include:

1. Purchase and program handheld electronic devices to increase the efficiency, accuracy and effectiveness of the data collected by the Southeast Marine Harvest Studies Program by transitioning to electronic data recording.
2. Develop associated databases.

A contract was awarded to Finsight, LLC to begin on 26 November 2014 with work to be completed on 30 June 2015; this contract was extended to 30 September 2015 to be able to cover the full field season. After the contract was completed there were still issues to resolve so a second contract with Finsight, LLC was created to continue development on the handheld ending 30 June 2016.

The contractors identified the various data collected by the Marine Harvest Studies Program and the current processes utilized to collect and record the harvest, effort and biological data. They also reviewed the RecFin application which was created for the Pacific States Marine Fisheries Council (PSMFC) to collect similar recreational fisheries data in Washington and California to determine if it could work for this program. It was determined that while some of the design features were applicable, it would be more efficient to start with a new design. They also met with ADFG IT staff to ensure all security protocols would be met. Due to security concerns of having multiple iPads connecting with the State network, the decision was made to create a staging database in the cloud to receive transmissions from the multiple devices. The data would then be downloaded to the system of record within the ADFG network. With this information, a requirements document was developed describing the system architecture and functional requirements along with a project plan and development schedule. It outlined the scope and requirements for the development of a mobile data collection system including complete electronic reporting system architecture. A mobile client application would be deployed on tablet computers and a host web application and cloud staging database would receive the transmissions. From the web interface authorized department personnel can download interview, biological and CWT data. The data is structured for incorporation into the MTA lab Oracle CWT database.

Field testing of the application was done in 2015 and we found that collection of data was still more linear in design than we wanted. There was no problem collecting the data from anglers who are rarely interviewed; however, frequently interviewed anglers tended to rapid fire off all of the effort and catch data making it difficult for the technicians to capture the data electronically without asking the angler to repeat a few of the fields. Based on this feedback, the user interface was modified over the winter to try to mitigate these issues prior to the 2016 field season. The nature of the app means it will always be somewhat linear versus paper, where you can record any field in any order, but the modifications have been an improvement. As a bonus, as the 2016 season went on, frequently interviewed anglers became familiar with the process and started to respond in the order that we required the information.

The application has built in validations and will also notify the technician if duplicate numbers are entered for biological data with unique identifiers like CWT strap numbers. For each interview, the technician will ensure all built in validations are addressed. There are additional validations that we would like to implement when funds are available. With time, experience and technician feedback, we will continue to add to the list of improvements required to make the mobile application more efficient and user friendly for data collection.

Devices:

With the help of the contractor, the ADFG IT department, and outside entities doing similar work, we reviewed the many different hand held devices available to use. Initially we planned on using ruggedized hand held devices, but the high cost was prohibitive looking long term with 25-30 technicians. Therefore, we expanded our search looking at more affordable hand held tablets and waterproof, rugged cases. After much discussion and review of the iPad testing done by Washington Dept. of Fish and Game (WDFG),

we decided to go with the Apple iPad Air protected by the Lifeproof Fré case. The cases were outfitted with a floatation device which doubled as a shock absorber, a shoulder and hand strap, and car charger. We utilized grant funding to purchase fourteen 32GB iPad Air tablets with all accessories for the 2015 field testing. After seeing the issues we needed to resolve, we directed the funding for additional devices to programming costs feeling it was more important to have a well written application with fewer devices, then all devices required with a poorly functioning application. An additional 21 devices and accessories were purchased using ADF&G DJ funds for the 2016 season.

These devices have worked well and the cases have provided excellent protection. We did encounter some issues with bright sunlight and rain that we were expecting. Lifeproof has two different cases, the Fré with a screen cover and the Nüüd without a screen cover. As touch screens have become more responsive and moved from resistive to capacitive touchscreens with the ability of multi-touch gesturing, several projects have found that raindrops hitting the screen can act as a finger touch and water puddling in the corners mimic a multi touch gesture. WDFG found that utilizing the Fré case with cover reduced the ability of the rain to act as a finger touch. Unfortunately this extra screen does not allow you to utilize the anti-glare screen covers and can add to the glare from sunlight. Utilizing the Nüüd case allows the use of anti-glare screen covers or the built in anti-glare technology in the newer devices but increases issues with raindrops and water pooling and leaves the screen more vulnerable. Southeast Alaska generally has more rain than sunlight, so we went with the fix for rain and purchased the Fré cases. We were able to lessen the effect of sunlight by modifying to app to a high contrast black and white display and changing the accessibility settings on the iPad to 'Bold'. There were also some visibility issues when using polarized sunglasses, but designing the application to be used in either portrait or landscape mode alleviated these issues.

Travel:

Travel to Anchorage to meet with the Analyst/Programmer was not required; however the travel funds were still used to allow Tersteeg to attend meetings on fisheries data management and handheld development. All of these meetings provided invaluable information from other professionals working on similar projects. On November 18-19, 2014 she attended the Emerging Technologies in Field Data Collection Workshop and visited staff at the PSFMC to review their RecFIN mobile application and discuss their progress. On Aug 17-21, 2015 she attended the American Fisheries Society Annual Meeting in Portland Oregon. The meeting included several sessions covering data management, fisheries database planning, fisheries data exchange standards, and data technology.

Measures of Success:

The purchase and use of the handheld electronic devices was the specific measure of success for this proposal. The overall project will be considered successful when fishery technicians in ports throughout Southeast Alaska can routinely collect sport harvest data using handheld devices and reliably transfer collected data to the database with minimal human intervention. By the end of the 2016 field season, all technicians in three ports (Juneau, Sitka and Petersburg) and two technicians (one in Ketchikan and one in Prince of Wales) moved to collecting data completely on the handheld devices. We are hoping to expand this to more ports and technicians for the 2017 season. So while we have not met the goal of all technicians in all ports utilizing the application, we still feel the project has been successful and will continue to expand the usage of the technology and to refine and improve the application. Specific criteria for success included:

1. No detectable increase in time required for electronic collection of field data.

Once past the initial learning curve this goal was met for several technicians and these samplers preferred handheld collection over paper forms. Technicians not as familiar with technology had a more difficult time with the transition, but this is being addressed through comprehensive training and familiarity with the application.

2. Reduced frequency of errors using electronic data collection over paper-based methods.

When using the handhelds, errors produced from bubbling errors or inaccurate scanning of the paper forms is eliminated and the handheld application has built in validation for several fields which reduces errors at the source.

3. Reduced frequency of irresolvable data issues over paper-based methods.

By technicians receiving validation feedback sooner, either via the application or earlier notification from the office, the frequency of these errors has been reduced. Work still needs to be done to create more real time validations.

4. Transmission of data from field devices to central databases that is reliable, fast, cost-effective, and rarely requires assistance or technical support from IT staff.

During the 2015 and 2016 field seasons, we addressed several errors that affected the transmission of data and worked with backup procedures if a transmission did fail. The process is now smoother, more reliable, and does not require as much technical assistance.

5. Reduction in time spent by staff and technicians processing and editing data.

Time spent by staff has been reduced as there are no bubble forms to review for completion, to optically scan, then review for scanner errors or additional errors missed in the first review. The data is imported in a csv file which is easy to review, filter, and pivot to check for errors.



Figure 1 iPad Air in waterproof case with floatation device and straps.



Figure 2 Juneau technician interviewing a sport fishing angler utilizing the handheld device.

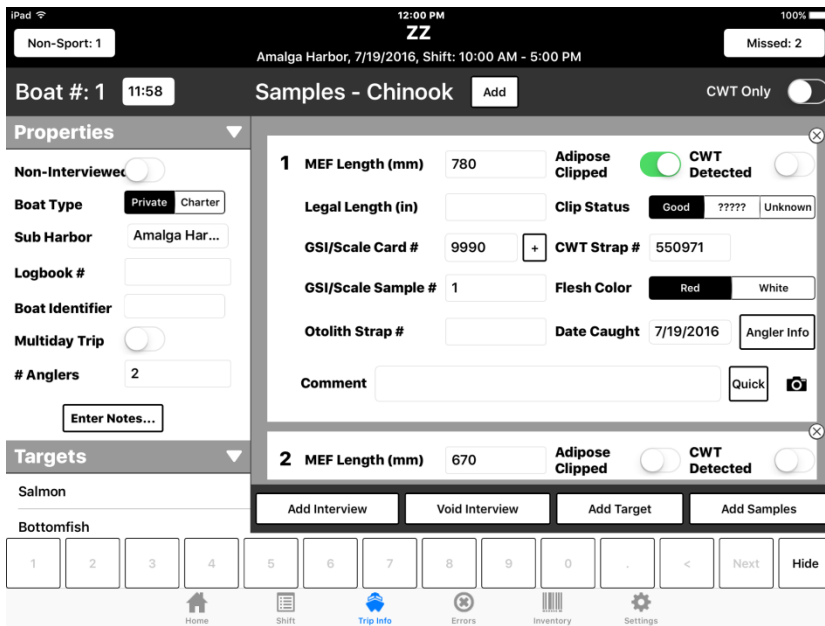


Figure 3 Screen shot of application capturing biological and CWT data for Chinook salmon