


CS486C – Senior Capstone Design in Computer Science

Project Description

Project Title: “FISH” – Fish Identification Search History- Mobile Application	
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Project Overview:

The Arizona Game and Fish Department (AZGFD) is responsible for managing fish in the state of Arizona. One of the premier rainbow trout fisheries in the region is in the cold tailwaters below Glen Canyon Dam; this 15 mi reach is commonly referred to as the Lees Ferry fishery. AZGFD and the Grand Canyon Research and Monitoring Center (GCMRC) – USGS have been monitoring and conducting research on the rainbow trout (Fig. 1) in this reach for over 30 years. To manage the fishery and better understand how dam operations affect the fishery, researchers have been implanting passive integrated transponders (PIT) tags in fish since 2011



Fig. 1. Rainbow trout at Lees Ferry

(Fig. 2). These are the same tags pet owners often use, and provide a unique identifying number for each fish tagged. In 2020 we tagged 9,803 rainbow trout, and 2,539 brown trout. From 2011 to 2020, a total of 113,218 rainbow trout and 6,263 brown trout have been tagged. With information from these tags and a mark-recapture sampling program we can examine growth rates, movement, survival, and estimate population size. Scientists can only sample a portion of the river and only 3-4 times per year. Guides and anglers are fishing every day and could provide valuable data on the fish that they

capture that would help us manage the fishery.

AZGFD oversees a citizen science program of interested anglers and guides who provide us with information on the species and size of the fish they capture. However, we have had limited success in enrolling more than a handful of anglers. To increase angler engagement and participation in the citizen science program we would like to provide anglers with information on individual fish that they catch. When was it last caught, where was it caught, how big was it, and how much did it grow during that time? Anglers could then provide an update to the

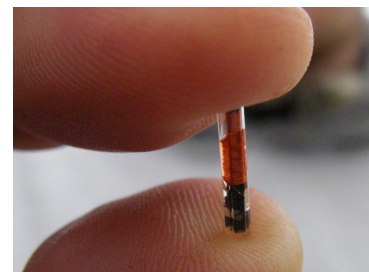


Fig. 2. Passive integrated transponder (PIT) tag

- Have the ability to add information (data) on the fish carrying that tag (date, length, weight, species)
- Ability to upload data to database in the cloud
- Ability to update portable fish database

Impact of a successful solution

While the development of an application would help manage the Lees Ferry fishery, this application could also be used by others that utilize a mark recapture program and PIT tags in their research. There are multiple mark-recapture programs around the country and the world that would benefit from the development of this application.

Knowledge, skills, and expertise required for this project:

- Cross platform (Android/IOS) mobile application development
- Effective implementation of user-friendly and engaging (G)UI to make operation as easy and expedient as possible
- Offline and online mobile application and database communication and operation
- Bluetooth communication

Equipment Requirements:

- PIT tag scanner and sample PIT tags will be provided
- There should be no other equipment or software required other than a development platform and software/tools freely available online

Software and other Deliverables:

- A strong as-built report detailing the design and implementation of the product in a complete, clear and professional manner. This document should provide a strong basis for future development of the product.
- Complete professionally-documented codebase, delivered both as a repository in GitHub, or some other version control repository; and as a physical archive on a USB drive.