

Shark Bytes

The Team

Jered Angous, Daniel Arden, Alex King, Anthony Narvaez



Team Shark Bytes

**Colorado River Area Biologists Computer Aided Knowledge Entry System
(CRAB CAKES)**

Team Mentor: Scott LaRocca

Intro

We are working with multiple agencies, The Arizona Game and Fish Department, U.S. Geological Survey, and U.S. Fish and Wildlife Service

Clients: David Rogowski (AGFD), Maria Dzul (USGS), Pilar Rinker (USFWS)



USGS



Problem Statement

Monitoring efforts are crucial for protecting the wildlife around the Colorado River and supporting the more than 40 million people that depend on those resources.

⇒ Our clients are at the frontlines of this endeavor.

Current Workflow:



Catch fish from the Colorado River



Scan/Tag Fish and measure new data



Record data using SHOALS, and upload to Database



Pain Points & Value Proposition

Despite its central role in data collection, SHOALS' limitations slow down fieldwork and increasingly risk the accuracy of collected data. These include problems like:



SHOALS is outdated and the developer retired over 6 years ago.



Inaccurate alerts lead to underestimating specimen proportions



Lack of documentation hinders maintenance & improvement efforts



Visual Basic makes maintaining SHOALS difficult



Our team is creating a more flexible and modern data entry system that can serve as a maintainable and well-documented replacement to the aging SHOALS program and that will empower researchers to focus on the work that actually matters.

Solution Overview

- A customizable set of fields so users can adapt it to their use case.
- A robust backup system that saves to local storage and multiple USB drives.
- Bluetooth compatibility with PIT Tag Readers.
- A modernized UI
- Quality of life updates

Workflow

User scans fish for PIT Tag

User enters data into active study's field

Program compares entered information to historical entries, alerts user of data mismatch if exists

User corrects entered data

Program saves entry into database

User finishes entry, clicks "Save record" button.

Program backs up data to external drive

At end of trip, data is exported to .TSV, and imported into main database.

Key Requirements



Data entry system

- Customizable fields
- Field constraints and data type verification
- Error checking
- Export data to file



Backup system

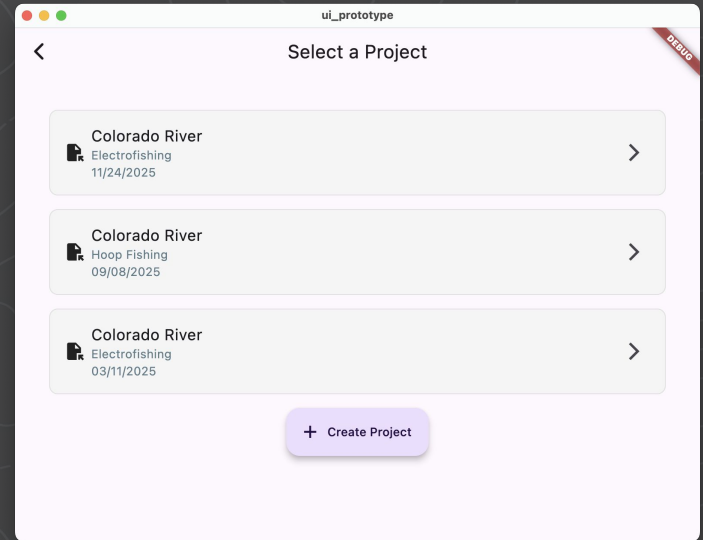
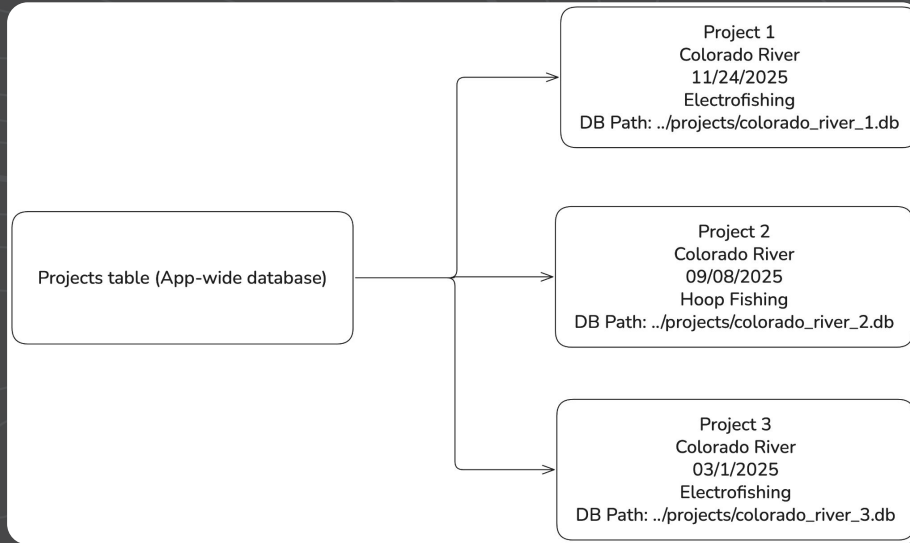
- Initiate backup upon each new entry
- Backup to local storage
- Backup to multiple external drive simultaneously



Bluetooth Compatibility

- Establish a reliable connection to the PIT scanners
- Retrieve and store scanned PIT tag data

Key Feature: Project Selection



Risk / Feasibility

Risk:

- Data loss
- Data corruption
- Data misentry



Research trips are costly and data informs conservation and policy decisions. Data loss or inaccuracy can have significant consequences.

To mitigate this, we will use SQLite for its constraints system and ACID compliance, alongside adding our own constraints logic.

Feasibility



Bluetooth:
PIT tag reader support



Flutter:
Application framework



SQLite:
Local data storage

Schedule

- We completed all the tasks up to week 13
- Currently working on prototyping and testing
- In the future we plan on completing the development, testing, and deployment of application
- Overall, we are on track with the schedule

		Week 1-6	Week 7-10	Week 11-14	Week 15-16	Week 17-24	Week 25-30	Week 31-32
1	Team Start up and Standards Definition	█						
2	Requirements Acquisition & Feasibility Analysis		█					
3	Design Review and Technical Demonstration			█				
4	Prototyping		█	█	█			
5	Development					█		
6	In-Field Testing						█	
7	Feedback Analysis and Redesign						█	
8	Product Finalization							█
9	Application Deployment and Presentation							█

Conclusion

- Problem: outdated system and inefficient data entry workflow
- Solution: modern and flexible system tailored to the clients needs
- Our team is fully committed to delivering a successful final product



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Questions
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