

Proposal for Funding made to:
Coordinating Council and the Operations Committee
Atlantic Coastal Cooperative Statistics Program
1050 N. Highland St., Ste. 200 A-N
Arlington, VA 22201

Enhancing and modernizing recreational fisheries data collection through crowd-sourced citizen science, remote sensing and emerging AI technology via the GotOne fishing app

Submitted by:

Anthony Wood, Ph.D.
Northeast Fisheries Science Center
Resource Evaluation and Assessment Division
Population Dynamics

Office: (401) 954-1563
Email: anthony.wood@noaa.gov

Proposal for ACCSP Funding

Applicant Name: Anthony Wood
NOAA's Northeast Fisheries Science Center
American Saltwater Guides Association (ASGA) / GotOne Media

Project Title: Enhancing and modernizing recreational fisheries data collection through crowd-sourced citizen science, remote sensing and emerging AI technology via the GotOne fishing app

Project Type: New Project

Requested Award Amount: \$200,000

Primary Program Priority: Biological Module (50%); Recreational Catch and Effort Module (discards) (50%)

Date Submitted: June 17, 2024

Project Supervisor: Luyen Chou (GotOne Media)

Principal Investigator: Anthony Wood

Project Staff: Tony Friedrich & Cody Rubner (ASGA)
Luyen Chou, Tom Fuda, Dirk Liebich (GotOne Media)
Kate Wilke & Brendan Runde (The Nature Conservancy)

Introduction:

We stand at the convergence of two transformative trends: seismic advances in multimodal AI technology and the rapid adoption of mobile apps by recreational anglers. This presents a unique opportunity to revolutionize fisheries management and science by **leveraging cutting-edge AI models and crowd-sourced data from angler apps to fill in key gaps in our understanding of coastal fisheries and stocks.**

GotOne, a new recreational angler fishing log app, launched at the beginning of 2023, has gained the support of leading organizations including the American Saltwater Guides Association (ASGA) and The Nature Conservancy (TNC). Moreover, **GotOne** has been adopted by top professional guides and tackle innovators, such as Hogy Lures and Hatch Outdoors, because it **harnesses these emerging technology innovations to improve anglers' experiences and expertise while also contributing to research needed to support sustainable marine resources.**

The app is gaining significant usership (11,000 logged fish by 2,500 anglers since inception in 2023), and we expect it to continue to grow. **One reason GotOne has established a strong and growing user base is the formation of partnerships with the Atlantic States Marine Fisheries Commission (ASMFC), Louisiana Department of Wildlife and Fish (LDWF), Massachusetts Division of Marine Fisheries (MA DMF), to fill targeted data gaps.** As such, **we believe it is critical that GotOne adopt ACCSP data standards, and implement a standardized approach via the ACCSP data warehouse to share angler data efficiently and effectively with ACCSP partner organizations.** By doing so, we also see an opportunity to promote the participation and compliance of other consumer fishing apps to similarly align their data strategies with ACCSP.

In addition, given the amount of discard length (and other) data currently being collected by GotOne's rapidly growing user base, there is an opportunity to contribute significantly to gaps in recreational fishing data.

Specifically, this project will support ACCSP Program Goals, as well as priorities set forth by the Recreational Technical committee, by improving biological data and discard data for all recreationally targeted Program Priority Species (see Fig. 1 below), plus NOAA Northeast Fisheries Science Center (NEFSC) priority species bluefish, scup, and winter flounder. Black sea bass will be included as well, which is a priority for both the Program and NOAA, and has been suffering from data and management challenges. This project proposes innovative fisheries-dependent data collection and management technology in partnership with NOAA Fisheries, leveraging ongoing partnerships with ASMFC, LDWF, MA DMF, NEFSC, **SEFSC**, University of Chicago's Marine Biological Lab at Woods Hole, among others.

Finally, the **participation of ASGA and TNC in the proposed project provides unique advocacy, outreach, and marketing capabilities and connections across key stakeholder communities,** including scientists, for-hire charter captains, tackle manufacturers and retailers, and the broader recreational fishing community. We believe **leveraging these capabilities and connections can drive high levels of engagement and participation in angler collection of biological and discard data to supplement and enhance current data collection methods.**

Objectives:

- **Augment the collection of recreational fisheries data through recreational angler use of the GotOne fishing app by increasing the number of anglers reporting (sample size) on priority species and increasing geographic scope of data collected.**
- **Align GotOne's fishing data with ACCSP data definitions and standards.**
- **Implement and maintain a regular data feed of fishing data collected from GotOne's users (coastal recreational anglers and professional charter captains) into the ACCSP data warehouse.**
- **Promote the importance of data standardization and integration, as well as promote broader compliance with ACCSP data standards in the recreational fishing app market.**
- **Expand species-specific recreational discard data collection for recreationally-targeted species named in the Priority Matrix, plus NEFSC priority species, including black sea bass, bluefish, scup and winter flounder (Fig. 1).**
- **Implement AI-powered species and length determination capabilities in GotOne to improve and verify data accuracy while increasing angler participation in data capture.**
- **Define species-specific, common protocols and image-based AI training models for individual fish identification, allowing GotOne to serve as a high-tech, low-cost, low-impact fish "tagging" tool to greatly increase the tracking of individual fish within defined stocks.**
- **Enable NOAA to accomplish their goal of "Re-envisioning the Recreational Fisheries Data Partnership" by providing cutting edge technology to better manage our shared marine resources.**
- **Be a partner in restoring faith in fisheries science and management, provide a path forward from MRIP, and support advancements in the NOAA Fishing Effort Survey.**

Need:

Fisheries management has long struggled with challenges related to accurate and timely data collection necessary for stock models to support fisheries policy decisions. The challenge is greater for stocks with a significant recreational component because of the large number of anglers, variety of access points, and lack of reporting requirements for both catch and discards. Specific challenges this project will address are:

- **Filling key data gaps related to recreational discards, including fish length, seasonality, and environmental covariates. Stock assessments regularly list discard lengths as an area for improvement across many economically important species.** Emerging technology can address these concerns and advance our understanding of fisheries impacts on stocks.
- **Recreational data collection has been a source of frustration within the community. We have a tremendous opportunity to reshape the fisheries landscape by enhancing the current system based on the needs of scientists, managers, and the general angling community.** GotOne addresses these needs by leveraging the participation of recreational anglers, who are motivated to log their fishing activities for personal improvement rather than regulatory compliance, to provide a growing abundance of data that can be shared by researchers and managers.

Consumer recreational fishing apps like GotOne provide an opportunity for large-volume collection of catch-related data “in real time” and not reliant upon memory. Emerging data and AI capabilities, such as GPS-specific location gathering, time and location-based environmental data gathering via recognized application program interfaces (APIs), and AI length and species determination through catch photography allow for a rich, and potentially more accurate capture of data that minimizes human error associated with species recognition and recall bias.

However, app-based data collection has its own limitations that have yet to be addressed:

- Inconsistent data standards and definitions (e.g. length, disposition, mode)
- Inherent biases related to factors such as user avidity, regional distribution, etc.

As such, the authors of this proposal do not propose app-based data collection as a substitute for current, official data collection methodologies (e.g., MRIP/APAIS). Instead, **the intention of the proposal is to make recreational angler data collection through apps like GotOne more useful to the management community by committing to alignment of data standards and definitions with ACCSP, and regular data feeds into the ACCSP data warehouse, and by creating validation methods (AI length and species identification)**. By doing so, we hope to create the opportunity to compare data sourced from different apps and from more traditional surveys, to better identify management applications for app-based data, and to fill in gaps in current data collection.

An example of the value of this combined approach is the Massachusetts Division of Marine Fisheries [Striped Bass Citizen Science Project](#), which uses GotOne to efficiently collect striped bass recreational discard data that includes landing time, release time, water temperature, gear type, and fish vitality. As a result of high levels of participation (over 11,000 recorded catches), significant correlations can be made between these factors and catch-and-release vitality, which is already influencing recreational angler behavior, and driving changes in fishing gear design by industry leaders like Hogy Lure Company.

Results and Benefits:

This project addresses program priorities related to Catch and Effort and Biological Sampling of recreationally targeted species ranked in top 25% of the Priority Matrix.

- **Data Collection:** Leverage the GotOne fishing app to collect large volumes of data on recreational **catch and** discards, including additional information such as fish length, condition, release time, and more
- **Data Protection:** Ensure the privacy of GotOne’s anglers by establishing user consent, aggregating and anonymizing user-collected data, and generalizing specific location information
- **Data Sharing:** Standardize and automate regular transfers of discard data to ACCSP data warehouse, which can then be used as a central repository for ACCSP Program Partner access
- **Scientific Advancements:** Provide critical data to **fill gaps in current scientific knowledge, improving stock assessments** and management practices

- **AI Integration:** Enhance data accuracy and utility through AI features like automated species identification and length measurement
- **Data Standards and Integration:** Integrate with ACCSP standards, leveraging SciFish API, while providing a path forward and template for other technologies to comply with shared data

Approach:

The proposed project consists of four discrete, but related, components aligned with the objectives listed above:

1. **Integrate GotOne's data into the ACCSP:**
 - a. Work with ACCSP to review GotOne and ACCSP data definitions, and align GotOne's data definitions and database accordingly. We will also work with existing research partners (e.g. LDWF) to ensure alignment between data collected on their behalf by GotOne with ACCSP data definition and architecture. For instance, this may entail modifying or clarifying the specific definition and format of "length" as reflected in GotOne's existing partners' surveys with the ACCSP standard.
 - b. Work with ACCSP to design and implement an ETL (Extract, Translate, Load) process to transfer data from GotOne to the ACCSP data warehouse for broader access to ACCSP Partners. We recognize that ACCSP may require further data cleansing and validation before making this data more widely available, but the goal is to make GotOne's data available to ACCSP for research and analysis, and as a standardized method for data sharing with GotOne research partners, in lieu of direct data transfers. The approach will leverage existing SciFish platform APIs and other best practice ACCSP data tools and approaches for this integration. We plan to complete the SciFish pre-application for the October 2024 deadline.
2. **Collect and deliver species-specific discard length data via ACCSP to support stock management:**
 - a. Currently, GotOne shares species-specific recreational discard data (including length) directly with management agencies, such as NOAA, MA DMF, ASMFC and LDWF (typically via CSV or JSON files). This proposed project component would build on the work in Component 1 above to reroute these data transfers through the ACCSP data warehouse, thereby also allowing broader access for ACCSP's Partners to discard data from GotOne's users.
 - b. The project would also expand the number of species for which GotOne is collecting and sharing discard length data to include all recreationally targeted fish from the Biological Sampling Priority Matrix, as well as scup and winter flounder, which are priorities for NOAA Northeast Fisheries Science Center (NEFSC). We believe this enhancement can result in a material increase in discard length data available to scientists and managers, a major gap in current stock assessment data. For context, NOAA Fisheries currently collects roughly 40 bluefish discard lengths per

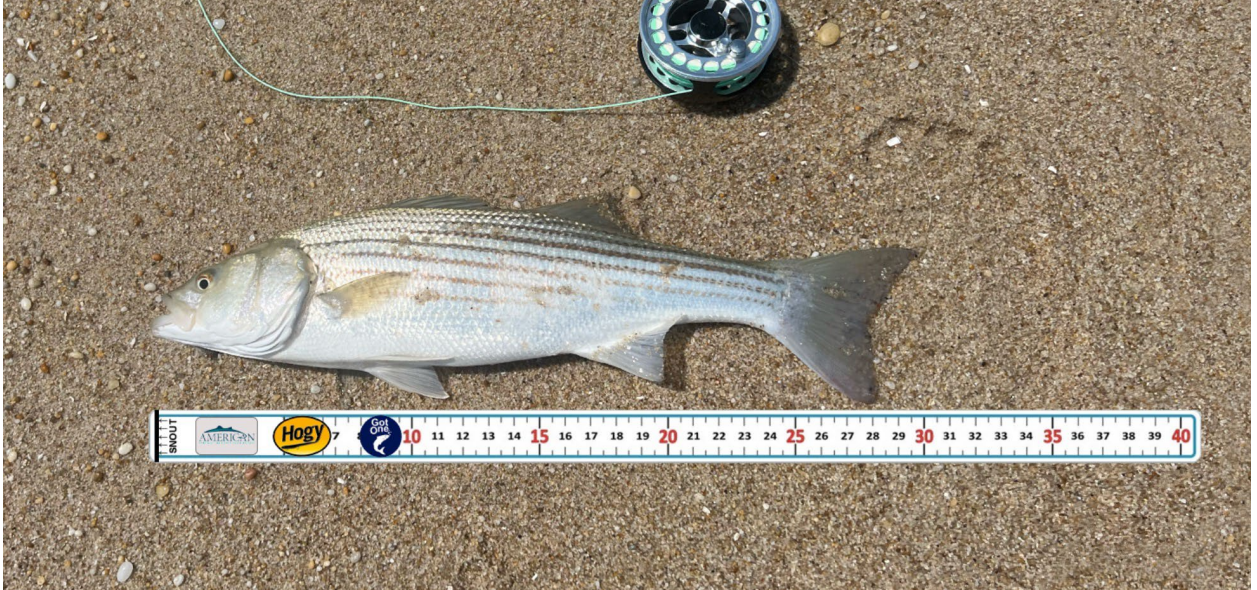
year. Last season alone, GotOne collected over 800 bluefish discard lengths from recreational anglers.

Figure 1.  of species to be added to GotOne:

Biological sampling priority matrix	Priority species currently supported by GotOne	Priority species to be added to GotOne	Species currently supported by GotOne	Additional species to be added to GotOne
Black Sea Bass	Black Sea Bass		Albacore (longfin)	Scup
Red Grouper		Red Grouper	Atlantic bonito	Winter flounder
Tilefish		Tilefish	Bigeye tuna	
Snowy Grouper		Snowy Grouper	Black drum	
American Shad		American Shad	Black sea bass	
Atlantic Menhaden			Blackfin tuna	
River Herring	Cobia		Bluefin tuna	
Spanish Mackerel		Spanish Mackerel	Bluefish	
Atlantic Halibut			Bonefish	
Blueline Tilefish		Blueline Tilefish	Cobia	
Finetooth Shark			False albacore (little tunny)	
Gray trigger		Gray trigger	Fluke (summer flounder)	
Bluefin Tuna	Bluefin Tuna		Jack crevalle	
Gag grouper		Gag grouper	Mahi-mahi	
Vermillion Snapper		Vermillion Snapper	Permit	
American Lobster			Red drum (redfish)	
Spiny Dogfish			Sheepshead	
Red Snapper		Red Snapper	Skipjack tuna	
American Eel			Skunk	
Sortfin Mako Shark			Snook	
			Speckled trout	
			Striped bass (rockfish)	
			Tarpon	
			Tautog (blackfish)	
			Weakfish (squeteague)	
			Yellowfin tuna	

3. Train AI model for accurate discard length measurements from photographic input, and create common protocol for image capture for training AI models for future capabilities:

Recent frontier AI models have been trained to “understand” visual inputs with astonishing sophistication. If you upload a photo of a landscape, these models can now identify humans, distinguish them from animals and trees, and even identify the flora and time of year. This capability is the result of training AI vision models against vast databases of visual content, accompanied by descriptions and metadata, typically added by humans. Based on similar approaches, fishing app developers and AI researchers have made significant progress on reliable identification of fish species from web-sourced angler photos. Progress has also been made in the area of estimating fish size (length) from photographs including calibration marks or totems.



In addition, early efforts to identify individual fish within specific species via AI vision models have shown [promising results](#), as evidenced by recent efforts by the US Geological Survey in collaboration with Trout Unlimited. Developing the capability to identify recreationally landed fish by species, and to determine accurate length measurements would be an important catalyst to the efficiency and effectiveness of crowd-sourcing discard data from consumer fishing apps, like GotOne. **From a photo of an angler's catch, all relevant data could be captured - not only time, date, location, environmental conditions, but also species and length, without any data input from the angler, while increasing the validity and accuracy of angler-contributed data.** To accelerate the training of AI models to estimate fish lengths, improve species identification, and ultimately contribute to species-specific AI identification of individual fish, **we propose to:**

- a. **Create a common protocol for visual recording of recreationally landed fish** that would consist of full-length photos (one photo of each side of the fish) alongside measuring devices with calibration totems (the logo stickers in the photograph above). NOAA would work with ASGA, TNC, and GotOne to reach out to a broad cross-section of scientists, academic institutions, recreational anglers and for-hire captains to participate in the defined protocol. The resulting photographic database will then be used to train AI models to accurately estimate length. Over time, these photographic recordings may also serve a further training purpose, which is the development of species-specific models for identifying individual fish.
- b. **Enhance the GotOne app to provide automatic AI length estimation of fish photographed with the calibration totem in the frame.** In the photo above, we have designed three totems for testing and calibration: The circular (GotOne) totem is the diameter of a golf ball (1.68"). The ASGA and Hogy logos are the dimensions of a US credit card (3.375" x 2.125"). After training on photos of fish recorded with the measuring device and totems in view, we anticipate being able to provide accurate estimates of fish length, simply by having anglers hold a sticker, golf ball, or credit card alongside any fish that is photographed, obviating the need for a measuring

device. This capability can significantly increase the participation of anglers in discard length recordings, and greatly improve the accuracy of such measurements.

Length measurement estimations using calibration totems is already a relatively established AI approach. While length estimation of fish from photos captured in-situ (e.g. from underwater photography of fish in their environment) has proven challenging without specialized photographic equipment (Rishoholm, et al. 2022), our approach - creating a standardized protocol that includes the fish photographed against a single surface plane, with a ruler and totem in the frame, capitalizes on best practices and recent learnings in AI measurement to minimize error. In addition, since GotOne requires anglers to manually enter the fish's length, the proposed approach creates the triple redundancy of human measurement, visual confirmation from the measuring device (ruler) and the totem itself. For further quality control, we can elect to discard data where discrepancies across the three measurements occur. As part of its quality control process, GotOne's staff will also audit and monitor recorded fish and associated lengths to identify spurious or inaccurate data, and to use such discrepancies to further refine the model training.

4. **Outreach & Communications:** Through its network of fisheries scientists, for-hire captains, tackle industry partners, and recreational anglers, The American Saltwater Guides Association will lead outreach and education activities with help from The Nature Conservancy (in-kind contribution). This will include media and PR focused on fishing shows, science symposiums, and other forms of advocacy and marketing to encourage participation in data capture via the established protocol.

Data Delivery Plan:

The project team shares a deep conviction in the importance of common, shared data standards, and open access for qualified stakeholders to fisheries data. While there are many emerging benefits from the expanding universe of fishing apps available to recreational anglers, a potential for siloed data repositories and inconsistent data definitions creates a real risk of lost opportunity to leverage crowd-sourced data to support better management. **We envision GotOne continuing to play an important role in collecting recreational fishing data for use by research partners and agencies (e.g. NOAA), but shifting its approach to put ACCSP's data standards at its core. As such, data will be delivered to existing and future GotOne partners, and also made more widely available to ACCSP's own partners, via the data warehouse, rather than directly, as currently architected.** We plan to deliver data to ACCSP monthly, or as agreed based on further discussions with ACCSP. This integration will enhance the usability and compatibility of the data for fisheries management and research purposes.

As part of this proposed project, we will work closely with ACCSP to:

- Ensure data elements and metadata conform to ACCSP standards.
- Include comprehensive details such as species, length, condition, location, and time.
- Implement validation protocols to ensure data accuracy.
- Work closely with ACCSP to streamline data sharing and usage, contributing to ACCSP's goal of improving data collection and management across the Atlantic coast.

GotOne staff will be responsible for ongoing quality audits of catch recordings and associated data, as well as building on existing validation checks (e.g. geographical, environmental readings) in the GotOne database. For example, user recordings of striped bass landed in Africa would not be included in exported data payloads.

Geographic Location:

Atlantic coast (including the south Atlantic) and Gulf of Mexico. To date over the past 16 months since launch, over 2,500 anglers have contributed data on roughly 11,000 fish from every coastal state along the Atlantic and in the Gulf, as well as from the Exclusive Economic Zone (EEZ). We have existing partnerships with Atlantic States Marine Fisheries Commission (ASMFC), Louisiana Department of Wildlife and Fish (LDWF), Massachusetts Division of Marine Fisheries (MA DMF), Northeast Fisheries Science Center (NEFSC), and Southeast Fisheries Science Center (SEFSC).

Milestone Schedule:

Activity	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1.a. Align GotOne data w/ ACCSP	X	X													
1.b. Define/implement ETL approach with ACCSP		X	X	X											
2.a. Re-implement existing GotOne ETL through ACCSP				X	X										
2.b. Expand GotOne species	X	X	X												
3.a. Create common protocol for discard photo recording					X	X	X								
3.b. Enhance GotOne with AI length estimation							X	X	X	X	X	X			
Data ETLs for discard lengths to ACCSP					X	X	X	X	X	X	X	X			
Outreach, advocacy, education efforts to drive angler participation	X	X	X	X	X	X	X	X	X	X	X	X			
Semi and annual report writing							X						X	X	X

Project Accomplishments Measurement:

- **Sample Rate:** Number of data points (species, logged catches) on recreational discards and length measurements
- **User Engagement:** Number of active users and frequency of log entries
- **AI Accuracy:** Accuracy rates of AI-driven length measurement
- **Partnership Impact:** Contributions to partner projects and scientific studies
- **Outreach Effectiveness:** Levels of engagement and feedback from the fishing community
- **Data Delivery:** GotOne data delivered successfully to ACCSP warehouse and via ACCSP warehouse to research partners

Cost Summary:

Description	Cost	In-Kind
Personnel (a)		\$34,884.82
TNC Marine Scientists (Runde/Wilke)		\$19,884.82
GotOne Management support		\$15,000.00
Fringe (b)		\$15,283.47
(2) TNC Marine Scientists (32% Runde/Wilke)		\$15,283.47
Travel (c)	\$0.00	
Equipment (d)	\$0.00	
Supplies (e)	\$0.00	
Contractual (f)	\$200,000.00	
GotOne - Integrate GotOne's data into the ACCSP	\$40,000.00	
GotOne - Collect and deliver species-specific discard length data via ACCSP to support stock management	\$50,000.00	
GotOne - Train AI model for accurate discard length measurements /Create Common protocol	\$70,000.00	
ASGA - Outreach and communication to angling community and partners	\$40,000.00	
Other (h)	\$0.00	
Length data for 3 species already included in GotOne! (including infrastructure, sampling effort, outreach; valued at \$10k/species = \$30k)		\$30,000.00

Totals		
Total Direct Charges (i)	\$200,000.00	
Total Indirect Charges (j)		
Total In-kind		\$80,168.29
Total project cost (sum of Direct and Indirect) (k)	\$280,168.29	
Requested amount	\$200,000.00	
In-kind Percent Contributions	28.6%	

Budget Narrative:

- a. Personnel (0 Requested; \$34884.82 Match) The Nature Conservancy (TNC) will provide in-kind support from two staff (@10% each over 1yr = \$19,884.82). GotOne Media will provide in-kind management support (\$15,000). There is no request for salary from the ACCSP. TNC and GotOne Media staff CVs are attached. TNC provides unique advocacy, outreach, and marketing capabilities and connections across key stakeholder communities, including scientists, for-hire charter captains, tackle manufacturers and retailers, and the broader recreational fishing community.
- b. Fringe (0 Requested; \$15,283.47 Match) TNC will provide in-kind matching funds to cover fringe expenses (32%) associated with match salary.
- c. Travel (0 Requested)
- d. Equipment (0)
- e. Supplies (0 Requested)
- f. Contractual (\$200,000 Requested)
 - **Integrate GotOne database with ACCSP data warehouse and transfer GotOne historical catch data (\$40,000 to GotOne Media):**
 - Deliverables:
 - Discovery and design phase required to understand ACCSP data standards and requirements, and technical integration details
 - Alignment of GotOne data definitions and database with ACCSP standards, as necessitated via modifications to database or through ETL process design.
 - Modifications to current GotOne app user interface, as needed.
 - Exporting of existing (historical) GotOne catch and discard data from 2023 through 2024 into ACCSP data warehouse, including quality audit/validation of data by GotOne team (exports of existing GotOne data to ACCSP will exclude items where there is low confidence in accuracy, for instance in the case of duplicate records or catch recordings outside US coastal waters).
 - >12,700 catches, 29 species for >2,600 anglers as of August 2024
 - Data available for sharing with ACCSP:

- Catch location (integer long/lat, state)
- Catch time and date
- Species
- Length
- Air, water temperature
- Wind speed, direction
- Tide and moon stage
- Project team and cost breakdown:

	Days	Total
Front end	10	8,750
Tech lead	9	11,250
Prod man	8	6,000
Proj man	8	4,000
Back end	10	5,000
Data analyyst	10	5,000
Total:		40,000

- **Add** **new species to GotOne app and establish ongoing collection and delivery of catch and discard length data to ACCSP to support stock management (\$50,000 to GotOne Media):**
 - Deliverables:
 - Redesign ETL approaches for current GotOne research partners to align with new ACCSP-based approach
 - Establishment of data sync processes to load GotOne data into ACCSP data warehouse for all forward-going catch recordings, including data validation.
 - Add 12 new species to GotOne for catch and discard length recording (10 new species on ACCSP's Biological Sampling Priority Matrix plus 2 NOAA priority species)
 - Establish regular ETL of discard length data for all relevant species (new and historical) into ACCSP data warehouse
 - Note that these costs cover initial setup and implementation of the 12 new species in GotOne. **Addition of new species as well as ongoing maintenance and support for data transfers will be evaluated after twelve months**

- Project team and cost breakdown:

	Days	Total
Front end	10	8,750
Tech lead	10	12,500
Prod man	9	6,750
Proj man	9	4,500
Back end	10	5,000
Data analyst	10	5,000
UX/Design	10	7,500
Total:		50,000

- **Train** **AI model for accurate discard length measurements from photographic input, and create common protocol for image capture for training AI models for future capabilities (\$70,000 to GotOne Media):**

- Deliverables:
 - Define protocol for visual recording of landed fish to support training of AI length-estimation model
 - GotOne app development for enhanced visual data capture and metadata requirements
- Project team and cost breakdown:

	Days	Total
Front end	6	5,250
Tech lead	10	12,500
Prod man	10	7,500
Proj man	10	5,000
Back end	9	4,000
Data analyst	9	4,500
AI lead developer	25	31,250
Total:		70,000

- **Outreach and communication to angling community and partners to drive awareness, engagement and participation (\$40,000 to ASGA)**
 - Video Production to promote app, drive usage, and train anglers (\$15k)
 - Promotional items - boat stickers with QR codes, rulers with logo to aid in AI training for fish length, occasional give-aways for App usage and adoption (example prizes - sunglasses, jackets, etc.) (\$5K)
 - Outreach via events and social media - Example event ASGA roadshow <https://www.saltwaterguidesassociation.com/the-asga-roadshow/> & Hands-on training for fishing guides on app usage for grassroots outreach (\$15k)
 - Website upgrades & tournament integration - app usage during tournaments will serve to increase usership and uptake, this will require website investments and upgrades to facilitate (e.g. real-time web updates) (\$5k)

- g. Indirect (\$0 Requested; \$15,283.47 Match)
TNC will provide in-kind indirect charges of \$15,283.47. TNC brings science and federal fisheries expertise

- h. Other (\$0 Requested; \$30,000.00 Match)
 - GotOne project leadership and oversight
 - GotOne outreach to industry partners for promotion and awareness
 - GotOne outreach to existing research partners to align initiatives with grant requirements
 - Technical infrastructure costs (GotOne database, image storage, AI API / web services, technical maintenance and support during grant period)

First year deliverables and anticipation of future costs:

In this first year of funding, we will complete all of the activities listed under letters f, g and h above, including all maintenance and technical support requirements. The proposed project is envisioned as a pilot, and as such, we have not as yet ascertained the required ongoing costs to maintain the proposed data integrations past the grant funding period. Part of the scope of the proposed work will be to determine these forward-going requirements and costs, which may lead to a request for a maintenance grant in forward-going years. However, if such maintenance is not funded through ACCSP, our intention, as an in-market product, would be to find independent funding for the capabilities developed as part of this project proposal to support our growing user base and research partnerships. In any event, our expectation would be that any ongoing maintenance costs will be significantly lower than the initial implementation costs as the data migrations processes become increasingly automated.

References:

Goldsmith, W., K.M. Wilke, B.J.Runde, D. Moss. 2024. Future Directions for Electronic Self-Reporting in U.S. Marine Recreational Fisheries. Submitted for publication.

Risholm, P., A. Mohammed, T. Kirkhus, S. Clausen, L. Vasilyev, O. F. Øistein. 2022. Automatic length estimation of free-swimming fish using an underwater 3D range-gated camera. Aquacultural Engineering. v97. <https://doi.org/10.1016/j.aquaeng.2022.102227>

Summary of Proposal for Ranking Purposes

Proposal Type: New

Program Priority:

- **Biological Sampling: 50%** - photos, species ID, length (add 12 new species to GotOne for discard length recording - 10 new species on ACCSP's Biological Sampling Priority Matrix plus 2 NOAA priority species)
- **Catch and Effort: 50%** - recreational catch and discards >12,700 catches, 29 species for >2,600 anglers as of August 2024
- Social and Economic: while not the priority of this project, the GotOne! app has potential to provide valuable socio-economic data in the future which is why integration with ACCSP data standards and warehouse is important

Overview:

Catch, effort, discard, and biological data from private anglers are difficult to collect. GotOne is a consumer application, developed by fishermen to serve as a personal logbook to record catch information and corresponding environmental covariates (pulled automatically from third-party APIs with access to sensors and other established data sources). The project team has been growing usership over the last year through partnerships with ASMFC, LDWF, MA DMF, NEFSC, and SEFSC—encouraging anglers to use the app to fill data gaps for specific priority species. As anglers continue to find value in the app to enrich their fishing experience, we anticipate usership to grow over time, providing a valuable stream of data.

This project will build on our work to develop the capability to use AI as a validation technique for species identification and length. From a photo of an angler's catch, all relevant data will be captured - not only time, date, location, environmental conditions, but also species and length, without any data input from the angler, while increasing the validity and accuracy of angler-contributed data.

Through this project, GotOne! will establish a connection with ACCSP, through the SciFish API, to provide data to the ACCSP data warehouse, thus making data to project and Program partners in a timely and transparent manner. We see this project as a pilot to allow us to align with ACCSP data standards and to develop protocols for data transfer to the Program warehouse. We will estimate costs associated with on-going future data transfers.

Project Quality Factors:

Partners

- **Multi-Partner/Regional impact including broad applications** - Broad partnerships including ASMFC, LDWF, MA DMF, NEFSC, and SEFSC facilitates data collection from a wide geographic range along the Atlantic coast, including the south atlantic, and the Gulf of Mexico. The GotOne! App and AI technology can be used to collect data across a broad range of species, over the last year >12,700 catches, 29 species for >2,600 anglers have been logged. And usership continues to grow. Integration with ACCSP's data warehouse means this information will be available on an ongoing basis for data requests and stock assessments for regionally managed species.

Funding

- **Contains funding transition plan on pg 16**

In this first year of funding, we will complete all of the activities listed under letters f, g and h above, including all maintenance and technical support requirements. The proposed project is envisioned as a pilot, and as such, we have not as yet ascertained the required ongoing costs to maintain the proposed data integrations past the grant funding period. Part of the scope of the proposed work will be to determine these forward-going requirements and costs, which may lead to a request for a maintenance grant in forward-going years. Our expectation would be that any ongoing maintenance costs will be significantly lower than the initial implementation costs as the data migrations processes become increasingly automated.

- **In-kind contribution:**

28.6%

TNC - \$35,168.29
GotOne! - \$45,000
Total - \$80,168.29

Data

- **Improvement in data quality/quantity/timeliness:** Quantity of discard length data will be increased. For example, NOAA Fisheries currently collects roughly 40 bluefish discard lengths per year. Last season alone, GotOne collected over 800 bluefish discard lengths from recreational anglers.
GotOne Media will be responsible for QA/QC of data. Through this project we will align GotOne data with ACCSP data standards and use the SciFish API to provide data to the ACCSP data warehouse, demonstrating possible best practices for data-sharing by other consumer apps. The GotOne data architecture and ETL process is highly flexible and dynamic, and can provide on-demand data transfers, as needed. Currently, transfers with existing research partners are conducted as frequently as weekly. Our intention as part of

this project is to determine the optimal cadence and frequency of data deliveries based on ACCSP's desires and needs, as well as the SciFish API capabilities.

- **Potential secondary module as a by-product:** Secondary module is Catch & Effort - recreational catch, discards, and environmental covariates from 2,600 users (and growing) across 29 species. Socio-Economic data may be made available to the Program and Program Partners as a by-product of the app.
- **Innovative:** The GotOne! App is innovative in that it was designed by fishermen as a personal logbook that improves fishing success. Because it provides value to anglers, it's likely to gain increased usership and increased retention of users over time (Goldsmith *et al.*, in press). In addition, this project will build on Artificial Intelligence to be used in photo fish ID as a means of data validation.
- **Impact on stock assessment** - Agency partners have identified release lengths as a critical data gap for multiple recreational species. Released fish are an important component of the catch data for many stock assessments, however, very little information is available to characterize the length distribution of these released fish. Release lengths for multiple species collected through GotOne! and provided to the ACCSP data warehouse will be available to agency partners for use in stock assessment. These direct length observations will help reduce assumptions often made about release length distribution and improve uncertainty in model estimates.

Other Factors

- **Properly Prepared** - This proposal follows the guidelines provided in the ACCSP Funding Decision Document.
- **Merit** - This project fills gaps in biological data for ACCSP and NOAA priority species. This project also facilitates data accessibility and sharing by establishing a mechanism to deliver data collected by private anglers through a commercial app into the ACCSP data warehouse.