SAFMC Citizen Science Program
Citizen Science Research Priorities

Age Sampling^:

a. Target volunteers: Recreational
b. Data needed: otolith collection, ==fin clips (still developing)==
c. Target species: ~~Cobia, Greater Amberjack,~~ Scamp, Snowy Grouper, Gag, Knobbed Porgy, Porgy complex, ~~Almaco Jack, Dolphin,~~ Wahoo, Lane Snapper, Hogfish (~~GA-NC~~ ==both== stock~~s~~), Red Grouper, ==Black Grouper==, Vermilion Snapper, Blueline tilefish, ==Black Seabass (private recreational), Gray Triggerfish (spines), Spiny Lobster (ossicles)==
d. Anticipated outcome: characterize the age of catches
e. Potential cost: $$

RECOMMENDATION: Support keeping as a research priority

- *Having more age data from the recreational sector is a high priority*
- *Recommended removing some fish from target species due to difficulty in sampling otoliths (all Jacks) and/or higher data needs for species (Dolphin, Cobia)*
- *Recommended adding species based on the updated SAFMC Research & Monitoring Plan (R & M Plan) – Black Grouper, Hogfish (both stocks), Black Seabass (private recreational), and Gray Triggerfish; also noted that sampling Gray Triggerfish could be easier to sample due to use of spines for ageing*
- *Research is being done on getting age data from fin clips, looks very promising; group recommended adding fin clips to the data needed – but noted this methodology is still developing*
- *Noted in-person volunteer training would likely be needed, could be helpful to combine in-person with virtual training (e.g., video); noted education component on bias would need to be included in volunteer training*
- *Pilot / beta testing would be critical when developing a project under this priority*
- *Age data are critical to assessment but can be influential, so sampling design and protocol will be important to any projects addressing this priority; would be helpful to have assessment scientists provide an example of the design needed for data to meet intended use*

Maturity Data^:

a. Target volunteers: Recreational and commercial; tournaments
b. Data needed: gonad collection (either actual biological samples or pictures)
c. Target species: Cobia, Red Porgy, Snowy Grouper, Spiny Lobster, Gag, Red Grouper, Black Grouper, Scamp, Black Seabass, Greater Amberjack, Wahoo, Mutton Snapper, ==Hogfish==
d. Anticipated outcome: improved reproductive information
e. Potential cost: $$

RECOMMENDATION: Support keeping as a research priority

Recommended changes are highlighted in yellow or strikethrough text.

^Projects under these priorities would likely require a high level of involvement or collaboration between multiple organizations.

- *Recommend adding Hogfish as an additional species due to the updated SAFMC R & M Plan*
- *SERFS sampling provides reproductive information for many South Atlantic stock assessments; having samples for species that spawn outside of their sampling season (SERFS sampling season ~April to October) would be helpful*
- *Storage for biological samples could be challenging; cannot be frozen and can only be on ice for a limited period before needing to be placed in formalin*
- *Photos would likely be more useful for non-hermaphroditic species and would be especially helpful for sex ratio information*
- *Sampling design not as critical as for age data; ideally would like samples from whole spawning season*
- *Would need to gather ages along with gonad samples because these data typically incorporated into assessment models as maturity at age*
- *Could be more suited to dedicated individuals; maybe 'fish cutters' could be trained (would likely need an incentive); could try to partner with tournaments or with the headboat survey*

Discard Information:
a. Target volunteers: Recreational and commercial
b. Data needed: length of fish; depth caught/released; number of fish; reason for discard; devices used; when and where fish are released
c. Target species: all SAFMC managed species in particular, Scamp, Red Snapper, deepwater groupers, Red Porgy, Greater Amberjack, Cobia, King Mackerel (sub-legal releases), and Gray Triggerfish
d. Anticipated outcome: improved discard removals estimates, ability to characterize size composition of discards, could help monitor recruitment for some species (e.g., Gag)
e. Potential cost: $-$$

RECOMMENDATION: Support keeping as a research priority
- *Number of released fish is increasing in many South Atlantic fisheries; having more information on released fish is a high priority; use of barotrauma mitigation techniques is important and starting to be incorporated into assessments/projections*
- *Recommend adding 'when and where fish are released' to data needed and 'could help monitor recruitment for some species (e.g., Gag)' as an anticipated outcome*
- *Helpful to explore tools to make data collection easier for fishermen*
- *Commercial and for-hire already report number of discards by species through logbook; additional ask to have these fishermen share information on released fish via different project; incorporating some of these critical fields (length, release treatment, predation) into logbooks could help streamline data collection*

Genetic Sampling^:
a. Target volunteers: Recreational and commercial; bait and tackle shops; tournaments
b. Data needed: fin clips

Recommended changes are highlighted in yellow or strikethrough text.

^Projects under these priorities would likely require a high level of involvement or collaboration between multiple organizations.

c. Target species: Cobia, Hogfish (both stocks), Red Grouper, White Grunt, Spanish Mackerel, Dolphin, ==Wahoo, Black Grouper/Gag, Scamp/Yellowmouth==
d. Anticipated outcome: stock identification, ==species identification, ageing (still developing)==
e. Potential cost: $-$$

RECOMMENDATION: Support keeping as a research priority
- *Recommended adding species identification and ageing (still developing) under anticipated outcomes*
- *Recommended adding Wahoo, Black Grouper / Gag, and Scamp / Yellowmouth under target species due to updated SAFMC R & M Plan and/or issues with species identification*
- *Group noted that genetics are an evolving and increasingly powerful tool; can be used for stock identification, close-kin mark-recapture can be used to estimate abundance, in the future could be used to age fish; could be worthwhile to collect samples to 'bank' for future use*
- *Noted that fin clip sampling is less complex than other biological samples (otolith, gonad) and storage may be less problematic as buffer is more benign; several successful projects partnering with fishermen to gather fin clips*

Fishing Infrastructure:
a. Target volunteers: Recreational, commercial, and community members/citizens
b. Data needed: GPS location of existing and previously existing/closed fishing-related infrastructure (commercial fishing facilities, marinas, bait/tackle shops, ice house, fuel docks, boat ramps, piers, roadside seafood stands, retail markets, etc.)
c. Anticipated outcome: Baseline for fishing-related infrastructure to help document potential impacts from regulations, ==could help define communities and better understand key fishing hubs for social analysis for FMP amendments==
d. Potential cost: $

RECOMMENDATION: Support keeping as a research priority
- *Recommended adding 'could help define communities and better understand key fishing hubs for social analysis for FMP amendments' under anticipated outcome*
- *Group noted this is especially important for the commercial and for-hire sectors and is becoming increasingly important with the loss of working waterfronts*
- *Noted that many states have done work; some important to see what data already exist prior to developing project; noted recent CAFA grant proposal focused on infrastructure*
- *Could be better suited to a dedicated group of individuals (e.g., grad students), but would combine this approach with citsci*

Historical Fishing Photos:
a. Target volunteers: Recreational and for-hire
b. Data needed: digitized images (will need to scan print photos into digital format)
c. Target species: commonly caught charter/headboat species

3

Recommended changes are highlighted in yellow or strikethrough text.

^Projects under these priorities would likely require a high level of involvement or collaboration between multiple organizations.

   d. Anticipated outcome: length comps for certain species; improved historical information; ==potential for index development==
   e. Potential cost: $-$$

RECOMMENDATION: Support keeping as a research priority
- *Recommend adding 'potential for index development' under anticipated outcome; current FISHstory project will be working with NC State / SEFSC on potential index development for King Mackerel and Red Snapper*
- *Documenting more information on historic fisheries catches can help us better understand health of current fisheries; noted these photos are a way to provide quantitative data on historic fisheries – not just anecdotal data*
- *Fishermen, scientists, and members of the public have shown interest in this priority through the current FISHstory project*

Fishery Oral Histories^ ==and Historic Personal Fishing Logbooks/Diaries:==
   a. Target volunteers: For-hire and commercial captains
   b. Data needed: interviews with fishermen to learn about the history and current state of a fishery; ==translate fishermen's historic logbooks into electronic data;== possibly pair interviews ==or logbooks== with topic #6 (Historical Fishing Photos)
   c. Anticipated outcome: documentation of how fisheries operated over time (catchability changes over time with improvements in technology; markets; clients; species distribution; size of fish; weather; etc.) and other observational data
   d. Potential cost: $==-$$==

RECOMMENDATION: Support keeping as a research priority and combining oral histories with historic logbooks into one priority
- *For oral history component – noted examples in other regions where this info has been useful for management (e.g., Spanish Mackerel); noted there are some existing projects ('Voices in the Fishery')'; some information may already exist through newspaper articles, etc.*
- *Group discussed possibly removing the 'Historic Personal Fishing Logbooks/Diaries' priority noting sensitive nature of this type of information and possibility of getting similar information through oral histories and photos; decided best to incorporate into the 'Fishery Oral History' priority; noted that some logbooks may be difficult to understand and would need to have close communication with captains*
- *Committee member asked if this type of information could be used to inform catchability; noted that this can be tricky to incorporate because the changes are often different for different fleets, with better information could be possible to include in index standardization – but likely to be more of a comparison*

Oceanographic/Environmental/Weather Conditions:
   a. Target volunteers: Recreational and commercial

Recommended changes are highlighted in yellow or strikethrough text.

^Projects under these priorities would likely require a high level of involvement or collaboration between multiple organizations.

b. Data needed: Bottom temperature; weather impacts to fishing; presence/absence of sargassum and size of area; movement of forage fish (bait) and shifts in patterns of a fishery (i.e., mackerel)
c. Anticipated outcome: building database on climate and conditions; distribution of sargassum; how forage fish impacts patterns in a fishery
d. Potential cost: $-$$

RECOMMENDATION: Support keeping as a research priority
- *Collecting this information would be feasible during normal fishing activities; particularly if data logger placed on fishing gear and passively collects data*
- *This type of information could be increasingly important with climate change*
- *Could be challenging to fund but could provide more microscale information than other methods*
- *Having a logger that collects location information could be sensitive for participants; trust issue may arise*
- *May be an opportunity to collect this type of information through SciFish instead of via data logger; could collect specific information (time, water temp, species observed, etc.) with more general location info*
- *Committee member noted that if project developed to collect information on the presence/absence and/or size of area of sargassum would need to develop a scale that volunteers could consistently use (videos/photos could help)*

Shifting Species and Rare Event ~~or Data Limited Species~~ Observations:
a. Target volunteers: Recreational and commercial
b. Data needed: Point observations of ~~data limited or~~ unusual or rarely encountered species for areas along the Atlantic coast
c. Target species: all managed species, but especially - dolphin, King Mackerel, Spanish Mackerel, shrimp, Wahoo, Black Seabass, Tilefish
d. Anticipated outcome: baseline and/or early warning for species shift ~~increasing information available for data limited species~~
e. Potential cost: $-$$

RECOMMENDATION: Support splitting into two research priorities – 'Shifting Species and Rare Events' and 'Data Limited Species Observations'
- *Could be valuable to capture information on shifting species which is a topic of interest to Council*
- *For Species Shifting priority - recommend noting value in collecting this information for all managed species, but highlighted a few specifically mentioned in the SAFMC R & M plan*
- *Noted that AI and/or social media could be used to collect data for a project like this; then could follow up with fishermen; could explore involving volunteers in finding images via social media*

Rare or Data Limited Species Observations:
a. Target volunteers: Recreational and commercial, divers
b. Data needed: length information for data limited species
c. Target species: Hogfish (both stocks), snapper and grouper species, spiny lobster

Recommended changes are highlighted in yellow or strikethrough text.

^Projects under these priorities would likely require a high level of involvement or collaboration between multiple organizations.

    d.   Anticipated outcome: increasing information available for data limited species, in particular length compositions

    e.   Potential cost: $-$$

RECOMMENDATION: Support splitting into two research priorities – 'Shifting Species and Rare Events' and 'Data Limited Species Observations'

- *Focus on projects like SMILE*

~~**Historic Personal Fishing Logbooks/Diaries:**~~

    ~~a.   Target volunteers: For-hire and commercial~~

    ~~b.   Data needed: translate fishermen's historic logbooks into electronic data/database~~

    ~~c.   Anticipated outcome: develop relative indices of abundance~~

    ~~d.   Potential cost: $-$$~~

RECOMMENDATION: Support combining with oral histories into one priority; see combined research priority for detail

Observations in Managed Areas^:

    a.   Target volunteers: Recreational and commercial, divers

    b.   Data needed: species, length, depth, videos/photos, effort in closed areas

    c.   Target species: snapper and grouper

    d.   Anticipated outcome: species composition, changes in fish abundance over time, occurrence of spawning, information on compliance

    e.   Potential cost: $$

RECOMMENDATION: Support keeping as a research priority

- *Discussed that projects in this area could be more Cooperative Research than CitSci – but noted citsci observations could lead to cooperative research projects; also noted that having this on the citsci priority list helped encourage TNC developing a project in this area*
- *Recommend adding 'effort in closed areas' under data needed; recommended adding 'occurrence of spawning' and 'info on compliance' under anticipated outcomes*

Movement and Migration:

    a.   Target volunteers: Recreational and commercial, focus on supporting and working with existing tagging programs

    b.   Data needed: species, location, length, tag details

    c.   Target species: Dolphin and Wahoo

    d.   Anticipated outcome: movement and migratory patterns

    e.   Potential cost: $-$$

Recommended changes are highlighted in yellow or strikethrough text.

^Projects under these priorities would likely require a high level of involvement or collaboration between multiple organizations.

RECOMMENDATION: Support keeping as a research priority 'as is' with emphasis on supporting existing tagging programs

Shark & Marine Mammal Depredation:
   a. Target volunteers: Recreational and commercial
   b. Data needed: observations of shark depredation, location, species, photo, DNA swabs
   c. Anticipated outcome: document shark depredation observations
   d. Potential cost: $-$$

RECOMMENDATION: Support keeping as a research priority and recommend adding 'Marine Mammal' into priority title
   - *Recommended adding 'photo' and 'DNA swabs' to data needed; the latter due to a shark depredation project being conducted in FL*
   - *Noted that information could be helpful as species distributions are shifting; could see how overlap with predator species; could impact spawning aggregations*
   - *Could be role for AI / social media -fishermen often tag social media posts with #taxman when there is shark depredation*
   - *Noted that in Oregon Inlet, tuna fleet has shifted effort due to shark depredation*
   - *Suggesting exploring adding information on depredation to commercial and for-hire logbooks*
   - *Noted depredation rate (# species depredated/total caught) may be more informative to assessment*

Habitat Characterization:
   a. Target volunteers: Recreational and commercial, divers
   b. Data needed: photo/videos, location
   c. Anticipated outcome: ground truth bathymetry data
   d. Potential cost: $-$$

RECOMMENDATION: Support adding as a research priority
   - *CitSci Advisory Committees supported developing a priority for fishermen and divers to help ground truth bathymetry data*

Spiny Lobster Data
   a. Target volunteers: Recreational and commercial
   b. Data needed: catch, effort, carapace length, sex, presence of eggs
   c. Anticipated outcome: characterize fishery
   d. Potential cost: $

RECOMMENDATION: Support adding as a research priority
   - *Group supported either developing new priorities to gather information on spiny lobster north of Florida or incorporating spiny lobster data north of Florida into current priorities*

Recommended changes are highlighted in yellow or strikethrough text.

^Projects under these priorities would likely require a high level of involvement or collaboration between multiple organizations.

- *Staff still looking into past assessments and management measures to help determine what type of data would be most helpful; staff also plan to reach out to others with Spiny Lobster expertise*
- *Staff met with Spiny Lobster experts from FL FWC and they noted having more information to characterize the fishery throughout the South Atlantic would be helpful (as opposed to just GA north)*

Other feedback provided through the research priority discussion that could be applied more broadly to the Citizen Science Program

- *Exploration of study fleets – especially in the recreational sector – could be used to address many of these research priorities*
- *May be helpful to look at the priorities from the recent Climate Scenario Planning work done in the Atlantic for areas of overlapping priorities*

Recommended changes are highlighted in yellow or strikethrough text.

^Projects under these priorities would likely require a high level of involvement or collaboration between multiple organizations.