

**FISHSCAPE MTAG Meeting  
Meeting Minutes  
14 NOV 2022**

**Personnel on Zoom:**

*FIU* - A. Harborne, Y. Papastamatiou, R. Santos, J. Fourqurean, J. Campbell, M. Malone, D. Butkowski  
*MTAG* – T. Ferraro, C. Collier, J. Serafy, N. Parr, V. McDonough, A. Bruckner  
*NOAA Program Officer* – K. Puglise

**Action Items:**

**All MTAG Members:**

1. Please inform us of any potential deadlines over the next few years where FISHSCAPE data could be useful (e.g. discussions about rezoning)
2. We are interested in any opportunities for engagement and outreach
3. Between meetings, please let us know ([aharborn@fiu.edu](mailto:aharborn@fiu.edu)) if you have further questions about the project or there are ways in which our data can better meet management needs

**Meeting Minutes:**

**Introductions 15:07 -15:13**

Few people on MTAG not in attendance today due to scheduling conflicts. Smaller meeting will be held with C. Pollock, R. Boucek, and D. Morley on December 2nd.

**A. Harborne:**

What is an MTAG?

Management Technical Advisory Group – part of NOAA’s call for proposals  
Goals – effective collaboration between PI’s and end users (managers). Improve project benefits and facilitate transfer of information derived from this work

**Management Technical Advisory Group**

- “...establish a management transition advisory group (MTAG) to ensure effective collaboration between the project PI(s) and end users occurs and research results are transferred to the end users.”
- “The end users can then help facilitate the transfer and use of information derived from this work for management applications, including sustainable fisheries management, habitat conservation and protection, and protection of listed threatened or endangered species.”

Last Name	First Name	Title	Organization
Bruckner	Andy	Research Coordinator	NOAA - FKNMS
McDonough	Vanessa	Fishery and Wildlife Biologist	Biscayne NP
Pollock	Clayton	Fisheries Biologist	Dry Tortugas NP
Serafy	Joe	Research Fishery Biologist	NOAA/NMFS/SEFSC
Parr	Nick	Aquatic Preserves Manager	FDEP
Ferraro	Trudy	Biological Scientist	FDEP - John Pennekamp
Boucek	Ross	FL Keys Initiative Manager	Bonefish & Tarpon Trust
Morley	Dani	Assistant Research Scientist	FWC
Collier	Chip	Deputy Director for Science	South Atlantic Fishery Management Council

**K. Puglise:** Thanks to all for agreeing to be a part of this MTAG. Helps get information directly to management.

### **A. Harborne: Project Overview**

Provided details on project background, research questions, timeline 2021-2026

Target areas = upper (2022-2023), middle (2023-2024), and lower Keys (2024-2025) – representing different seascapes. PowerPoint presentation can be circulated as required.

Long term seagrass monitoring data (collected by Fourqurean lab) will be used to quantify change over time. Data suggest dynamic nature of seagrass and transition probability data can inform likelihood of change in habitat types and drivers of that change.

JF: all long-term sites coincide with water quality monitoring

Extensive data collection and outputs from project

End Goal: online tool that summarizes project findings – generalizable across Keys for model species. Accessible to a wide range of users in FL and wider Caribbean.

Telemetry: 4 species, 50 tagged individuals tagged in Upper Keys study area

Broad tracking across a ~7km x 7km study region, within this we have a fine scale/high resolution array

Preliminary data showing yellowtail snapper track

Habitat mapping: using satellite imagery, drone mapping, goal: have high-resolution imagery available for study sites and use high-resolution imagery to improve habitat mapping throughout keys.

E-Scapes: combine habitat mapping with spatial patterns in costs/benefits to foragers. Show energy available across landscape

Stable isotope analysis: Sampling basal resources and fish community – primarily used to determine proportion of diet obtained from seagrass beds

Stomach contents – will also inform what fish are eating

Bioenergetic models – quantify consumption rates for each species, will allow us to project energy expenditure across seascapes

### **Future MTAG Interactions: 15:37-15:41**

Annual Meetings (remote or hybrid)

- Timing – Fall suggested as many participants traveling or in the field during the summer
- Potential for in-person meetings if possible
- In-person capstone workshop suggested for 2025-2026

Please inform us of any potential deadlines over the next few year – especially with respect to rezoning

We are also interested in opportunities for engagement and outreach  
Hopefully, MTAG members can serve as ambassadors of this work

While our work is focused on fishes, there is potential for data generated on this project to inform on lobster ecology/fishery as well, as lobsters exhibit similar foraging patterns into adjacent seagrass beds. Collaboration with FIU student Casey Butler

### **Questions/Discussion: 15:41 – 15:58**

**J. Serafy:** Is there a plan to use NOAA visual survey data?

**AH:** Yes, we are currently working with this data set across the Keys and have plans to integrate this data into FISHSCAPE via population trends.

**JS:** Day surveys, yet nocturnal use of seagrass habitat

**AH:** fish surveyed on reef will use adjacent seagrass – believe we will capture the fish populations from this dataset and can infer nocturnal foraging, which is also captured by acoustic tracking data

**JS:** Have you considered other potential costs associated with seagrass use? Paul Sikkel's research on parasites in seagrass beds?

**AH:** Yes, we are currently in contact with PS and have plans for collaboration/coordination  
This could explain some of the flush/crash dynamics that occur in fish populations across patch reef habitats

**C. Collier:** Mentioned seminar series with South Atlantic Council. Occurs the second Tuesday each month. This may be a good opportunity for engagement (occurs through webinars 45 min presentation, 45 mins for questions). Any bounceback (signal collision) from fish in array?

**AH:** fish tagging spread out from July to October. These tags are 3-month duration and tag life is already completed for the smaller tags

**YP:** Experimental design discussed with Innovosea and should minimize this potential problem. We can also quantify noise quotients were from receiver metadata

**DB:** Transmitters are also on a random delay – even if there is collision, shouldn't be a consistent problem throughout the project

**CC:** Have you considered using Greater Amberjack as a potential higher trophic species instead of barracuda? Lots of other work in South Atlantic on Greater Amberjack and may be a useful species to study.

**DB:** Study array is shallow, inshore of Pickles reef. Greater amberjack would be in deeper waters than in our study area

**AH:** Barracuda should be easier as move down through keys. Have a reasonable sample size for full project. We plan to leave receivers in the upper box to capture barracuda tags (which last 3 years)

**J. Serafy:** Consider the critique that research is “too local” or “too small scale” – “doesn't refer to the stock”. Doesn't relate to the general interest of how humans/fishers interact with

populations. What your thoughts on generalization across larger scales? Or incorporates human behavior or fishing pressure.

**AH:** Very useful to know. Working on model species for different trophic levels. Though modeling and mapping we can say how movements relate to reef-tract scale. Build generic understandings that can then be used to understand larger-scale patterns.

**RS:** E-scape maps will also help address this – build models that quantify where energy is produced for x amount of fish or x amount of biomass. This is informative to management

**YP:** Mechanistic approach to the movements of animals – this is scalable. Gives us much more predictive power

**AH:** Second project meeting proposed for early fall

If you think of ways this study could be improved to fit the needs of your management group we hope to be dynamic and can work with folks individually to try and meet your management needs

**J. Fourqurean:** This could connect nicely with projects like Iconic Reefs (**A. Bruckner**) – would appreciate being connected to that effort.

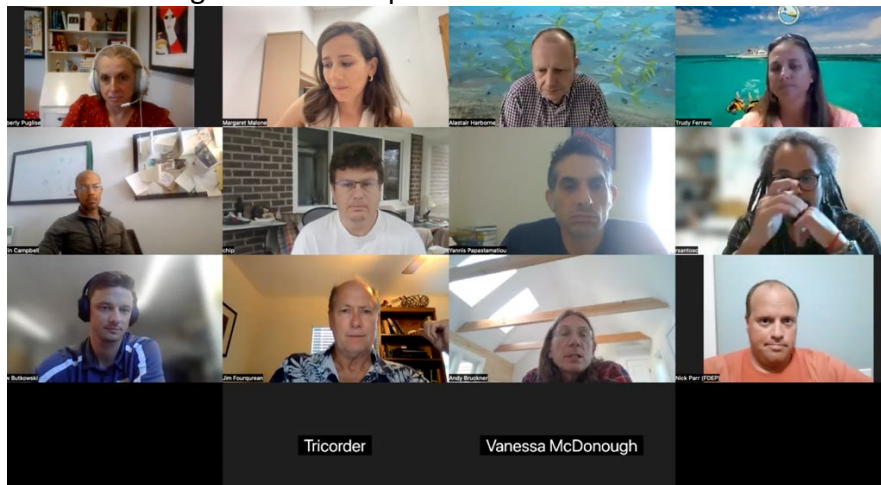
**AH:** we can also parameterize model scenarios to higher fish populations or other positive management outcomes that may be informative to Iconic Reefs. We should consider extrapolating our findings to the 6 or 7 iconic reef sites specifically.

**J. Serafy:** Are there manipulative/experimental components of the project?

**AH:** Yes, mesocosm foraging experiment. Fish physiology in lab, exclusion caging studies into adjacent seagrass beds

**Final:** Thank you for joining us for this first meeting!

MTAG Meeting Recorded – Uploaded to shared OneDrive



**MTAG 2  
MEETING MINUTES  
2 DEC 2022**

**Personnel on Zoom:**

*FIU* - A. Harborne, M. Malone

*MTAG* – C. Pollock, D. Morley, R. Boucek

*NOAA Program Officer* – K. Puglise

**Meeting Minutes:**

**Introductions 15:07 -15:10**

**AH:** Project introduction and overview (same Project Overview notes as above)

Goal of MTAG is to identify and generate useful outputs for end users.

Increase awareness of project

Identify potential collaborations and outreach opportunities

Seagrass – many fishes use this habitat, however they are poorly represented in MPAs

Question: How much seagrass is necessary to support reef fishes?

Consider stability of seagrass beds and incorporate dynamics into future proofing of SPAs

Project will run from 2021-2026

Online Tool: Project end goal is to have an interactive online tool for managers. For a given species of interest on a reef of interest it will predict the area of seagrass use. Potential to run different future scenarios of changes in habitat quality (because of storms or decreasing water quality).

**Questions/Discussion: 15:34 – 16:14**

**CP:** Potential opportunities for engagement with the project

[Adrian Jordaan](#) – UMass-Amhurst, student Ashleigh Novek and Grace Casselberry

Acoustic telemetry research and interactions between sharks and these species

Consider collecting data on invertebrates such as queen conch during seagrass surveys

**AH:** yes, we will be doing seagrass surveys for fishes and invertebrate prey. Will have capacity to record this type of data. Very interested in leveraging this data for other uses, especially stable isotopes, BRUVs.

**DM:** FWC is also doing stable isotopes throughout the Keys

**AH:** Yes we will keep up to date with that work, especially since FWC is considering higher resolution amino acid analyses that we aren't planning to work with

**DM:** There is extensive collecting of baseline samples –possibility of sharing data

**RB:** Management outcome is to extend or modify SPAs. Purpose to reduce or separate marine use that harm environment. What are the main uses that you are worried about in seagrasses and will you quantify anthropogenic stresses?

**AH:** our role is to support those decisions. SPAs come with a higher level of enforcement. We've observed the high fishing pressure on, for example, patch reefs within seagrass areas. This pressure would be reduced with expanded SPA coverage and thus capture the entire home range of these species

We don't have social-economic component as part of this project.

**CP:** VPS system – what scale is the array and how far apart are the receivers and what is your detection range?

**AH:** Area of full array = 7km x 7km, fine scale array = 600m x 600 m, each receiver is about 200m apart. Detection range = 200m from range detection test earlier in summer

**CP:** Bioenergetics – inferences about how fishes are behaving in VPS and applying it to how fishes are behaving beyond the VPS?

**AH:** Yes, will know habitat use and from physiology we will know how much energy is burned swimming that distance and how much food they will consume, this will vary by species, individuals and with size. Utilization statistics from telemetry will be key for this part of the study to help extrapolation beyond VPS.

**CP:** You will extract habitat data from drone work and apply at a larger scale, but how will you do this with fish abundances? Specifically, how are you quantifying use within seagrass areas as much data available on fishes is focused on hard bottom habitat?

**AH:** We will have to do some surveys on seagrass habitats to supplement data from RVC surveys

**CP:** UF student [Alex Gulick](#) did remote video work on seagrass beds for sea turtle foraging. Lots of fish through those stationary plots. May be useful.

We will also have the BRUV data within seagrass beds

Similar to fish surveys to RVC surveys we can combine BRUV data with Global Fingerprint, which focuses on forereefs

**CP:** Are you looking at carry capacity of seagrass communities?

**AH:** We will be able to assess populations on reefs and based on those data, identify how much seagrass those fish will be using.

**RB:** Transient species with FACT database, migratory sharks use what habitats given the seascape configuration. This would be beneficial to managers because identifies migratory fishes that use habitats.

**AH:** Good idea – the new FACT visualization tool we can make use of to get a broader sense of which fish are using our study areas.

**CP:** Habitat quality and associated or adjacent habitats is very interesting. Can you consider as reefs degrade how does that influence fish foraging and habitat use?

**AH:** Right now, we are focused on abundance change rather than behavioral change that is harder to quantify, however the question of how degradation effects abundance and foraging behavior is important as this is a very real future scenario for FL reefs. We will consider for future work

We can also look at how restoration affects abundance. For example, Mission iconic reefs will increase fish abundance and we should consider how that might impact foraging behavior.

**DM:** Will you be able to assess the effects of temperature on energetics?

**MM:** Yes, the student working on the respirometry will be testing at baseline temperature and also at an elevated, “future”, temperature. Thus, we will be able to assess the impacts of higher temperatures on oxygen consumption and metabolic rates and the relationship with activity level.

**AH:** Key Largo to Mote represents a natural temp gradient we can possibly consider, as well as seasonal differences.

**CP:** How long is each array in place?

**AH:** Full array will be in place for at least a year. We will leave a smaller array in place longer (V16a tags are active for ~3 years)

**CP:** How many total tags do you have support for? Why not go out and re-tag in same place?

**AH:** 15 tags x 4 species x 3 boxes = 180 tags. Tradeoffs, but with multiple sites we will have a seascape covariate and cover biophysical gradients from upper keys to lower keys.

**CP:** Change in latitude, season, and location, might be hard to compare sites.

**AH:** Yes, tradeoffs in experimental design. We will have to incorporate these things into our modelling and the covariates

**DM:** Next meeting in the Fall 2023, will we get any updates in between?

**AH:** Yes, we will provide ad hoc updates

**CP:** How did the first meeting go?

**AH:** Good, for example highlighted outreach opportunities linking into Mission Iconic reefs – we are hopeful to connect our work with that.

**MM:** There was some discussion about manipulative components of the project (which we do have with a mesocosm experiment, exclusion experiment, and the respirometry). Also, some questions about scaling from study area to broader Keys or Caribbean.

**AH:** We can make recording and meeting minutes available. Thank you!

