Post fieldwork report for the Alice McCosh Trust, Natasha Phillips.

July 2015

Introduction & aims:
My field season in Italy was generously funded by the Alice McCosh Trust & aimed to provide access to rare, large numbers of ocean sunfish in order to: 1) Determine the swimming costs of sunfish allometrically using data loggers on a self-releasing harness system, & 2) identify & quantify sunfish diet via non-lethal stable isotope analysis (SIA) sampling of mucus & blood.

Summary of fieldwork:
Despite detailed catch records showing hundreds of sunfish caught each year, the 2015 summer season had the lowest numbers in living memory. During our field season (planned to coincide with peak sunfish bycatch), we encountered 1 sunfish; however we have successfully collected accelerometry data along with full measurements & tissue samples from this individual. Following this success, we have arranged data sharing with Japanese researchers of sunfish accelerometry data that has not been previously analysed, which will provide sufficient data for me to address Objective 1. The sunfish tissue samples & measurement data will be used alongside extensive samples of local species also collected during this field season, & previously collected sunfish samples from the area, to consider the ecosystem structuring of the region which will answer Objective 2. We have arranged for an extra field season in 2016, & if the sunfish return I will go back for additional data collection.
In summary therefore, this field season has been a success in that I have collected a huge amount of data on background species in order to assess the local ecosystem & to analyse sunfish diet, we have proven the success of the newly designed self-releasing harness system & I have collected full measurements, weight, tissue samples & accelerometer data from the sunfish we encountered. In light of the unusual conditions & lack of sunfish encountered this year, I now plan to expand my study to mathematically model the abundance of sunfish against the local water & weather conditions over the past 10 years, to assess the primary drivers of their appearance in this area of the Mediterranean.

Benefits:
This research trip has provided huge benefits for my personal development & research, from deploying bio-logging equipment, handling fish, collecting SIA samples, tracking equipment at sea & satellite telemetry. The project has also provided data essential for my PhD including rare accelerometry data from wild fish & all my background samples for diet & trophic analysis. We intend to publish several papers on the outcomes of this work: 1) A methodological paper outlining the use of the self-releasing harness systems to attach bio-logging equipment to pelagic fish, 2) Allometric swimming costs of ocean sunfish, using data collected from Italy, Japan & Ireland, 3) Sunfish diet & habitat use, using data collected from Italy, Japan & Ireland, 4) A methodological paper describing the use of non-lethal techniques to take isotopic samples from pelagic fish using blood, mucus & skin.

Publicising such findings beyond scientific journals is an essential part of academia & I hope will benefit others, so I have been using twitter (@SunfishResearch) & blogging (sunfishresearch.wordpress.com) to disseminate my findings. The charismatic nature of sunfish has attracted international broadcasters, & during this field season we

worked with Discovery Channel filming a mini-documentary on our work. This was a wonderful opportunity to engage with an international audience which we hope will be well received. At present, I have little experience of media engagement so this project can help me develop these core skills. I was also invited to discuss my research with a journalist & the resulting article was published in the local paper.

The data collected & the collaborations created have allowed us to be of use to our Italian partners, where our research into diet & habitat-use will enable fishermen to increase their efficiency by minimising bycatch. This will allow the fishery to adhere more effectivity to MPA guidelines. Also our new modelling study to understand sunfish abundance will help the fishermen predict future numbers from local climate variables. This will help them prepare for high abundance events & prevent additional bycatch. Additionally we will be well placed to assess whether potential future sunfish fisheries will have knock-on effects on other local species.

Conclusion
I believe that this year's field work, although not producing as many sunfish as hoped, has been a success, providing essential data to address my primary aims, along with proof of concept for novel sampling techniques, providing vital material for my PhD thesis & which we aim to publish in scientific journals. The reduced number of fish this year has also given rise to a new study chapter, to mathematically model sunfish abundance with local conditions, which will be of great use to the fishermen. I am very grateful for the generous support of the Alice McCosh Trust which has helped me with travel expenses. I have also attached an additional page of photographs which may be of use in illustrating the project.

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Pesci luna, questi sconosciuti:
a Portofino scatta un'indagine

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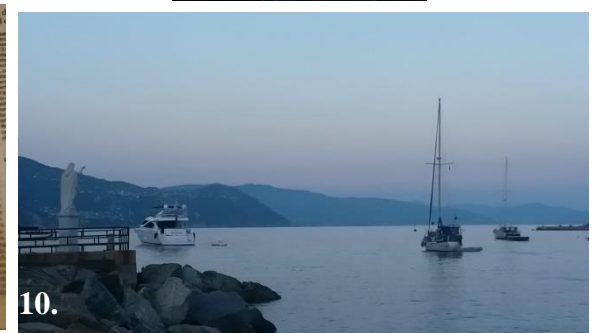
1. Fishing grounds, 2. Dr Houghton (supervisor to project) & I with sunfish, 3. The sunfish harness, 4. Searching for harness after self-release, 5. Dr Payne (visiting researcher) searching for harness, 6. My Discovery Channel interview, 7. Camogli port, 8. The sunfish again, 9. Local newspaper report, 10. Port of Santa Margherita Ligure (MPA)