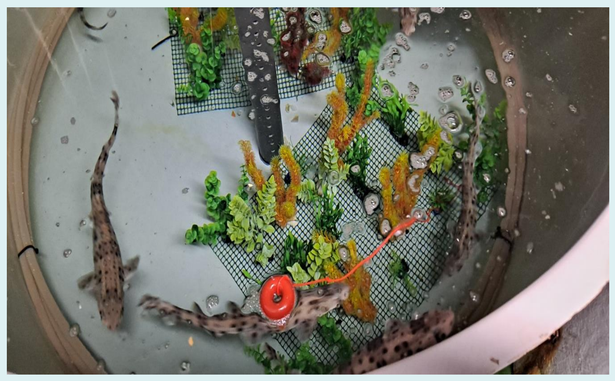
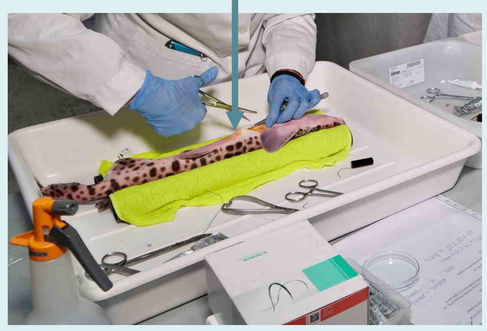
Beyond Stellaris action: Assessing reintroduction success of nursehounds raised in captivity using acoustic tracking

J.M. Valencia[1,2], M. Vanrell[1], E. Aspillaga[3], A . Grau[1,2], P. Archavala[3], J. Alós[3].

1. LIMIA-IRFAP, IRFAP, CAIB, Unidad Asociada al CSIC por el IMEDEA, Av. Eng. Gabriel Roca, 69, 07157-PORT D'ANDRATX (MALLORCA) Instituto Mediterráneo de Estudios Avanzados, IMEDEA, CSIC-UIB, Miquel Marques 21, 07190, Esporles, Illes Balears, España
2. Instituto de Investigaciones Agroambientales y de Economía del Agua (INAGEA) (INIA-CAIB-UIB), 07122 Palma de Mallorca, Balearic Islands, Spain.
3. Fish Ecology Group, Instituto Mediterráneo de Estudios Avanzados (IMEDEA-CSIC/UIB), Mallorca, Spain.



1.- Environmental enrichment group



3.- Surgical implantation of a transmitter.

2.-Non environmental enrichment group: One or two weeks later.

Introduction

The Small Sharks project aims to establish the foundation for a reproduction and reintroduction program for the endangered shark species large-spotted dogfish, *Scyliorhinus stellaris*. As part of this initiative, once breeding techniques are refined, nursehound sharks will be studied to understand their fundamental biological parameters: growth rates, blood biochemical composition, environmental enrichment, physiological stress, genetic variability and more. Additionally, an initial acoustic tracking experiment has been conducted (refer to the "Nursehound tracking" poster).

In this poster we introduce the GenAliTrack project, that seeks to determine whether juvenile large-spotted dogfish sharks, raised in captivity exhibit innate habitat preferences or if exposure to environmental enrichment over a six-month period alters these preferences. We will address this question by performing an acoustic tracking experiment in the waters of the Balearic Islands. Additionally, the project will examine whether environmental enrichment in captivity influences dispersion parameters.

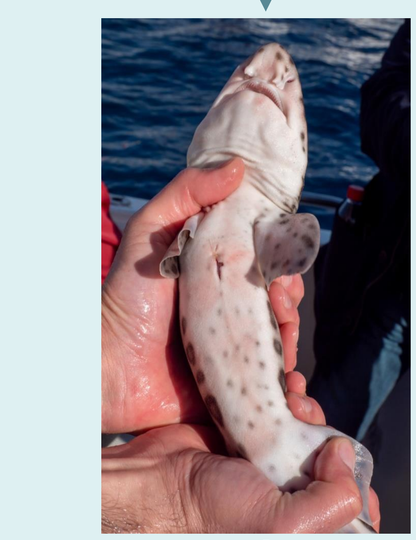
This work will ultimately contribute to improving reintroduction programs for this threatened species and contribute to conservation efforts.

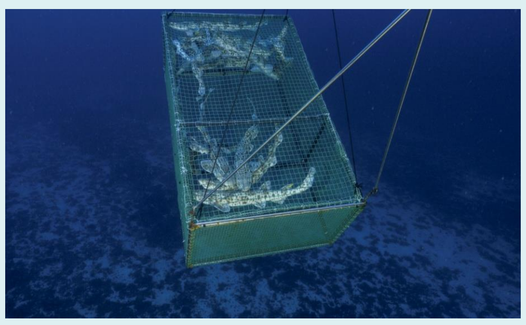
Material and methods

From each treatment group (those with environmental enrichment, including plants and shelters (**1**), and those without enrichment(**2**)), 10 to 30 individuals will undergo surgical procedures for the implantation of a Thelma Biotel emissor device (**3**). The group originating from environmental enrichment will be released in the Cap Enderrocat Marine Reserve after a 2-3 day acclimatization period in a cage on the seabed (**4**).

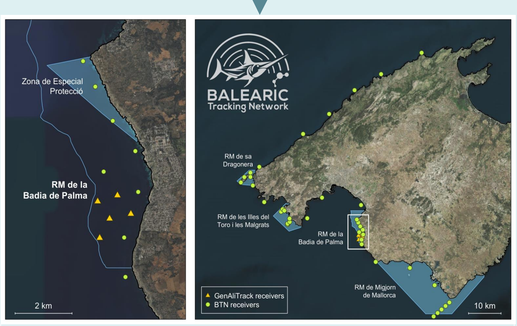
One week later, the same procedure will be conducted with individuals from the group lacking environmental enrichment.

Data will be collected using the Balearic Tracking Network over a minimum period of two months (**5**). Detection data from receivers will be downloaded using the WHS Host software (Lotek Wireless Inc.). The positions of transmitters will be estimated from the signals that will be simultaneously detected by three or more receivers and will be applied the hyperbolic multilateration algorithm implemented in the UMAP software (Lotek Wireless Inc.). All the estimated positions will be then imported to the R computing environment (R Core Team, 2020), where all the data pre-processing and analyses will be conducted, and the acquired data will be processed accordingly.





4.- Acclimatization in a cage on the seabed



5.- Display of Balearic Tracking Network receivers

Hypothesis to be tested

1.- Nursehound reared in captivity with environment enrichment are less stressed those raised without environmental enrichment. We expect that the dispersal of the former when released will be lower than that of those raised without environmental enrichment.

2.- Generally, individuals remain inactive within the refuge during the day prior to leaving to go on nocturnal or crepuscular foraging excursions (Sims et al., 2005). We hope to confirm this behavior and see if there are significative differences between groups.

Other information to be adquired (long term):

1.-General movements

2.- Habitat preferences

3.-Home range

4.-Migrations

References

1) R Core Team (2020). R: A Language and Environment for Statistical Computing. Vienna: R Foundation for Statistical Computing.
2) Sims, D. W., Southall, E. J., Wearmouth, V. J., Hutchinson, N., Budd, G. C., & Morritt, D. (2005). Refuging behaviour in the nursehound *Scyliorhinus stellaris* (Chondrichthyes: Elasmobranchii): preliminary evidence from acoustic telemetry. JMBA-Journal of the Marine Biological Association of the United Kingdom, 85(5), 1137-1140.

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BALEARIC Tracking Network www.trackingfish.com

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