Mapping the population diversity of the lined seahorse, *Hippocampus erectus* through citizen science

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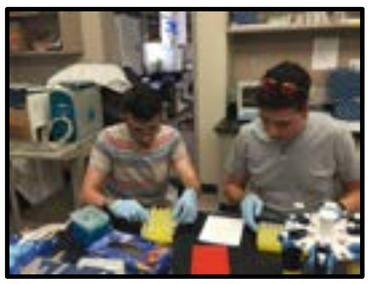
Introduction

The lined seahorse, (*Hippocampus erectus*) is one of the three seahorse species found in the United States. All seahorses are monitored by CITES and the lined seahorse is considered vulnerable. Because of this, a Species Survival Plan (SSP) Program has been put in place to ensure a sustainable, healthy and genetically diverse captive population. This popular aquarium species gives us the opportunity to influence aquarists, hobbyists, and the public to participate in a citizen scientist driven study in mapping out its genetic diversity along the United States eastern and Gulf Coast.

Purpose & Significance

- Contribute to the scientific community's knowledge regarding seahorse genetic diversity along the eastern coast of the United States.
- Crowdsource wild seahorse sightings by developing seahorse outreach programs
- Collaborate with zoos and aquariums to promote joint research efforts
- Update the IUCN Red List assessment for the lined seahorse

Methodology



1. Launch workshops and summer programs to inform the community about conservation genetics

2. Establish a network of partners to collect photos of seahorse sightings and/or fin tissue

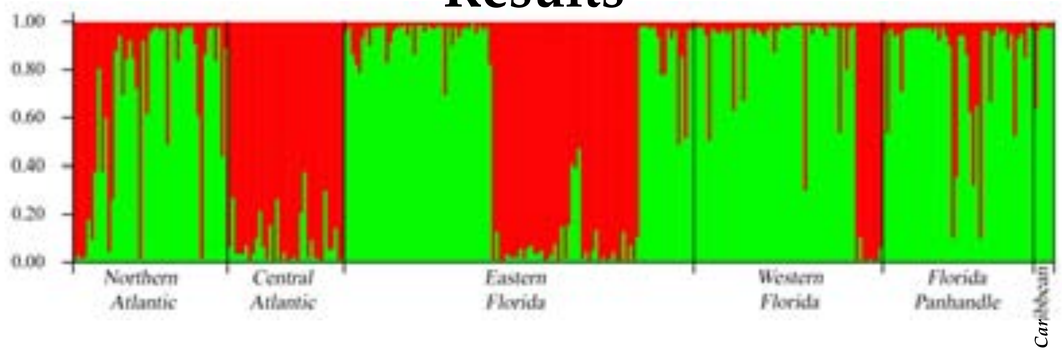
3. Extract DNA from seahorse tissue using a chemical recipe

4. Multiply a specific region (microsatellite) of the DNA and send the regions to another lab to read the sequences.

5. Receive electronic files with DNA codes of each microsatellite for every seahorse sample

6. Upload the DNA codes and inform partners of results

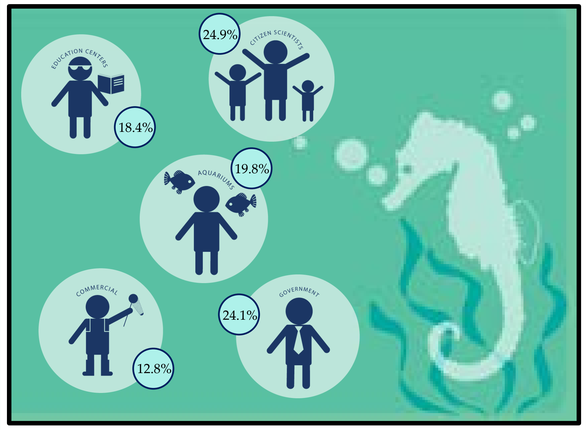
Results



A STRUCTURE analysis identified 2 populations (K = 2). Each vertical bar represents a seahorse, and the proportion of the bar represents the probability of that seahorse belonging the one of the two populations. Many individuals have high probabilities of belonging to either the "red" or the "green" population. Untied States Central Atlantic consisted of only high "red" probability individuals and suggests a unique population in that region, while the other locations have mixed populations.

Citizen Science

Since 2013, we have archived 445 seahorse samples from various sources.



Discussion

We learned that through peaking the interest of the public we are able to gather more information about a species of concern, whether it is for the purpose of contributing to a database, or to conservation ideas and efforts. For our future efforts we hope to continue collecting tissue samples from wild seahorses in order to continue to assess this population and upload sightings via iSeahorse.

iSeahorse

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