CALIFORNIA SCIENCE & ENGINEERING FAIR
2018 PROJECT SUMMARY

Name(s)

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Project Number

38210

Project Title

Escaping Boats, Wasting Calories: Otter Disturbance in Elkhorn Slough

Abstract

Objectives/Goals

We set out to determine the energetic cost for the Southern Sea Otter foraging in Moss Landing Harbor channel, a location with increased boat disturbance. This entailed answering 3 questions: 1. How do dive times differ between sea otters that are foraging versus sea otters that are escaping from a disturbance? 2. What is the success rate of foraging? 3. What prey do sea otters eat in the Moss Landing harbor channel.

Methods/Materials

We observed southern sea otters in the Moss Landing Harbor Channel. We recorded the dive-surface times of individual sea otters. With foraging sea otters, we recorded whether the otter was successful or not and what their prey consisted of. With otters escaping from a disturbance, we recorded the dive time and the type of disturbance.

Results

The average dive time for a foraging sea otter was 64 seconds and for escaping sea otters 54 seconds. Otter success rate of foraging dives was 62% successful and 38% unsuccessful. Sea otters foraged on 55% bivalves (clams and mussels) 37% fat innkeeper worms, and 8% fat innkeeper worms and bivalves (in the same dive). 27% of dive time was used to escape boats. Otters spend about 6 kcals diving to achieve one food item.

Conclusions/Discussion

The average calories gained for 1 clam is 40 kcals. The cost to get this clam is 2.7 kcals for the successful foraging dive but since only 45% of total dives (disturbed + foraging successful + foraging unsuccessful) result in a clam the cost to get this clam is 6 calories. The energetic cost of foraging in the channel is relatively low. However, as boat traffic increases or food abundance decreases, the cost of foraging in this channel may become too high. Fat innkeeper worms are not a common food source for otters outside Elkhorn Slough. More information is needed on the quality of their nutrients and their abundance in this area.

While observing, we could see that sea otters are not easily disturbed by boat vessels. This is especially apparent with kayakers. However, otters do dive to escape disturbances caused by boats coming too close and by noisy motors or large wakes. Boat captains can reduce otters# energetic expenditure by slowing down, moving away from otters and decreasing the noise generated by boat motors

Summary Statement

We found that Southern Sea Otters foraging in Moss Landing Harbor channel spent about one quarter of all dive time escaping boats, costing about 6 kcal for each successful forage attempt.

Help Received

We consulted with Dr. Terrie Williams about the energetic cost of diving in sea otters but designed and performed the entire study ourselves.

Preliminary