Bird interactions with novel oyster reef restoration materials using wildlife trail cameras

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Background

- Estimated 24% loss of eastern oyster reefs (Crassostrea virginica) in Mosquito Lagoon (ML) since 1943.9
- Declines due to boat wakes, habitat loss, and invasive or pathogenic species.

Oyster reef loss reduces habitat availability for resident and migrating birds.

- Restoration efforts focused on increasing oyster populations and bird habitat in ML.

Novel biodegradable restoration materials include cement-jute rings/tiles and Biodegradable Ecosystem Engineering (BESE) mats made from potato starch and recycled oyster shell.

Methods

- Bushnell Trophy Cam HD Model 119876 trail cameras were placed at 15 oyster reefs in Mosquito Lagoon between May and August 2021.

- SD cards and batteries replaced every two weeks.

- Control reefs: Dead and Natural, Reference Reefs.

- Each camera set to record 10-second intervals when it detected motion.

- Collected cameras and analyzed footage to identify bird behaviors and interactions.

- 6,109 out of 27,416 video clips were occurrences of bird, boat, or human activity.

- 26 bird species, 3 mammal species, and humans were identified.

- Animals visited dead reefs the most, cement rings the least.

- Most common birds observed were great blue heron and white ibis.

- 2% of behaviors were direct interactions with the materials.

Results


- 3 mammal species observed: otters (14% of observations), dolphins (4%), and racoons (82%).

- Most common behaviors were loafing, foraging, and material interactions.

- Most common human behavior was material interactions from oyster monitoring and camera set-up (n=1546).

Discussion

- Most bird interactions with materials indicated minimal avoidance or little interest in them.

- Loafing was the most common bird and mammal behavior. This suggests material presence does not deter birds from reefs.

- Cement ring sites had the fewest animal and human interactions. This may be because they were submerged most of the time and had the smallest footprint.

- Most human interactions with materials were from volunteers helping with restoration set-up, monitoring, and recreational activities.

- Future studies on restoration interactions should focus on whether migratory, rare, or endangered species interact with materials. This is crucial in determining whether these novel materials are viable long-term solutions for oyster restoration.

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References