

Monterey Bay National Marine Sanctuary

Unmanned Aircraft Systems

Management Issue

There is a need to assess the impacts of Unmanned Aircraft Systems (UAS) on wildlife, including species sensitivity, geography, UAS size, noise level, flight altitude, and time of year.

Description

Studies indicate that use of UAS can negatively affect species in a variety of ways, including flushing, abandonment of nests, and disruption of natural behavior. However, some species are not impacted, affording opportunities for effective use of UAS for valid management, research, and education purposes.



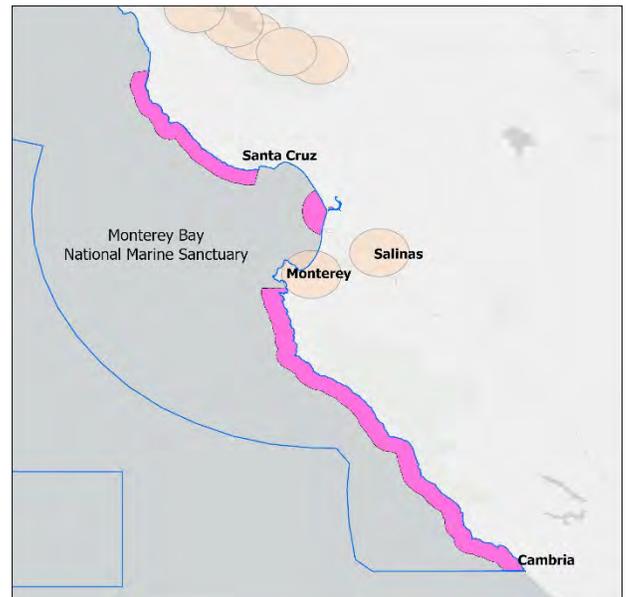
UAS are commonly referred to as “drones,” and come in a variety of shapes, sizes, payloads, range, noise levels and more. (Photo: NOAA)

Questions and Information Needs

- 1) What are the locations of all current zones restricting or prohibiting drone flights, and what national, regional, and local ordinances and permit requirements apply within each zone?
- 2) Which species are disturbed by sound and/or visual sight of a UAS and what constitutes disturbance (by species)?
- 3) How loud must the noise be to disturb a species of concern?
- 4) How do size, shape and color of the UAS impact species of concern?
- 5) Do species or individuals within species become habituated to different sizes and shapes of UAS (e.g., does location and history matter)?
- 6) Which species are more vulnerable to UAS impacts during particular times of the year (e.g., nesting, breeding, seasons)?
- 7) Can operations criteria be developed to allow UAS use while avoiding wildlife disturbance?

Scientific Approach and Actions

- Develop comprehensive maps of all restricted and prohibited drone operating areas established by national, regional, and local governments, such as FAA, NOAA, California State Parks, and individual municipalities (e.g. Pacific Grove).
- Continue workshops that bring local, state and federal agencies together to make connections in the community and to coordinate best practices and permitting (e.g., One Monterey area workshop was held on December 12, 2019. Next UAS workshop scheduled for end of June, 2020).
- Conduct experimental studies to assess the impact of UAS on species of concern.
- Gather data from observations and monitoring of permitted activities to determine effectiveness of permit conditions in limiting or eliminating incidental negative impacts to wildlife by authorized drone operations.



Map of FAA restricted airspace and NOAA regulated overflight zones affecting drone operations in Central California. Circles represent FAA airport proximity restrictions. Pink bands represent NOAA 1,000 ft minimum altitude overflight zones within MBNMS.

Updated: 04/06/2020

For More Information -- <http://www.sanctuaries.noaa.gov/science/assessment>

Potential Key Partners and Information Sources

Monterey Bay Aquarium Research Institute, Moss Landing Marine Labs, Monterey Bay Aquarium, National Centers for Coastal Ocean Science, National Marine Fisheries Service, University of California Santa Cruz, Elkhorn Slough National Estuarine Research Reserve, Office of National Marine Sanctuaries, City of Pacific Grove, California Department of Fish and Wildlife, California State University Monterey Bay, Ocean Protection Council, The Nature Conservancy, Stanford University, San Francisco Estuarine Institute, National Park Service, US Fish and Wildlife, Bureau of Land Management's California Coastal National Monument, Bay Net, and Central California Black Oystercatcher Project.

Management Support Products

- Biological, ecological and behavioral characterization
- Site characterization document
- Wildlife disturbance data sheet for field monitoring by MBNMS staff.

Planned Use of Products and Actions

- Inform permitting decisions.
- Inform drone-users of flight restrictions and allowances.
- Increase understanding through characterization and impact studies.
- Develop wildlife disturbance education materials.
- Collaborate with partners to inform stakeholders of mitigation measures to reduce UAS impacts.

ONMS Program References

MBNMS Management Plan

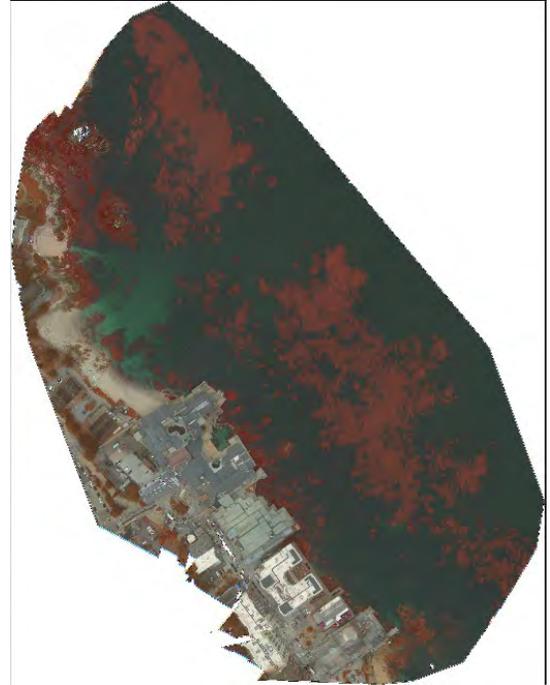
- Wildlife Disturbance Action Plan
- Resource Protection Action Plan
- Research & Monitoring Action Plan
- Marine Spatial Planning Action Plan

MBNMS Condition Report

- What are the states of influential human drivers and how are they changing? (Question 1)
- What are the levels of human activities that may adversely influence habitats and how are they changing? (Question 3)
- What are the levels of human activities that may adversely influence living resources and how are they changing? (Question 4)
- What is the status of keystone and foundation species and how is it changing? (Question 12)
- What is the status of other key species and how is it changing? (Question 13)
- What is the status of non-indigenous species and how is it changing? (Question 14)
- What is the status of biodiversity and how is it Changing? (Question 15)

ONMS Performance Measures

- 3.2 Measuring Habitat Protection Performance
- 3.3 Measuring Living Marine Resources Protection Performance
- 3.9 Measuring Marine Zones Performance



Mosaic of photos taken by a drone for a kelp canopy study near Hopkins Marine Station in Pacific Grove, CA. Photos by Meridith McPherson, Kudela Lab, UC Santa Cruz.

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