RESOLUTION of the
Greater Farallones National Marine Sanctuary Advisory Council

To support staff recommendations within the Sandy Shores Topic Briefing

At its meeting on February 29, 2024, the Greater Farallones National Marine Sanctuary Advisory Council suggested edits to the staff recommendations within the Sandy Shores Topic Briefing. The council passed a resolution to support the staff recommendations with the suggested edits.

Attachments: Sandy Shores Topic Briefing

This resolution was passed with majority vote by a quorum of primary members (or alternate members serving in place of primary members) at a public meeting on February 29, 2024 held in San Francisco, CA and via Google Meet. Council discussion regarding this resolution can be found in Meeting Highlights documentation at https://farallones.noaa.gov/manage/sac_meetings.html.

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Briefing on Sandy Shores in Greater Farallones National Marine Sanctuary

Note: Some sandy beach inhabitants (e.g., shorebirds) were captured in other topic briefings

State of the Resource

Condition Report Data (in preparation)

- The total length of sandy beach ecosystems within GFNMS boundaries is approximately 55.43 statute miles.
- Natural erosion and deposition along sandy beaches at GFNMS have changed because of historic alteration of sediment supplies caused by modification of watersheds and coastal armoring, combined with climate impacts (Kordesch et al., 2019).

Other Science Information

- The majority of beaches in GFNMS are experiencing erosion that threatens beach and dune ecosystems.
- Modeling estimates that, without interventions, 24%–75% of California's beaches may be completely eroded by 2100 due to future sea-level rise scenarios of 1 to 3 m respectively.
- More research is needed that considers a systems-based approach to work towards a broader understanding of natural sediment transport processes on a regional and watershed scale. Additionally, more studies on specific sediment source/sink estimates would provide more reliable estimates of sand budgets and resulting understanding of accretion/erosion at a given coastline.

Climate Vulnerability Assessment Findings

- Sandy shores have moderate-high vulnerability and were identified as one of the most climate-vulnerable ecosystems due to projected increases in inundation, erosion, and ecosystem loss (Hutto et al., 2015). Sandy shores have moderate-high sensitivity driven by sea level rise, increased wave action, increased erosion, changes to sediment supply and movement; and development (e.g., roads and structures). Sandy shores have moderate current exposure to non-climate stressors, primarily due to coastal infrastructure and development, and high future exposure to climate stressors, including sea level rise, increased waves and erosion. adaptive capacity for sandy shores is moderate based on geographic extent, ecosystem integrity, and ecosystem continuity.

Pressures on Sandy Shores

- Climate change (primarily sea level rise and storm surges, resulting in inundation and erosion)
- Sediment transport imbalances (erosion and accretion)
- Hardened shorelines (roads and coastal infrastructure)
- Vessel groundings

Summary of Relevant Regulations

The following GFNMS prohibitions can prevent impacts to sandy shores from listed prohibited activities:

1. Discharging or depositing from within or into the Sanctuary any material or other matter.
2. Discharging or depositing, from beyond the boundary of the Sanctuary, any material or other matter that subsequently enters the Sanctuary and injures a Sanctuary resource or quality.
3. Constructing, placing or abandoning any structure, drilling into, dredging, or otherwise altering the submerged lands of the Sanctuary.
4. Deserting a vessel aground, at anchor, or adrift in the Sanctuary.
5. Leaving harmful matter aboard a grounded or deserted vessel in the Sanctuary.

See links to full text, definition, exceptions, and exemptions on the regulations pages of the GFNMS website.

Summary of Relevant Sanctuary Projects

Conservation Science

- Since 1993, the sanctuary, in partnership with the Greater Farallones Association, has implemented the Beach Watch project. Volunteers survey 50-plus beaches from Manchester Beach in Mendocino County to Point Año Nuevo in San Mateo County and collect data on live, dead, and stranded seabirds and marine mammals, as well as human activities, oil pollution, the status of stream openings and closures, kelp wrack, and other beach conditions.
- The Long-term Monitoring Program and Experiential Training for Students (LiMPETS), a GFNMS and GFA partnership, collects data at 14 sites in GFNMS focused on the abundance, seasonality, and demographics of mole crabs.
- Sediment science in the sanctuary assesses long-term coastal change at erosion 'hotspots' to understand the impacts of storm flooding and sea level rise inundation and identify nature-based solutions to address impacts to shoreline ecosystems.

Resource Protection

- GFNMS reviews project proposals, including proposed actions from other agencies, that could potentially violate sanctuary regulations and cause sediment imbalances.
- Through permitting actions GFNMS manages, reduces, or eliminates impacts from research, education and management projects to sandy shores.
- GFNMS works with NOAA's Office of Law Enforcement to document potential violations, such as grounded vessels or illegal construction and enforce regulations that protect sandy shores.
- GFNMS is uniquely positioned through our geography, management jurisdiction that includes Monterey Bay National Marine Sanctuary north of Ano Nuevo, and through our regulations and mandate under the National Marine Sanctuaries Act to facilitate project considerations of land-sea connections to address sediment imbalances and restore ecosystems in an ecologically beneficial manner.

    - GFNMS has identified sediment imbalances in the sanctuary's boundaries and coordinates collaborative, multi-agency sediment management actions within the sanctuary.
    - GFNMS has identified areas that need human intervention to restore natural sediment transport and lost ecological functions of sandy shores and restore natural ecosystems and/or sediment dynamics, while pursuing nature-based solutions to avoid hardening shorelines.
    - GFNMS leads a permit agency forum to support planning for sandy ecosystems living shoreline projects to facilitate the regulatory process and accelerate coastal adaptation projects.
    - GFNMS encourages the beneficial reuse of clean sediment and uses a holistic, watershed approach to sediment management.

Education and Outreach

- Community programs:
    - Family Workshops, community partner workshops
    - Sanctuary Explorations
    - Community lectures
    - Sanctuary Soirées
    - Marine Explorers Camp: Beach Activities (3rd-6th grade)
    - Sanctuary Naturalist Program training includes beach ecology lessons (sand lab and interstitial investigations) and a beach chapter in the Manual
- Exhibits and signs
    - Crissy Field Sanctuary Visitor Center
    - California Academy of Sciences, California Coast Exhibit
    - Bear Valley Visitor Center at Point Reyes National Seashore: sandy beaches
    - Oakland Museum of California, Cordell Gallery includes additional coastal exhibit cases about sandy beach ecosystems
    - Randall Museum, Ocean Habitat Exhibit
    - Signs: San Mateo, Sonoma county, Point Reyes beaches
- Media & outreach activities:
    - Digital media & social media on beaches ("Marine Life Mondays")
    - Collaboration with the International Ocean Film Festival include Beach Watch film and participation in panel discussions
    - KWMR Radio Shows and recorded podcasts on beach ecology
    - Web stories, videos, press releases
- School Programs
    - GFNMS Visitor Center Field Trips: beach access for beach hopper, mole crab, seaweed (wrack), birding programs.
    - At Your School Programs: Crab Cab (for mole crabs and shore crabs are at the sandy/rocky interface)
    - Ocean Afterschool Programs - mole crabs, shorebirds, but there isn't a formal sandy beach module.

    - LIMPETS - sandy beach monitoring
    - Teacher Professional Development workshops

Infrastructure and Vessels:
Sanctuary infrastructure supports sandy shore projects by providing office space, and administrative, logistical, and operational assistance.

- Meeting spaces for staff and partner collaboration on sandy shore projects and storage for field equipment.
- Crissy Field Visitor Center as a space to deliver sandy shore programs and educate teachers and the public about sandy shore ecosystems through exhibits and intertidal aquariums (sand crabs).
- GIS support to map sandy shore ecosystems, to conduct spatial analysis, and produce educational products.
- Government vehicles for transportation to and from sandy shore field sites for monitoring and education projects.

Summary

GFNMS and CBNMS Advisory Councils Recommendations

These recommendations were provided during a joint GFNMS and CBNMS Advisory Council meeting on February 29, 2024. To view council discussion on this topic, please visit https://farallones.noaa.gov/manage/sac_meetings.html and view the meeting's highlights

Conservation Science

- Continue to monitor and expand projects on sandy beach ecosystems to track status and trends, identify issues and potential violations, and provide data to assess the success of management actions and inform management on the health and trends of the sandy beach ecosystems . Improve our ability to understand and track sediment dynamics to inform sanctuary management on impacts to sandy shore ecosystems .

Resource Protection

- Continue to review project proposals, including proposed actions from other agencies, that could potentially violate sanctuary regulations and cause sediment imbalances and issue permits that manage, reduce, or eliminate impacts from research, education and management projects to sandy shores.
- Continue to document potential violations, such as grounded vessels or illegal construction, and support enforcement to build cases that protect sandy shores.
- Continue to lead regional efforts and serve as a model for other regions to protect sediment resources and address sediment imbalances, including: 1) coordinating collaborative, multi-agency sediment management actions; 2) identifying where human intervention is most effective in protecting sandy shore ecosystems and associated ecological processes; 3) facilitating a permit agency forum to support project planning for living shorelines on sandy shores; and 4) increasing the beneficial reuse of clean sediment and using a holistic, watershed approach to sediment management.

- Adding in the exclusion zone to protect more sandy shore ecosystems
- Identify sources of funding to enhance beneficial reuse of sediment

Education and Outreach

- Continue inclusion of sandy beach ecosystems in sanctuary education and community programming and increase communications about resilience and adaptation planning and the importance of sandy beach ecosystems.
- Education outreach regarding the permitting process and why
- Continue and explore increased collaborative educational efforts to educate boaters about responsibility and liability for vessels that come ashore in the GFNMS and other respective laws.
- Pursue potential collaboration with community college and other undergraduates with internships to support the next generation
- Broaden areas of education to include city staff along sandy shore ecosystems
- To partner with organizations on incorporating traditional ecological knowledge on sandy shores and promote sanctuary relationships with traditional knowledge communities
- Establishing a volunteer education and outreach group to support education and outreach
- Create best practice guidelines for outreach and inclusion for docents and volunteers for sandy shore ecosystems (including outreach about pinniped use of shorelines)
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Administration, Operations and Infrastructure:

- Maintain meeting space, storage and offices in San Francisco and Point Reyes Station to facilitate collaboration among staff and with partners.
- Ensure access to advance technology and provide spatial analysis, to include future modeling for inundation and sediment monitoring to support for sandy shore protection at a high enough resolution to look at patterns over time of individual beaches
- Expand and update the Crissy Field Visitor Center to:
  - enhance the sandy shore ecosystems exhibit,
  - create space to train teachers how to monitor sandy shore ecosystems , and,
  - to deliver student and public education programming on sandy shore ecosystems so that the public understands the importance and how to be stewards of sandy shores.
- Maintain vehicles and field equipment so staff can access sandy shore sites to conduct monitoring and education programming.
- Ensure our team has access to advanced technology to create a comprehensive record of how these important ecosystems are changing.
- Maintain and explore additional agreements with partners that enable rapid response to incidents that impact sandy shore ecosystems