# Forest Restoration & Preservation At Lanphere Dunes Humboldt Bay National Wildlife Refuge

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### Geography

The Lanphere-Christensen Unit of the Humboldt Bay National Wildlife Refuge (HBNWR) is a coastal marsh interface forest located at approx 7 ft. above sea level and directly adjacent (eastward) to large parabolic sand dunes on the Pacific coastline of Northern California. The Humboldt Bay is encompassed by many sand dune formations, some which are moving over forests. The Lanphere Unit is a forest that is changing constantly, more in due to nature than humans. It has many varieties of plants that coexist together, thriving off the wet interface between the marshes of the bay (Mad River Slough) and the Pacific Ocean. Those who choose to visit it often refer to it later as an "enchanted forest." Public tours are offered for those who wish to see the Lanphere Unit, and access is limited to research and environmental restoration. The access trails that were once open to the public are now closed, and the road to the main trailhead is blocked. Many choose to hike along the coastline to the forest. There are signs that explain the area is a protected wildlife refuge, and the dune vegetation is being actively restored.

#### Environment

The Northern California coastline is known for its temperate and moist environment. Low fog layers are common in the night, and effectively insulate the ground and allow for the growth of moss and ferns on sand. Humidity is relatively constant with most of the precipitation occurring in the fall. There is still some freshwater flowing from the Eastern Mad River Slough, which helps to reduce salt in the groundwater below the dunes and provide minerals for the growth of both conifers and broad leaf trees. Since levees now block the Mad River and redirect it north, it does not create the same buffer, though many plants thrive in the salt marsh.

The dunes tower above most of the forest and block most of the wind, but continue to move over the trees. Recent storm damage has blown over many of the tallest trees, and plants are drying out in the sunlight. The mosses and roots help to retain the integrity of the sand and reduce erosion, as do the trees, but the loss of the forest canopy has caused desert-like conditions in some areas of the forest. The loss of trees is the loss of bird habitat as well. The forest was once much larger, and is decreasing by many square miles annually. They are west of the dunes and move to the southeast, nearly exceeding the height of most of the trees in the forest. The redirection of the Mad River has also increased land erosion from the east.

#### History

Prior to the 1850's, Native American tribes known to northern California such as the Wiyot, Yurok, and possibly Karuk inhabited the local area and harvested edible plants from the dunes. European settlers flooding in forcefully replaced and relocated the tribes, and yet some of the local geographic names still remain. A massacre occurred on an island in Humboldt Bay, and many natives were slaughtered, likely fleeing from the dunes in canoes as loggers, fisherman, missionaries and miners moved in from the north and south. The Wiyot tribe now resides at Table Bluff, which is approx 15 miles south of the dunes. The area west of the Dune Forest was landscaped, levees were built, and the river was redirected north for agriculture and roads. Luckily, the Lanphere Unit was acquired by Humboldt State professors William and Hortense Lanphere and partially

protected from exploitation until the 1970's. They sold their land to the Nature Conservancy in 1974 (*www.fws.gov/humboldtbay/dunes.html*), which is an organization administered by the U.S. Fish & Wildlife Service (USFWS) and the Bureau of Land Management (BLM). Some logging did occur in the dune forest after the settlers arrived, primarily by Sierra Pacific Lumber and Simpson Timber. Sierra Pacific now owns property within 100 feet of the Lanphere Unit. Additionally, Redwood Gun Club owns property directly adjacent to the unit in an area known for Osprey hunting and nesting. Currently, the Humboldt Bay National Wildlife Refuge manages the entire Humboldt Bay and is discussing recreational access routes for the Lanphere Dunes.

#### **Dune Forest Management/Restoration**

The area is relatively isolated, and it many bird species nest in the area. However, the Sierra Pacific Timber facility and the Redwood Gun Club both have obvious negative effects on the dune environment. The Wiyot Tribe still harvests many berries plants for textiles from the dunes and the Dune Forest, and the abundance of strawberries, blackberries, huckleberries, and Salal berries is still high. The Tribe has expressed its desire to ensure protection of cultural resources and maintain their right to access and gather plant resources traditionally used for food, fiber and medicine. (HWR Engineering & Science, 2008) There are many threatened species of plants and animals in the Dune Forest, but more field research needs to be conducted. The area is known to be a bird sanctuary, and hosts many bird species. This attracts gun enthusiasts whom congregate at the Redwood Gun Club and effectively disrupt bird migrations. Additionally, the Sierra Pacific Lumber Company facility discharges harmful air/water emissions and noise pollution. The Lanphere-Christensen Unit is the last remaining parcel of an entire dune

forest that is entirely unique to California, and found only in one other coastal area in the Pacific.

Currently, the USFWS is monitoring a list of species in the area that are either endangered, threatened, or special status. The HBNWR is actively working with the California Conservation Corps, Friends of the Dunes, and the Nature Conservancy to restore the Dune Forest from damage sustained by storms and the foot traffic of transients & berry pickers. Trails are maintained for access, yet natural barriers are reinforced to restrict wandering photographers and mushroom pickers. Additionally, invasive nonnative species continue to be a problem, such as English Ivy, cotoneaster (*Cotoneaster franchettii*), English holly (*Ilex aquiflorum*), and pittosporum (*Pittosporum tenuifolium*). Most of the active work involves physical removal of invasive plants and consolidating them into compost piles. Agreements have been made to open the Lanphere Unit for access between Ma-le'l and Mad River Beach, and current discussions with the community continue as to how the trails and traffic will affect current residents in Manila. The area is closely monitored by law enforcement for mushroom harvesting and illegal camping.

South of the Lanphere Unit of the HBNWR, the coastal forest is cooperatively managed by the BLM and the USFWS and is known as the Ma-le'l Dunes Cooperative Management Area (CMA). The Ma-le'l CMA consists of two sections the Ma-le'l North and Ma-le'l South areas managed by the USFWS and the BLM, respectively. The two areas consist of four properties—the Manila Dunes Area of Critical Concern and the Khoaghali Parcel (Ma-le'l South) and the Fernstrom-Root Parcel and the former Buggy Club Parcel (Ma-le'l North). (www.duneguide.com) Approximately 38.5 acres of coniferous forest exists at the Ma-le'l Dunes. On May 5, 2005 the EDAW released and environmental assessment draft on the Ma-le'l Dunes restoration. The draft contains a plan of action that focuses on ecological restoration primarily of the dune areas through the removal of invasive plants for the restoration two endangered plant species, the Humboldt Bay wallflower (Erysimum menziesii spp. Eurekense) and the beach layia (Lavia carnosa), and two unlisted sensitive plant species, dark-eyed gilia (Gilia millefoliata) and pink sand-verbena (Abronia umbellate ssp. breviflora), but also includes restoration of coastal forests that have been affected by off-road vehicle use and spread of invasive plant species, specifically English Ivy (*Hedera helix*) and poison oak. (EDAW, 2005) The purpose of these restorations is to allow the natural succession of native habitats, which is crucial to preserving the individual ecosystems present in the area. All biotic and abiotic factors must be put into consideration because the existing ecological succession creates an intricate interconnectedness between the dune, forest, wetland, and estuarine ecosystems. A change in function of one system is likely to cause other effects on the successive zones. These restoration activities would be funded by the CDC and the project would be implemented by the HBNWR.

The restoration of the forest would consist of five acres total. Proposed mechanical and chemical removal of invasive plants was rejected for several reasons. Mechanical methods would be too destructive and invasive to achieve desired restoration, and chemical spraying is too controversial. Two acres have been chosen for English ivy removal by manual hand pulling methods. This process will follow protocol established by Restoration, Management, and Monitoring Plan for Beach Pine/Sitka Spruce Forest

and Red Alder Riparian Forest at the Lanphere Dunes Unit (Clifford 2003). Ivy will be hand removed and dragged out on tarps.

Forest restoration will also include the planting of trees in selected sites. Based on analyses of species composition and structure with comparison to undisturbed areas, seeds will be collected on-site and planted, and young trees growing in dense areas will be directly transplanted to areas needing revegetation. Unofficial trails will be revegetated this way to reduce accessibility and visibility. (EDAW, 2005)

To avoid any disturbance of cultural sites in the vicinity of restoration areas, these sites will be fenced off or otherwise delineated during the project activity. Prior to any initiation of restoration activity, the Restoration Manager will alert all crew members about the possibility of buried cultural resources. If any cultural resources are uncovered all activities will stop until an archeologist reviews the site and determines a proper course of action. (EDAW, 2005)

The Ma-le'l Dunes CMA contains 450 acres is divided into two parcels, the southern portion (*Mal-e'l South*), which is currently open for day use, including hiking and dog walking on trails and open sand areas, and horseback riding on designated trails only, and the northern portion(Friends of the Dunes, 2006) This plan reviews current environmental, legal, and recreational issues, and has proposed adding new trails for access and improving the Ma-le'l North parking area. In consultation with the USFWS and the BLM, the HWR Engineering and Science released the *Final Ma-le'l Dunes Cooperative Management Area Public Access* in March of 2008, which contains the most recent development plan for the Ma-le'l Dunes Cooperative Management Area (CMA).

In consultation with the USFWS and the BLM, the HWR Engineering and Science released the *Final Ma-le'l Dunes Cooperative Management Area Public Access* in March of 2008, which contains the most recent development plan for the Ma-le'l Dunes Cooperative Management Area (CMA). This plan reviews current environmental, legal, and recreational issues, and has proposed new management plans including some alternatives. The proposed plan would include be not be limited to adding 3.5 miles of new trails for pedestrian use, having canoe and kayak accessibility, the installation of a bicycle rack and a potable water spigot, an onsite caretaker, and a reconfiguration of the parking area in the Ma-le'l South day use area. (HWR Engineering & Science, 2008)



#### Maps/Pictures





- We observed and estimated a sand dune velocity of approx 10 feet per year. High winds and drought can cause dunes to cover a small tree in a day.

## **Further Observations**

Residents living in the area have posted signs for traffic to yield in their neighborhood. Tresspassing is an issue with many backyards on the dunes that have no fences. Signs are posted out to notify hikers that insect studies are being conducted under tarps in the forest. The are is very sensitive for a number of reasons, yet continues to attract a crowd of people on a sunny day.

We were able to see the transformation of habitats and environments from a firsthand perspective, and what seems very interesting about the area is the successive ecology that occurs within the different parts of the forest, but also the role that it plays in the layers of habitats that live there such as the threatened dune mat, the dune swale, and the freshwater and brackish marsh. We saw many species of birds including and osprey and an active osprey nest. We also observed a lot of evidence of the shifting dune forest interface. Encounters with management personnel were infrequent.

# Conclusion

The dunes seem to be sustaining more damage by nature than by humans, though contaminated groundwater from agriculture and industry affect the dune forest. We predict that if the dunes continue to be blown towards the forest, they could cover a large portion of it. We believe that this is a threat to the dune forest as well as some of the proposed management plans to open the area to public access. Friends of the Dunes regularly hosts volunteer work days to restore the dune forest and evaluate any future actions needed. Guided walks are offered to individuals and groups who wish to conduct personal research at the dunes. We encourage this to continue as it reinforces the preservation of the habitat through education and awareness.

Appendix Table 1: List of Groups/Organizations involved in consultation and coordination

State Coastal Conservancy	• Friends of the Dunes
• U.S. Fish and Wildlife Service	• Wiyot Tribal Governments
• Bureau of Land Management	Mad River Biologists
Adjacent Land Owners	• Arcata Fish and Wildlife Office
Redwood Gun Club	Sierra Pacific Industries
Manila Community Service	• Explore Northcoast
District	• Center for Natural LandsManagement
• Northwest Information Center of	• Redwood Community Action Agency
the California Historical	• Humboldt Bay Municipal Water
Resources Information System	District

Agency	Permit/Approval
United States Fish and Wildlife Service/ National Marine Fisheries Service	Section 7 Consultation for Biological Assessment
National Marine Fisheries Service	Section 305 Consultation concurrent with Section 7
United States Fish and Wildlife Service	Federal Migratory Bird Treaty Act consultation
United States Army Corps of Engineers	Nationwide 36 permit/concurrence (for boat ramps)
California Department of Fish and Game	Section 2080 consultation for species that are also federally protected
California Department of Fish and Game	Fish & Game Code Sections 3503 and 3503.5 Bird Nest Protection such as osprey consultation
California Department of Fish and Game	Fish & Game Code Sections 3511, 4700, 5050 and 5515 fully protected animals consultation
Humboldt Bay Harbor, Recreation and Conservation District	Encroachment Permit for projects in tidelands below Mean High Water Elevations
California Coastal Commission	Section 307 permit for projects located within the Coastal Zone
North Coast Regional Water Quality Control Board	Section 401 Water Quality Certification
State Water Resources Board	General Construction Water Discharge Requirements for construction activities covering over one acre.
State and Tribal Historic Preservation Office	Section 106 consultation for record search and Field Surveys

Table 2: Permits needed for Ma-le'l Dunes Access Plan Project

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	Alternative A: The Proposed Plan	Alternative B: Multi-Use Throughout	Alternative C: Protection and Restoration	Alternative D: No Action
Public Use	<ul> <li>Common Features of the Plan Alternatives for Public Use<sup>1</sup>.</li> <li>Continued and increased pedestrian use of 1 mile of trail and new pedestrian use of 3.5 miles of trail.</li> <li>Continued and increased equestrian use on 0.6 miles of trail and the waveslope.</li> <li>Continued and increased off leash dog walking in Ma-Iel South on designated traits and the waveslope</li> <li>Cano and kayak accessibility via launching at one designated location.</li> <li>ADA on 0.5 miles of trail and in the Ma-Iel South and Ma-Iel North parking areas.</li> <li>Bicycle riding along the access road.</li> <li>Continued an increased off leased vegetative gathering for personal use from designated forest trails from May to November in Ma-Iel South only, and otherwise by special permit on a case-by-case basis.</li> </ul>	<ul> <li>Common Features of the Plan Alternatives for Public Use<sup>1</sup>.</li> <li>Pedestina trails would consist of 3.6 miles of new trails, 1 mile of preexising trails, and off-trail use in Ma-le'l South.</li> <li>Off leash dog walking in Ma-le'l North</li> <li>Equestrian use on portions of the nearshore dunes/boastal (Latkak) trail</li> <li>Bicycle riding throughout the Ma-le'l Dunes CMA</li> <li>Canoe and kayak accessibility via launching in designated locations.</li> <li>Increased use of the Ma-le'l South day use/picnic area.</li> <li>Off-trail vegetative gathering would be allowed at Ma-le'l South.</li> </ul>	<ul> <li>Common Features of the Plan Alternatives for Public Use<sup>1</sup>.</li> <li>The day use/picnic area located at Ma-le'l South and trails currently designated as beach hiking trails at Ma-le'l South would continue to be open to the public for pedestrian use.</li> <li>Ma-le'l North would only be open for docent-led pedestrian use, tours and field trips.</li> <li>There would be no equestrian use, buyele riding, or dog waiking throughout the CMA.</li> </ul>	<ul> <li>Preexisting uses at Ma-le'i South would continue. No new uses at Ma-le'i North would take place</li> </ul>
Access and Circulation	<ul> <li>Improvements to the gravel access road including 'puil outs,' a turning radius at the Young Lane-access road intersection, and gutter sections along roadway.</li> <li>Signage along the access road that would advise pedestrians, bicyclists, and motorists to use caution along the road.</li> </ul>	<ul> <li>Increased signage</li> <li>Improvements to the access road and parking areas including paving the areas with asphalt.</li> </ul>	<ul> <li>Improvements to the access road would not be made.</li> </ul>	Improvements to the access road would not be made.     Ma-le'I North would not be open for public access without permit or docent     A full time caretaker would be onsite.     Vehicle control, law

Table 3: List of proposed plan and alternatives

<sup>1</sup> See Section 2.1.1 Common Features of the Plan Alternatives

				enforcement, and security would be established.
	Alternative A: The Proposed Plan	Alternative B: Multi-Use Throughout	Alternative C: Protection and Restoration	Alternative D: No Action
Access Infrastructure	<ul> <li>Common Features of the Plan Alternatives for Access infrastructure.</li> <li>Installation of a bicyole rack and a water spligot for equestrian use at the Ma-le'I South day use area.</li> <li>Ma-le'I North parking area would be improved with re-surfacing with crushed gravel, expansion for nine additional vehicles, and ADA vehicle spots.</li> <li>Amenities at the Ma-le'I North would include bicycle rack, information klosks, plonic table, waste management receptacles, and vauit toilets.</li> <li>1,000 th safety cornidor along access road.</li> <li>Trailier pad would be improved</li> <li>Cance and kayak ramp at Ma-le'I North parking area</li> <li>Trail upgrades including trailhead steps, cable steps, and wooden steps.</li> <li>Revegatation of casual trails</li> <li>Footbridge over wetland</li> <li>Dune view deck and eight benches</li> <li>Signage for safety, information, and receitable, information, and receitable, information, and</li> </ul>	<ul> <li>Common Features of the Plan Alternatives for Access Infrastructure.</li> <li>A pedestrian trail connecting Ma-le'I South and Ma-le'I North along the nearshore dunes.</li> </ul>	<ul> <li>Common Features of the Plan Alternatives for Access Infrastructure.</li> <li>A management plan for the access road would be prepared and implemented.</li> <li>Signage would be installed to tell the provisions of entry and the regulations.</li> <li>A management plan for the access road would be prepared and implemented.</li> </ul>	<ul> <li>No additional access infrastructure would be installed other than the preexisting amenities.</li> </ul>
Access Management	<ul> <li>A full time caretaker would be onsite.</li> <li>Vehicle control, law enforcement, and security would be established.</li> <li>A management plan for the access road would be prepared and implemented.</li> </ul>	<ul> <li>A full time caretaker would be onsite.</li> <li>Vehicle control, law enforcement, and security would be established.</li> <li>A management plan for the access road would be prepared and implemented.</li> </ul>	<ul> <li>No on-site caretaker. Vehicle control, law enforcement, and security would not be established.</li> <li>A management plan for the access road would be prepared and implemented.</li> </ul>	<ul> <li>No on-site caretaker. Vehicle control, law enforcement, and security would not be established.</li> </ul>

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