



# Dunes Climate Ready Grant Update

November 2016 - January 2017

## Sixth Quarterly Update

The Dunes Climate Ready Grant (Coastal Vulnerability and Adaptation Study) is funded in part by the State Coastal Conservancy's Climate Ready Program. It is designed to further our understanding of how climate change will impact Humboldt's coastal dunes and test the effectiveness of different adaptation strategies. We expect our coastal dunes to be affected by sea level rise as they are forced to adapt and move east, away from the encroaching ocean. As part of the education and outreach component of the grant, quarterly email updates are sent to email subscribers keeping them up to date on the progress of the grant. To learn more about the project, previous updates can be found [here](#).

## 2016 Summer Field Survey

Most of the summer survey was completed by early October 2016. Data cleaning of the summer 2016 surveys is complete, results are being graphed, and inconsistencies in the data are being identified. The winter 2017 survey will resolve any remaining inconsistencies.

## 2017 Winter Field Survey

The winter survey began in early January and is proceeding faster than in the past thanks to three crew leaders, new compatible equipment, and high volunteer and partner participation. After several years of mild winter storms on the coast, the last two winters have had large winter storm surges and wave energy causing scarping and erosion of the foredune along much of the 32 mile Eureka littoral cell. It will be interesting to continue monitoring as the foredune recovers from these scarp events.



John Herrera uses a Trimble R10 Real Time Kinematic GPS units at Lanphere.



Ryan Arsenault plants seeds in the dune mat *Elymus* treatment.

## Lanphere Adaptation Site

Native planting at the Lanphere adaptation site was completed in early February 2017. The site will compare the effects of planting three different assemblages of dune vegetation on sediment transport and deposition. First, *Ammophila arenaria* (European beachgrass) removal was completed at all sites. All three sites were then planted with an equal density of the native plants. The composition of dune plantings was different for each site, 1) *Elymus mollis* (native dune grass) only, 2) *Elymus* and dune mat species, and 3) just dune mat species.

An aerial kite was flown over the adaptation site and will be used to construct a digital elevation model of the foredune. These flights will be repeated approximately monthly until the next scheduled ground survey in May. The adaptation experiment will examine how vegetation type influences sediment movement. In particular, it will be of interest to find out which vegetation assemblages will best allow sand movement over the crest of the foredune, allowing for possible foredune translation (a desired outcome in response to sea level rise).

### **Eel River Adaptation site**

The Eel River adaptation site was highly eroded in a January 2017 storm event, and only a small portion of the transplanted *Elymus* remain. The site was overwashed, removing a significant amount of sand, and all of the driftwood that had been placed there. This site will be reevaluated for alternative adaptation strategies. The Eel River south spit has high rates of subsidence, steeper beaches with higher wave energy, and apparent sediment deficits compared with the north spit. More aggressive adaptation methods may be needed at this site. Recommendations will emerge from the study based on survey results. In addition, alternative methods may be tested on the Eel River Estuary Preserve site as part of the proposed restoration there.



The Eel River adaptation site after recent overwashing. Note the newly eroded low areas in the left middleground behind the remnants of plantings. Photo Alex Blessing.

### **New Bureau of Land Management Propagation Site**

As reported in the last quarterly update, the propagation site was moved to a location just north of the Friends of the Dunes/Bureau of Land Management boundary due to excessive rabbit grazing and insufficient sediment supply at the Friends of the Dunes site. *Elymus* planting at the new site is underway. High tides have recently washed up and over the incipient foredune, flattening newly transplanted *Elymus*. Unless further erosion occurs these plants are expected to survive due to their high salinity tolerance.



*Elymus* plantings at the BLM propagation site before (left) and after (right) scarping and overwash.

## Shoreline Trend Analysis

Digital Shoreline Analysis Software is being used to calculate rates of shoreline loss and gain since 1939, the date of the earliest air photos. Additional mapping of geomorphic features such as blowouts and washovers will be used to describe events not captured by the shoreline analysis. This information, together with survey data, will be used to develop a preliminary analysis of sea level rise vulnerability.

## Outreach

A public presentation was held on February 15, 2017 at the Humboldt Coastal Nature Center. Andrea Pickart, Coastal Ecologist for the US Fish & Wildlife Service, presented an update on the Dunes Climate Ready Study. A summary of written comments, and questions and answers from the presentation will be sent to this list in March.

## Dunes Climate Ready Walk at the Eel River Wildlife Area

**Friday, April 14, 9 a.m. - 11 a.m.**

Learn about the Dunes Climate Ready Study and the impacts of winter conditions on the Eel River Wildlife Area with Michael van Hattem, Environmental Scientist at the California Department of Fish and Wildlife. R.S.V.P. required by contacting Friends of the Dunes at 707-444-1397, or replying to this email with your phone number.



Native yellow sand verbena.

**For additional background information visit the following websites:**

- \* [Humboldt Bay National Wildlife Refuge](#)
- \* [State Coastal Conservancy](#)
- \* [Friends of the Dunes](#)



Friends of the Dunes | PO Box 186 | Arcata | CA | 95518