



BEACH DUNE TECHNICAL BULLETIN 1 / JULY 2024

Recommendations for Dune Restoration Projects on the Texas Gulf Coast

The Use of Organic Brushy Materials and
Hay Bales to Restore Dunes



Texas General Land Office
Commissioner Dawn Buckingham, M.D.

Introduction



As a resilient natural barrier to the destructive forces of wind and waves, sand dunes are the least expensive and most efficient defense against storm-surge flooding and beach erosion. Dunes absorb the impact of storm surge and high waves, preventing or delaying intrusion of waters into inland areas. Dunes hold sand that replaces eroded beaches after storms and buffer windblown sand and salt spray. This natural defense can be strengthened by increasing the height and stability of existing dunes and by building new dunes.

In order to conduct a dune restoration project, a beachfront construction certificate and dune protection permit may be required. Questions about the beach dune regulations or the permitting process should be directed to the county commissioners court, city, or the Land Office.

This bulletin provides recommendations that landowners, city and county planners, developers, and industry can use to restore sand dunes and promote dune restoration on the coast through the use of various organic brushy materials and hay bales.

Recommendations for Dune Restoration Using Organic Brushy Materials



Texas General Land Office's current recommendations for dune restoration projects using organic brushy material such as palm trees or Christmas trees.

- i. Flocked Christmas trees may not be used and all ornaments, decorations, tree stands, and related items must be removed from the trees prior to placement on the beach.
- ii. Vegetative materials should be placed along the vegetation line and parallel to the shoreline, if possible. Materials may not be placed more than 20 feet seaward of the line of vegetation, unless prior written approval has been obtained from the GLO, and must not interfere or restrict the public use of the beach at normal high tide.
- iii. The organic brushy materials should be staked or otherwise secured to prevent movement during high tide events. Any material used to secure the trees must be organic and biodegradable.
- iv. The vegetative materials should be monitored to evaluate their effectiveness in restoring dunes and to ensure they are not moved onto the public beach after a high tide event. If the materials become dislodged or moved to a location where they restrict or interfere with public use of the beach at normal high tide, they must be removed or relocated.
- v. Sand obtained by scraping or grading dunes or the beach may not be placed on top of the trees or other brushy materials.
- vi. Pedestrian traffic on or across dune areas must be minimized to the greatest extent practicable during material placement.

Christmas Tree Dune Restoration Project Example:

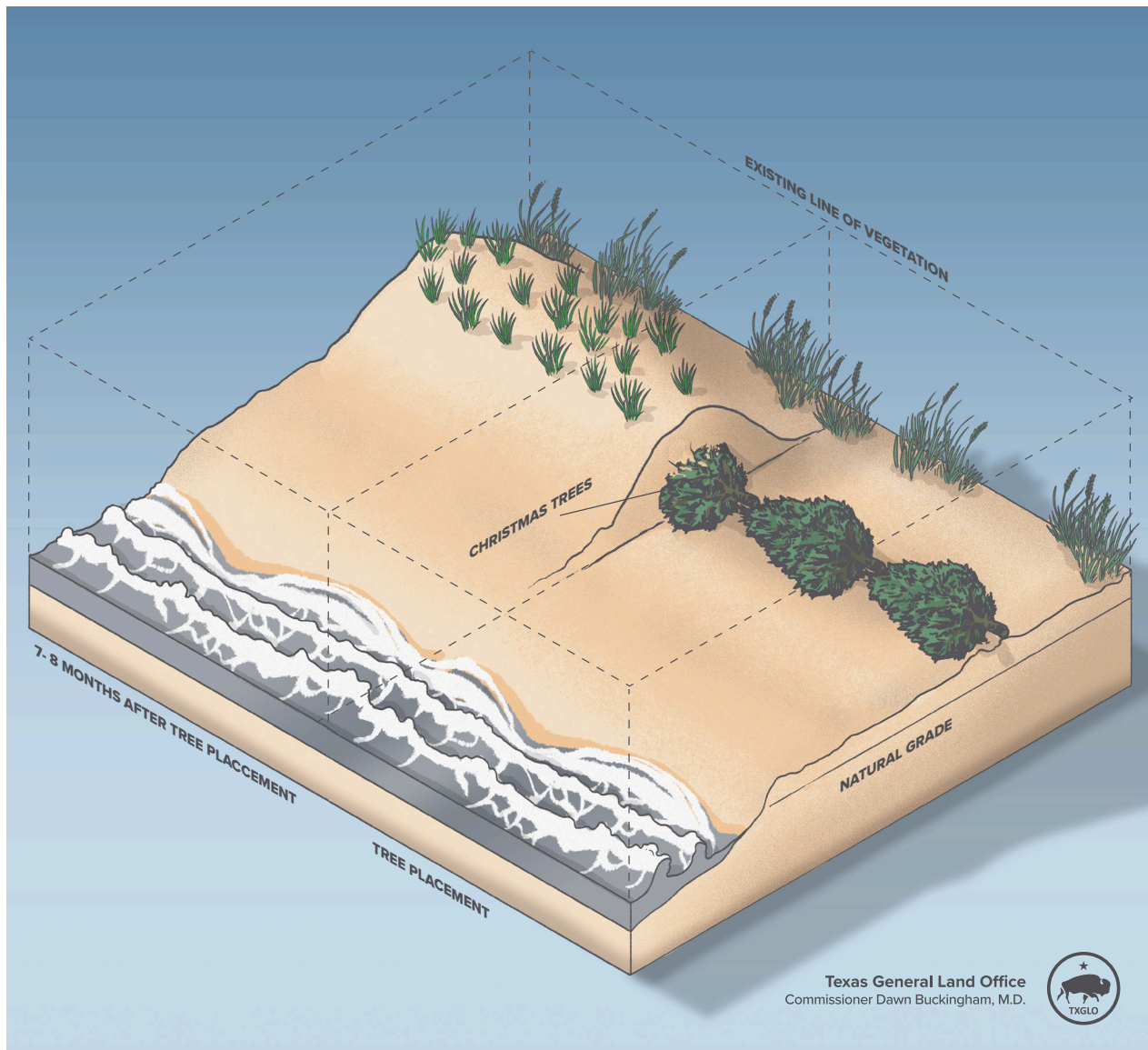


Figure1: Before and after of tree placement on beachfront.

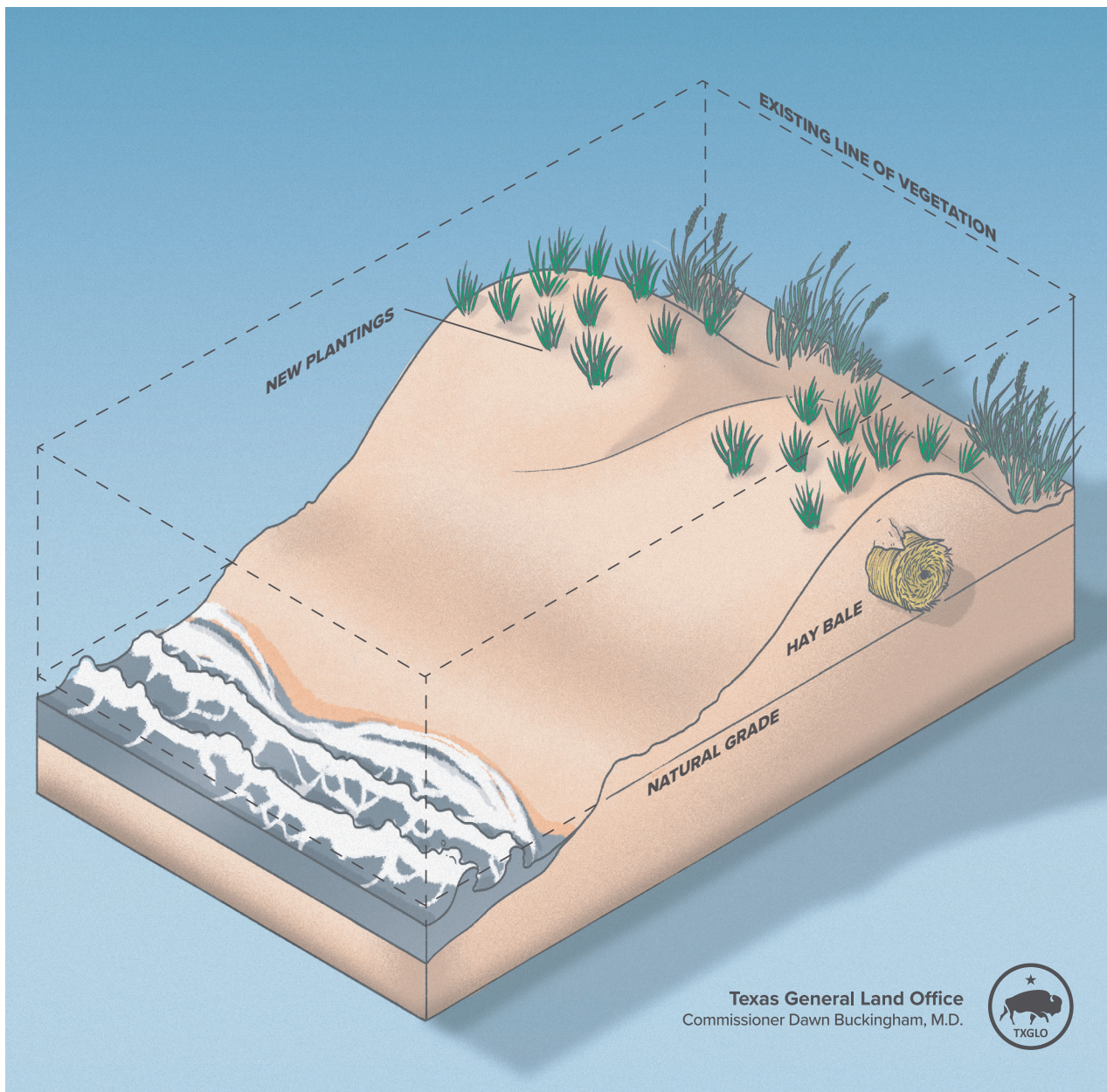
Recommendations for Dune Restoration Using Hay Bales



Below are the Texas General Land Office's current recommendations for dune restoration projects with a hay bale core.

- i. The GLO currently has limited information regarding the effectiveness of large round hay bales in restoring dunes, their performance over time, or their long-term impacts on the beach dune system and recommend that any hay bale dune project be monitored.
- ii. Hay bales should be covered with beach-quality sand, and indigenous dune vegetation should be planted in the sand covering the bales to help stabilize the sand. The hay will help provide nutrients to the vegetation as it becomes established, and the vegetation will trap sand as the hay bale core slowly degrades.
- iii. Restored dunes using hay bales and beach-quality sand may not be placed more than 20 feet seaward of the line of vegetation, unless prior written approval has been obtained from the GLO, and must not interfere or restrict the public use of the beach at normal high tide.
- iv. Hay bales should be placed adequately landward so they don't move during high water events and should be covered with enough beach-quality sand to prevent them from dispersing. Exposed hay bales on the beachfront may result in the spread of hay or the germination of dormant seeds from the bales.
- v. If the hay bales become uncovered, the bales should be covered with additional beach-quality sand from off-site. Hay bales that begin to fail and/or come apart must be removed from the beachfront area.
- vi. If possible, bales of dried native dune vegetation should be used instead of bales of invasive or nonindigenous vegetation. Hay bales that may contain invasive or nonindigenous vegetation or seeds should remain covered with beach-quality sand.
- vii. Sand obtained by scraping or grading dunes or the beach may not be placed on top of hay bales.
- viii. Any material used to secure the bales must be organic and biodegradable. Any plastic netting around the bales must be removed before they are placed on the beachfront.
- ix. Hay bales should be placed round-side down with the round side facing the shoreline to mimic natural dune shapes and contours. Bales should only be placed parallel to the shoreline.

Hay Bale Dune Restoration Project Example:



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Figure 2: Cross-section view of hay bale core dune.

Hay Bale Dune Restoration Project Example:

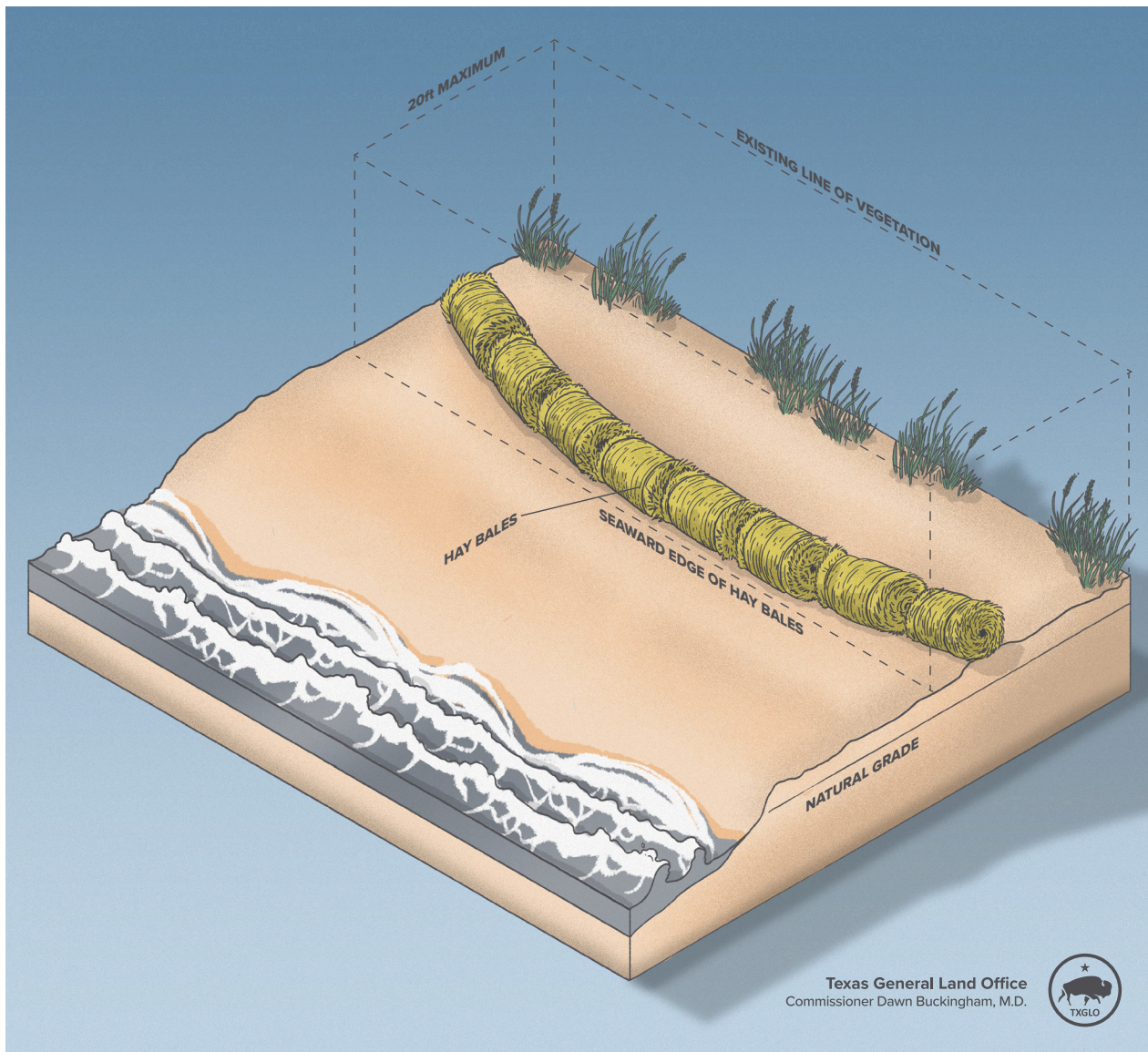


Figure 3: Placement of hay bales on beachfront