

Re-vegetate Sand Dunes

Overview

- Sand dunes provide protection from storm surge flooding during coastal storms.
- Vegetated dunes trap air-borne sand which prevents dune erosion and helps the dune grow. A robust sand dune is more likely to withstand storm surge and prevent flooding on the landward side of the dune.
- The leaves of the plants reduce everyday wind erosion by catching air-borne sand.
- Vegetated dunes provide habitat for native Delawarean coastal species.
- Vegetated dunes provide aesthetic value.
- Check to see if the dune is in a rare, threatened, or endangered shorebird habitat before altering the dune in any way. Action may be limited in areas within a protected shorebird habitat.

Design Recommendations:

- It is best to re-plant dunes between November and April.
- There are three zones of dune vegetation:
 - Frontal dune zone – closest to the water, grasses and herbaceous plants (beach grass).
 - Back dune zone – behind the frontal zone, trees, shrubs, vines, grasses and herbaceous plants (beach grass, beach heather, seaside goldenrod and prickly pear cactus).
 - Maritime forest zone – furthest from the ocean, pines and hardwoods (bayberry and beach plum).
- Most re-vegetation projects use Cape American beach grass (*Ammophila breviligulata*) to re-vegetate the frontal and back dune zones.
- Always plant native plant species.



Photo credit: DNREC

Key Takeaways

During coastal storms, high-energy waves can destroy protective sand dunes by washing away the dune base. Additionally, the high-velocity winds of coastal storms can cause sand erosion. Dune erosion can lead to receding and the eventual loss of dunes.

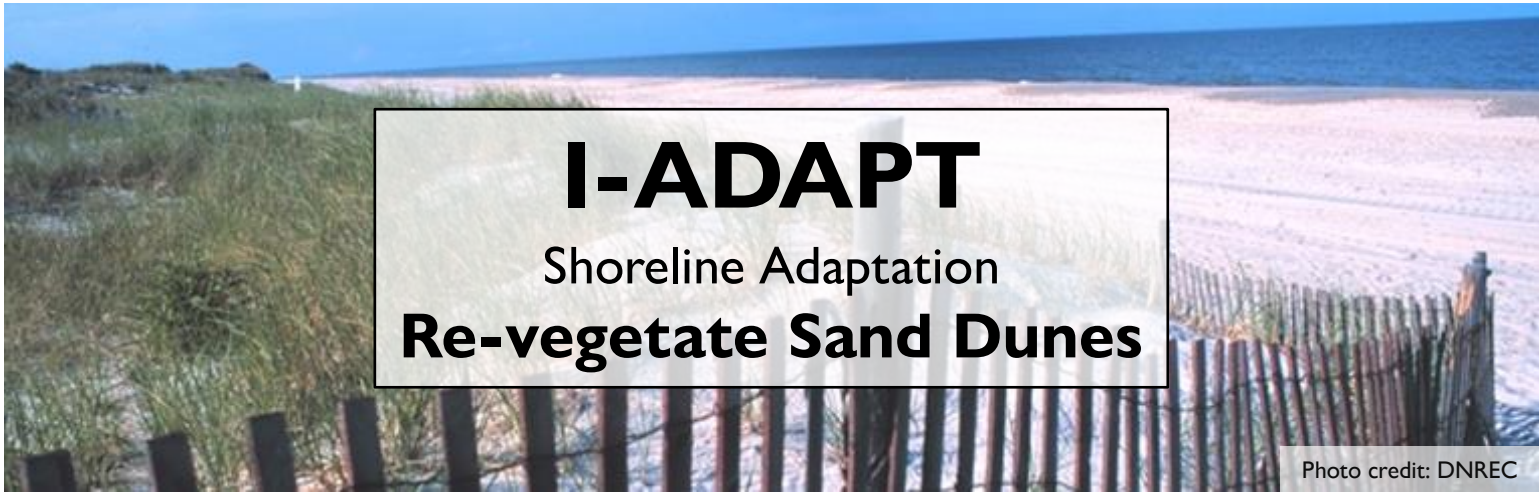
If the dune is destroyed, it no longer offers flood protection for the structures behind it.

Re-vegetating sand dunes makes them more likely to withstand wind and flooding events and will potentially reduce storm damage associated costs.

Estimated Costs/Benefits

*U.S. dollars (2022), estimates are subject to change

Potential Costs (500 sq ft dune)		Potential Benefits (1,000 sq ft structure)	
Item	Estimate	Post-Flooding Recovery Action	Estimate
Cape American beach grass (1,000 plants)	\$1,550	Beach replenishment due to flood/wind erosion damage	\$295 per 5 tons of sand
Seven pounds of slow release 10-10-10 fertilizer	\$25-\$50	Flood damaged structure recovery (professional clean-up, mold removal, replacement/ repair of flood damaged items)	1 inch water ↓ 4 feet water \$10,800-\$53,500+ ↓ \$43,400-\$203,300+
ESTIMATED TOTAL COST	\$1,575-\$1,600	ESTIMATED TOTAL SAVINGS	\$11,095 - \$203,495+



I-ADAPT

Shoreline Adaptation

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Photo credit: DNREC

Potential Funding Sources

- [DOI Partners for Fish and Wildlife Program](#)
- [Delaware Water Pollution Control Revolving Fund](#)
- [Building Resilient Infrastructure and Communities \(BRIC\)](#)
- [Phragmites Control Cost-Share Program](#)

Expected Maintenance

Initial maintenance:

- For the first and second years after planting Cape American beach grass:
 - March/April: Apply 7 pounds of slow release 10-10-10 fertilizer per 500 square feet.
 - September: Repeat previous fertilizer application.

Periodic maintenance:

- After second year, only fertilize as necessary.
- Replace plants as needed.

Additional Resources

- [DNREC Delaware's Coastal Dunes](#)
- [DNREC You Can Help Protect Beaches and Dunes](#)
- [Sea Grant Building and Planting Coastal Sand Dunes](#)
- [USDA New Jersey-Cape May Plant Materials Center](#)

Resources can also be found at <https://de.gov/iadapt>

Additional Actions

- Consider installing a sand fence.
- Encourage neighbors to also re-vegetate to help increase dune stability.

Permitting Agencies

Contacts for permitting requirements include but are not limited to the following:

- Your city and/or county government for local flood ordinances or regulations
- Your city and/or county government for building permits
- [DNREC Wetlands and Subaqueous Lands Permit](#)

Who to Contact

- Contractor
- [811 Call Before You Dig](#)
- Native plant nursery



Photo credit: DNREC

Technical definitions and more information are located on the I-ADAPT website: <https://de.gov/iadapt>.



This information is intended to be used for planning purposes. It is not intended to substitute or take precedence over the guidance of design engineers, contractors, utility companies or regulatory agencies.

For more information, contact DNREC's Division of Climate, Coastal and Energy at DNREC_IADAPT@Delaware.gov

