

# Appendix A: Vegetation Plan

## Overview:

The vegetation plan is formulated to the unique needs of embankment dams near freshwater and coastal areas, focusing on stabilizing soil, preventing erosion, and maintaining ecosystem health. It recommends selecting plant species that can thrive in the project area, ensuring biodiversity and resilience to changing conditions.

## Key Criteria:

- **Resistant to geese** (they avoid strong-smelling, fibrous, or tough plants)
- **Low maintenance** (minimal mowing, drought/salt tolerance)
- **Erosion control** (stabilizes soil near freshwater sources)

## Recommended Plants:

### Ground Covers:

1. **Creeping Thyme (*Thymus serpyllum* or *Thymus praecox*)** – Aromatic, geese avoid it, low-growing, minimal mowing.
2. **Seaside Goldenrod (*Solidago sempervirens*)** – Thrives in coastal conditions, deep-rooted for stability.
3. **Bearberry (*Arctostaphylos uva-ursi*)** – Dense, low-maintenance, salt/drought tolerant.
4. **Wild Strawberry (*Fragaria virginiana*)** – Forms a ground mat, spreads easily, wildlife-friendly.
5. **Common Yarrow (*Achillea millefolium*)** – Drought/salt-resistant, tolerates poor soil, fibrous leaves deter geese.

### Native Grasses & Sedges:

6. **Little Bluestem (*Schizachyrium scoparium*)** – Deep-rooted, erosion-resistant, drought/salt tolerant.
7. **Switchgrass (*Panicum virgatum*)** – Good for stabilization, upright growth.
8. **Baltic Rush (*Juncus balticus*)** – Thrives in moist areas, controls erosion.
9. **Pennsylvania Sedge (*Carex pennsylvanica*)** – Dense, low-growing, geese-resistant.
10. **Beach Grass (*Ammophila breviligulata*)** – Ideal for coastal stabilization, low maintenance.

## Implementation Tips:

- **Diverse mix** of ground covers and grasses for resilience.

- **Avoid manicured turf;** geese prefer open, mowed areas.
- **Native plants** attract pollinators, enhance biodiversity.
- **Minimal mowing** – once or twice a year max for aesthetic control.

For **embankment dams**, vegetation must provide **erosion control, soil stabilization, and low maintenance** while being resistant to geese. Below is an **updated list** of plant species well-suited for embankment dams near freshwater and the coast:

---

### Ground Covers (Erosion Control, Low Maintenance)

1. **Creeping Red Fescue (*Festuca rubra*)** – Deep-rooted, drought/salt-tolerant, excellent for stabilizing slopes.
2. **Creeping Juniper (*Juniperus horizontalis*)** – Drought-resistant, geese avoid it, effective at holding soil.
3. **Pennsylvania Sedge (*Carex pensylvanica*)** – Low-growing, dense roots prevent erosion, thrives in sandy/rocky soil.
4. **Bearberry (*Arctostaphylos uva-ursi*)** – Excellent erosion control, drought/salt-tolerant.
5. **Wild Strawberry (*Fragaria virginiana*)** – Forms a ground mat, spreads easily, stabilizes soil.

---

### Native Grasses (Slope Stability, Deep Roots)

6. **Little Bluestem (*Schizachyrium scoparium*)** – Deep-rooted, prevents soil washout, low maintenance.
7. **Switchgrass (*Panicum virgatum*)** – Erosion-resistant, deep-rooted, geese generally avoid it.
8. **Big Bluestem (*Andropogon gerardii*)** – Tall, fibrous roots, holds embankment soil well.
9. **Saltmeadow Cordgrass (*Spartina patens*)** – Great for coastal embankments, tolerates wet/dry conditions.
10. **Indiangrass (*Sorghastrum nutans*)** – Strong root system, drought-resistant, stabilizes slopes.

---

### Sedges & Rushes (Moisture Control, Erosion Prevention)

11. **Baltic Rush (*Juncus balticus*)** – Deep fibrous roots, grows well in moist embankment zones.
12. **Fox Sedge (*Carex vulpinoidea*)** – Thrives in fluctuating water conditions, holds soil in place.

13. **Woolgrass (*Scirpus cyperinus*)** – Strong roots, excellent for embankments near water.
  14. **Soft Rush (*Juncus effusus*)** – Clumping growth, stabilizes damp embankment areas.
  15. **Tussock Sedge (*Carex stricta*)** – Thrives in wetlands, builds soil stability.
- 

## Implementation Tips for Embankment Dams

- **Avoid shallow-rooted turf grasses** (e.g., Kentucky bluegrass) – poor erosion resistance.
- **Use deep-rooted perennials** to anchor soil and reduce slippage.
- **Mix species** to prevent monoculture failure and enhance biodiversity.
- **Minimal mowing** – reduces maintenance, discourages geese.

## Vegetation Recommendations for Embankment Dams Based on Slope Gradient

### 1. Steep Slopes (Greater than 3:1 Slope)

#### Key Requirements:

- Deep-rooted plants to prevent soil erosion and slippage.
- Low-maintenance vegetation to reduce mowing needs.
- Drought and salt-resistant plants if near coastal conditions.

#### Recommended Plants:

- **Deep-Rooted Grasses & Sedges (Strong Soil Holders)**
  1. **Little Bluestem (*Schizachyrium scoparium*)** – Drought/salt-tolerant, fibrous roots stabilize soil.
  2. **Switchgrass (*Panicum virgatum*)** – Excellent erosion control, adaptable to wet and dry conditions.
  3. **Big Bluestem (*Andropogon gerardii*)** – Tall, strong roots hold steep slopes.
  4. **Tussock Sedge (*Carex stricta*)** – Handles seasonal wet/dry soil shifts, prevents soil movement.
  5. **Baltic Rush (*Juncus balticus*)** – Ideal for embankments near water, strong root structure.
- **Low-Growing Ground Covers (Slope Protection, Geese-Resistant)**
  6. **Creeping Juniper (*Juniperus horizontalis*)** – Evergreen, spreads to form erosion-resistant mat.
  7. **Bearberry (*Arctostaphylos uva-ursi*)** – Excellent for dry slopes, low-maintenance, strong roots.
  8. **Wild Strawberry (*Fragaria virginiana*)** – Spreads easily, holds soil in place.
  9. **Common Yarrow (*Achillea millefolium*)** – Deep fibrous roots, tough and drought-resistant.
  10. **Red Creeping Fescue (*Festuca rubra*)** – Low-growing, erosion control, geese tend

to avoid it.

---

## 2. Gentle Slopes (Less than 3:1 Slope)

### Key Requirements:

- Adaptable plants that allow for some mowing if needed.
- Mixture of grasses and native perennials for biodiversity.
- Salt and drought-resistant species for coastal environments.

### Recommended Plants:

- **Moderate-Height Grasses & Perennials (Erosion & Aesthetics)**
    1. **Indiangrass (*Sorghastrum nutans*)** – Stabilizes soil, provides seasonal color.
    2. **Saltmeadow Cordgrass (*Spartina patens*)** – Great for wet areas near water.
    3. **Soft Rush (*Juncus effusus*)** – Works well in damp embankments, holds soil in place.
    4. **Golden Alexanders (*Zizia aurea*)** – Attracts pollinators, low-maintenance.
    5. **Seaside Goldenrod (*Solidago sempervirens*)** – Coastal erosion control, strong roots.
  - **Mowable, Low-Growing Grasses & Sedges (Blended with Perennials)**
    6. **Creeping Red Fescue (*Festuca rubra*)** – Low-maintenance, good for gentle slopes.
    7. **Pennsylvania Sedge (*Carex pennsylvanica*)** – Soft texture, can be mowed occasionally.
    8. **Woolgrass (*Scirpus cyperinus*)** – Excellent for moisture control.
    9. **Blue Grama (*Bouteloua gracilis*)** – Short native grass, geese-resistant.
    10. **Fox Sedge (*Carex vulpinoidea*)** – Holds soil, great for semi-wet areas.
- 

## Maintenance & Planting Strategy

- **For Steep Slopes:**
  - Plant **deep-rooted grasses and ground covers** to prevent erosion.
  - Use a **hydroseeding mix** with native species for quick establishment.
  - **No mowing** – let vegetation grow naturally.
- **For Gentle Slopes:**
  - Use a **mix of mowable grasses and native wildflowers** for aesthetics.
  - Mowing can be limited to **once or twice per year** to discourage geese.
  - **Encourage deep-rooting species** to maintain soil stability.

## Recommended Native Plants for Embankment Stabilization:

1. **American Beachgrass (*Ammophila breviligulata*)**  
Thrives in sandy soils, excellent for dune and embankment stabilization, and tolerates salt spray.
2. **Seaside Goldenrod (*Solidago sempervirens*)**  
Salt-tolerant with deep roots, provides erosion control, and adds aesthetic value with yellow blooms.
3. **Switchgrass (*Panicum virgatum*)**  
Deep-rooted, adaptable to various soils, and offers excellent erosion control.
4. **Little Bluestem (*Schizachyrium scoparium*)**  
Drought-resistant, forms dense clumps aiding in soil stabilization.
5. **Pennsylvania Sedge (*Carex pensylvanica*)**  
Low-growing, forms a dense mat, suitable for gentle slopes, and requires minimal maintenance.
6. **Creeping Red Fescue (*Festuca rubra*)**  
Shade-tolerant, forms a dense sod, and is effective for erosion control on slopes.

## Seed Mix Recommendations:

For effective establishment, using a specialized seed mix designed for erosion control and suitable for Rhode Island's coastal environment is recommended. One such option is the **New England Erosion Control/Restoration Mix for Dry Sites**, which includes a blend of native grasses and wildflowers tailored for dry and well-drained soils. This mix is particularly appropriate for areas requiring quick cover during ecological restoration.

## [New England Wetland Plants](#)

## Implementation Tips:

- **Site Preparation:** Clear existing invasive vegetation and prepare the soil to ensure good seed-to-soil contact.
- **Seeding Time:** Optimal seeding periods are spring and late summer to early fall, aligning with favorable growing conditions.
- **Seeding Method:** Broadcast seeding followed by light raking or rolling ensures seeds are adequately embedded in the soil.
- **Mulching:** Applying a layer of straw mulch helps retain soil moisture and protects seeds from erosion.
- **Maintenance:** Minimal mowing is required; once or twice a year is sufficient. Regular monitoring for invasive species is crucial to maintain the integrity of the native plant community.