Eastern Invasives Management Network
Sandy Neck Barrier Beach, Cape Cod, Massachusetts

Threat Abatement Priorities and Strategies

Key Ecological Factors for Dune/Swale system

Note: Factors are occurring at two scales here - the scale of an individual swale and the scale of the entire dune/swale system

Condition

A. Cover dominance of native swale species in individual swales

The indicator is native species cover and Phragmites density and cover of thatch. Research has shown that Phragmites reduces swale species richness and density in areas of high density and thatch. Preliminary research results are also showing that recovery post treatment is hindered in area of thatch.

B. Overall swale diversity levels in entire dune/swale system

The swales exhibit a range of types that were preliminarily classified by Shumway in1986. A change in the numbers of each type of swale could indicate larger climatic shifts that would affect sediment movement and precipitation. Changes in these factors could affect swale creation/maintenance. It is not known what changes in overall percentages of swale types would be significant, however.

C. Native Species composition of entire dune/swale system

The indicator is the % of swales with invasive species as well as dominance of invasive species in the dune system. It is not known at what levels the system is not restorable.

Landscape Context

D. Swale Hydrology

Plant establishment in swales is likely to occur only where water table is within reach of plant roots. Hydrologic monitoring of Phragmites at another site in Mass has shown that Phragmites may change wetland hydrology. More research on this will be important to developing this as a key factor.

E. Dune movement/sand deposition patterns in entire dune/swale system

The indicator is the % of dune/swale area allowed to move naturally. Trails and roads as well as vehicle traffic and dune stabilization from beach grass planting and other techniques are important rating factors. Research has also indicated that invasive species in swales may be correlated with nearby trails.

Current Threat Abatement Priorities for Dune/Swale Target

An invasives removal plan was written for the site in January 2002.

Goals and Priorities in the plan

1) Prevent any new invasions of invasive plant species in the dune/swale ecosystem and prevent purple loosestrife from becoming established in any additional swales.
2) Restore the natural structure, composition, and function of the swale community by halting the spread of Phragmites and reducing the number of invaded swales within 5 years.
3) Prevent as much additional disturbance as possible to swales while restoration activities are being accomplished.
4) Document present distribution of Phragmites in the saltmarsh system and determine if spread is occurring. Given that Phragmites is affecting a very low percentage of this target, this is a low priority.

Phragmites is currently in 55 of 133 swales (41% - 10 acres) at Sandy Neck. Although historic invasion patterns are unknown it appears to be spreading rapidly as Shumway documented Phragmites in only 6 of 23 swales (26%) studied at Sandy Neck in 1996. Within the Phragmites invasion, the most important priority is to keep uninvaded swales free of Phragmites. Newly invaded swales (less than ¼ cover) are second in priority. Isolated invasions should be third priority. Last priority is removal of dense Phragmites clones, particularly where many occur close together.

Other TNC priorities at the site that affect key factors are to support swale research on hydrology and nutrient effects of Phragmites on swales as well as to participate in town long term management planning. Additional interdunal trails are currently proposed for the site.

Accomplishments in 2002

- A researcher removed all purple loosestrife in 2001 and 2002.
- Phragmites pre-treatment monitoring was accomplished in 3 treatment swales and 2 controls and photographic monitoring was done for all treated swales.
- Twenty-nine % of the swales (16) infested with Phragmites were treated in 2002 with all Phragmites herbicided in each swale.
- In the salt marsh, researcher GPSed Phrag stands and placed markers on the edge of current invasions so that spread beyond those markers or retreat due to treatments or other factors can be assessed.

Priorities for 2003 based on Key Factors

- Key factors need review by experts
- Continue Phragmites removal in swales with first priority of retreating swales treated last year. Given impacts of dense Phragmites thatch and potential hydrology changes on two key factors A and D, shift priorities so that swales with some native species in them have priority over other swales. Thatch also should be raked.
- Preventing new invasions (of both Phragmites into new swales as well as other new species) should be a top priority as they could affect all factors in unknown ways. We did not survey for other invasive species due to staffing limitations, however, during our work this summer we noted the presence of non-native black pine. In the future the extent and effects of species that are likely to affect dune movement will be prioritized over species that are not likely to affect movement (e.g. black pine may have more affect than oriental bittersweet??)
- Test treatment swath (e.g. meter swath treatments alternating with meter swath nontreatment areas) methodology with the hope of less time and effort spent on each swale.
- Support hydrology and nutrient impacts of Phragmites research to assist in understanding key factor D.
- Continue to advocate for no new trails in swales (key factor E).
- Assess movement of Phragmites in saltmarsh and develop salt marsh key factors.
- Analyze monitoring information and make changes in monitoring protocol if needed.

Threat Abatement Strategies

Our strategy this year was to do a pilot project to assess ease of Phragmites control, effectiveness of using AmeriCorps staff, and to obtain buy in (and build trust) for the project from the town that owns the site. Given budgetary constraints and the need to make sure the project happened this year TNC assumed all responsibility for running the project and the town participated by assisting with logistics, press, and giving general support to the project. Despite challenging logistics and working conditions, 16 swales were treated with good press coverage and TNC gained much respect during

the process. The town has now expressed interest in getting more involved in the future, however, staffing and money will be challenges. A meeting is planned for this fall to discuss next steps and funding options. For next year we hope to get town staff to work on the project, with TNC providing some staffing and training as well as some funding (or help obtaining funding).

Vision of Success

Our vision of success would be town management of the invasives control project on an annual basis as well as increased protection and management for the dune/swale system at the site. No invasive species would exist in the dunes and swales and there would be only a moderate presence in the adjacent salt marsh. No new trails would be built and town staff would assess the site each year for new invasives and do a sweep to treat all reemerging invasives. The only TNC involvement would be to keep tabs on staffing and funding to make sure that budget cuts do not jeopardize the ongoing work at the site.