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Ice plant, like this strip on the dunes in Santa Monica Bay, pushed native plants aside and reduced California coasts to a monoculture that excluded wildlife. Inset: Sand verbena is a native plant that not only does the same job that ice plant does, it also is part of a healthy ecosystem.

Eliminating Ice Plant

A good plant turns invasive

by Don Dale

The ice plant is an innocuous-looking plant, good at stabilizing sand dunes, that has been used for erosion control on thousands of acres of beachside and highway embankments in California for decades. It seemed a good idea at the time, but the tide has turned on ice plant; it's now deemed an invasive species and is being replaced by native grasses and other more desirable plants.

Plants of the genera *Carpobrotus* and *Mesembryanthemum* are a familiar sight to Californians. Ice plant is a

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This restored dune in Redondo Beach, Calif., is an example of the habitat that can be created once ice plant is removed. The primary plant species here are coast buckwheat and California poppies.

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cute succulent with pretty flowers, and its low-profile mats can completely cover a sand dune or highway shoulder once introduced. It can be effective as an erosion control species. In addition, it is tolerant of a lot of environmental hazards, including high salt content of water and soil.

It has some severe downsides. It is a monotonous monoculture that "smothers everything else," says Jo Kitz, vice president and past president of the Los Angeles area chapter of the California Native Plant Society. Along with other nonnative weeds such as mustard, castor beans and pampas grass, ice plant has become known as an invasive species that can upset the delicate ecological balance of the seashore.

Kitz says many coastal organizations, such as state parks, have undertaken eradication measures for ice plant stands, and are replacing them with native grasses and other species that are adapted to that environment. Many of these natives were locally eradicated by ice plant and other invasive vegetation that found no natural enemies once they were introduced, either accidentally or deliberately. Once ice plants shouldered aside the native plants, the local wildlife also suffered and a general ecological breakdown was finalized.

This is a statewide concern, Kitz says, because the loss of diversity and natural beauty covers large areas. Ice plant adds other hazards, she says. For example, it can contribute to landslides because the plants take in so much water in a

rainstorm that the weight can contribute to the collapse of cliffs when wet. It is also not the fire suppressant it was billed to be because it builds on layers of old, dry plant matter, which is flammable. Native species are a better bet.

"The dunes can be absolutely beautiful," Kitz says, if natives are used, and those plants can be just as effective as soil and sand stabilizers. CNPS is dedicated to preserving and spreading information about native plants throughout the state, and ice plant is on its hit list.

Travis Longcore is an ecologist lecturer at the University of California at Los Angeles and a founder of the Urban Wildlands Group. The UWG is a non-profit organization that has demonstrated—with its ongoing Beach Bluffs Restoration Project along Santa Monica Bay from Los Angeles International Airport to Redondo Beach—that ice plant can be successfully replaced with natives. Grasses can either be one of the final coastal natives used to restore the beachfront property, or can be used as a cover crop to grow-in other natives.

"Ice plant is an issue up and down the coast of California," Longcore says. It does stabilize dunes, but it can actually hide erosion under its dense mat. "It's often more of a problem than it's worth."

The Beach Bluffs Restoration Project is a good example of the kind of movement being carried out along the coast. Like many such projects, it has brought together diverse groups that value native plants and has led to the successful replacement of ice plant with even more beautiful natives. Longcore says the project, underway for over three

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years and taking place on Los Angeles County land, has transformed sites that were once 100 percent ice plant.

Ecologically, ice plant just "takes up space," Longcore says, and it pushes out all other native organisms. Native plants can do the same job and provide a complete habitat. In the two areas already transformed by volunteers planting natives, he has seen much more diversity in the bird life, for example. The endangered El Segundo blue butterfly does not now occur in those areas, he says, but the habitat created in the restoration would be adequate if the butterfly could be reestablished in the area. That is one of the goals of the project.

To show how popular this movement is, Longcore cites the avid involvement of the cities Redondo Beach and Torrance, the Los Angeles County Department of Beaches and Harbors, Santa Monica Bay Restoration Commission, California Department of Fish and Game, United States Fish and Wildlife Service and a lot of volunteers. Some of these entities provided funding.

Longcore adds that a survey has shown that local citizens approve of this landscape restoration project, even though some of the grasses may turn brown in late summer and not look their best. Once people learn the biological reasons behind the changeover, they support it. That's why informational signs have been posted along Redondo Beach regarding the project.

The crucial element for committed scientists like Longcore is the reestablishment of native plants that do a better job than ice plant does. Some of the shrubs and bunchgrasses have root systems that go down 6 feet into the sand, and they really stabilize a dune. By putting in a native, like the sand verberna, which is of a succulent nature and resembles ice plant, the volunteers are bringing back organisms that actually fit in a complete habitat.

How practical are these restorations on a commercial scale?

"Long-term erosion control planning requires proper plant species selection. Native perennial bunchgrasses are an excellent choice for erosion control. Unlike nonnative annual grasses, native perennial grasses are long-lived and deep-rooted plants that provide permanent cover. Because of their rooting ability, native grasses provide increased water infiltration rates and less over-surface flow, thus reducing erosion. Most native grasses are



also drought-tolerant, remaining green during the dry season, long after annual erosion-control grasses have turned dry and brown."

This statement is from the Web site of Central Coast Wilds, a private company in Santa Cruz that specializes in taking back dunes, cliffs and other coastal sites from introduced plants. CEO Josh Fodor says his company has removed a lot of ice plant in recent years.

"There's definitely still a lot out there," Fodor says, and some ice plant is still being planted, but in general, he has replaced a lot of the invader with natives.

Removal can be pretty simple. Fodor says that manual pulling is fairly easy with small patches. With one person cutting roots and others rolling up the plants, a mat of ice plant can be excised in a short period of time. Equipment must be used in large areas, because the plants are heavy.

Some 90 percent of the plant material can be removed in this way, but the remaining plant matter—especially roots and stems—can resprout. So, the area must be watched and maintained over the next three years with care taken to physically remove resprouts. Some invasive species, such as the incredibly tenacious European dune grass, is much more difficult to uproot and remove.

Ideally, restoration should be done with plant materials native to that area, whether sand dunes or inland areas. Fodor's company has a practice of collecting seeds from that habitat for two years prior to a restoration, using a plant inventory as a database and then using those, and other seed sources, to replant the area. For some shrubs, seedlings might be transplanted. Perennials, such as native grasses and California sagebrush, as well as annuals, such as wildflowers, would be used in the restoration.

Many public entities, such as municipalities and counties, now specify the use of native plants in restoration



Before (left): One tool used by dune restorers is native grass, such as this fescue, used as a cover crop to grow in other permanent indigenous species. After (below): After two years, the native fescue has declined, but the other plants have been established.

efforts, Fodor says, and the California Department of Transportation will, too, although it still uses ice plant in many cases. Hydroseeding can be used in areas near roadways, but dunes usually must be seeded by hand. The mulch and fertilizers used in hydroseeding would not be beneficial on sand dunes because they would promote the reintroduction and growth of nonnative weeds.


Often, his company uses temporary or permanent irrigation to get reseeded areas established, and that irrigation might be used for years, though infrequently. Portable sprinkler irrigation can be rigged with PVC on top of the ground, and poly drip irrigation lines can be used with micro-jet sprinkler heads.

"There are hundreds of native species available to use," Fodor says, and 50 or 60 species are readily available in seed or containers, but some natives are very difficult to obtain—Central Coast Wilds has its own native plant nursery where it grows seeds for its own projects.

One of the common grasses used in restoration along the coast is Pacific dune grass, which can be utilized in all dune situations. The California, Idaho and Western fescues are also common choices. "They're very drought-tolerant and very beautiful," Fodor says, and when mixed they form thick, lovely coverage pleasing to any landscaper's eye. A seed mix is also generally

used when aiming for erosion control, because species can be blended to thickly cover wet/dry and sun/shade seasons and situations.

The company landscapes a lot of residences and home owner association plantings with natives along the coast, and a "lawn look" can be accomplished by either planting a thick blend to get complete coverage, or planting a species such as red fescue. This is a native, turf-type species that can be mowed, but still requires much less water than other commercial turf varieties. As the landscaper goes farther inland, Fodor says, there are even more natives available for restoration, because the common rangeland grasses, such as California oat grass, come into play.

A poignant example of the need for restoration of dune areas is the El Segundo Dunes Project near Los Angeles International Airport. The last remaining population of the endangered El Segundo blue butterfly lives here in a small area of dunes, and plant restoration is necessary for its survival. It has been a struggle for the groups involved, but the dunes are being restored. The first step is the removal of ice plant and other invasive species. 

Don Dale is a freelance writer and a frequent contributor. He resides in Altadena, Calif.

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