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Coastal Riparian Corridor between water and residential area. Photo by Judy Rondeau.

Coastal Planting Guide for Long Island Sound

Site Preparation

There are two common situations that are likely to exist for property owners when preparing a coastal area for installation of a riparian buffer planting. Often a riparian planting will be replacing an area of mowed turf grass. In other cases, riparian plantings will be replacing mixed woody and herbaceous perennial plants, most likely comprised of some native species and invasive exotic species. These two types of vegetation will need to be handled differently to successfully prepare an area for establishment of a riparian planting.

Preparation of an area of lawn grass

Most coastal riparian areas will have a slope to the landscape, since this is the area where the land gradates to the water. In some locations the slope may be quite gradual, while in others it may be very steep. To limit erosion on slopes prior to the establishment of the riparian vegetation, the best approach with lawn areas is to kill the turf, but leave it in place and plant through the dead grass residue. The leaf residue and the dead roots will continue to hold the soil in place for a period of time while the new riparian plants are installed and become established. Mulch can be applied directly over the killed vegetation if desired.

Using a non-selective herbicide

Perhaps the easiest and most effective way to kill large areas of lawn grass is to use a non-selective herbicide containing the active ingredient glyphosate (commonly known as Roundup). Glyphosate can be applied to lawns anytime there is active turfgrass growth and it will be effective at killing most

grass species and common lawn weeds. Glyphosate is relatively safe to use and does not persist or bioaccumulate in the environment, but it must have sufficient time to dry on the foliage prior to a rain or irrigation event. Once glyphosate is absorbed through the leaves of the plants it is translocated into the roots and rhizomes of grass and weeds, killing the plants completely. Before using an herbicide in close proximity to a coastal zone, be sure to check that it is legal to make herbicide applications to your coastal property. If you do not wish to use herbicide, or herbicide use is not allowed on your property, you do have some other options that can be used to kill lawn.

Using newspaper or cardboard layering

This method can be effective, but will take time to kill the grass and lawn weeds. It is also not that practical on sites with very steep slopes. Start this process by mowing the lawn as short as possible. The turf should then be covered with 8 to 10 layers of newspaper or cardboard. Choose a calm day to do this so the newspaper is less likely to blow away on you and utilize small rocks to hold the paper in place. The paper layers should then be covered with 4" to 6" of organic mulch. The organic mulch can be wood chips, bark chips, or partially composted chopped leaves. Water the mulch thoroughly to settle it and add weight to the layer. Over the course of 2 to 3 months, the vegetation will be killed off due to lack of light and air circulation. In general this method has to be employed during the growing season to be effective. Even when done correctly, it is likely that some tough, durable plants will survive the process and need to be mechanically removed. Planting of new riparian species should be possible directly through the paper and mulch layer once the old lawn has died off.

Using vinegar sprays

If you would like to use a spray, but do not wish to use a synthetic herbicide, you may be able to use vinegar to kill your lawn. The approach is usually best applied to smaller areas of turf primarily due to the cost of vinegar. The active ingredient in vinegar is acetic acid and you will want to use vinegar that has the highest available acetic acidconcentration. This is usually white or pickled vinegar, which will contain 5% or slightly higher acetic acid. To get the best results with vinegar sprays, choose a period where the forecast calls for a few consecutive days of warm temperatures and sun. Mix full strength vinegar with some dish soap (1 gal of vinegar plus 1 oz. of dish soap) to increase the efficacy of the vinegar to kill plants. Apply the vinegar on a calm day to avoid drift of the spray. It will take at least two days to begin to see the plants dying. It is likely that the vinegar spray will have to be repeated one or more times to produce acceptable results.

Using solarization

Soil solarization is a nonchemical method for killing lawn and weeds using high temperatures produced by capturing radiant energy from the sun. The method involves heating the soil by covering it with a clear plastic tarp for 4 to 6 weeks during a hot period of the year when the soil will receive the most direct sunlight. When properly done, the top 6 inches of the soil will heat up to as high as 140°F, depending on the location. The top 12 to 18 inches of soil will usually get sufficiently warm to kill turf and many weed roots and rhizomes. Solarization can only be used to kill turf that receives full sun exposure. Shaded or partially shaded lawn areas will not be killed sufficiently by solarization. Optimum conditions for control (good soil moisture, tight-fitting plastic, and high solar radiation) are needed to kill tougher plants, especially those with deep roots or rhizomes. Results from solarization can be inconsistent, even under favorable conditions. The area being treated also looks unsightly for a couple of months. When attempting solarization, first mow the grass very short, and then water it heavily to saturate the soil and cover with clear plastic sheet-

ing. Be sure to seal down the edges of the plastic so that the moisture and heat are trapped beneath the plastic.

Using mechanical removal

The quickest method of removing a lawn is to dig it out. This is a very labor intensive process, but it can be made easier using a sod cutter. This machine removes the grass and a thin layer of soil in strips. Sod strips cut from the lawn can be turned over and left in place or composted in another location. Alternatively, there are hand tools designed to cut thin layers of lawn sod from the soil. If lawn is going to be mechanically removed, riparian plants should be installed and mulched in immediately to avoid erosion which could occur to the bare soil during a significant rain event. While sod removal is a fairly complete process, it is possible that grass and weed rhizomes or roots could remain in the soil and regenerate some plants in the future. One other drawback to sod removal is that a significant amount of organic matter and topsoil can be lost with the removed sod. Frequently, coastal soils are sandy and have only a thin layer of topsoil with limited organic matter, so minimizing their loss is important.

If you choose to mechanically remove turf, there is an opportunity to add organic matter or compost to the soil if it is deficient in this area. A 3" layer of compost or peat moss can be spread over the area where the lawn has been removed and cultivated into the bare soil with a rototiller. Before deciding to add compost to the riparian planting area, be sure that the soil is very deficient in organic matter and nutrients based on a soil test. Generally adding organic matter to soils is beneficial, but it will add cost to the project, require extra labor, can potential bring in new weed seeds or propagules and have a minimal impact on the long term success of the riparian planting if properly adapted plants are selected for the site.

Preparation of an area of mixed vegetation: woody and herbaceous plants

For areas that are not in lawn, but are instead covered with a mix of woody shrubs, small trees, vines and herbaceous perennial plants, the first step is to determine if there are any plants in the area that are native and would be desirable to save and incorporate into the new riparian planting and landscape. There are many resources available that can help you identify plants on your property.

The University of Connecticut Plant Database:
www.hort.uconn.edu/plants

The Connecticut Conservation Districts:
conservect.org

The Connecticut Botanical Society:
www.ct-botanical-society.org

The New England Wildflower Society:
gobotany.newenglandwild.org

Mechanical removal of plants

One way to prepare an area containing mixed woody and herbaceous vegetation for riparian planting is to physically dig up and remove the plant material, including the underground roots and rhizomes. This can be done by hand, or using machinery. This method quickly removes the unwanted vegetation and the area is then ready for riparian plant establishment. Mechanical removal can be very labor intensive and expensive. In addition, remnant roots and rhizomes that can get left behind may regenerate plants and because the soil is disturbed during plant removal, replanting must occur immediately to avoid erosion on sloped areas.

Using non-selective systemic herbicides

Systemic herbicides are absorbed into the plant foliage and stems and are then translocated into the roots and underground portions of the plant where they accumulate and kill the plant tissue. Systemic

herbicides sprayed at the end of the summer are often most effective because this is the time of the year when plants transfers nutrients, carbohydrates and the herbicide from the foliage to the roots in preparation for winter dormancy.

The two most effective and commonly used systemic herbicides for controlling mixed perennial vegetation are glyphosate and triclopyr. With both of these herbicides it is recommended that a surfactant be used which will enhance the efficacy of the herbicide by improving coverage of the herbicide as well as its absorption. Some formulations of these herbicides will already have the surfactant included with the herbicide.

Glyphosate (Roundup®) will control broadleaf plants as well as grasses and sedges, but it may take more than two weeks for plants to die. To control woody plants and tough herbaceous perennials most effectively with glyphosate containing herbicide formulations, it is important to make applications at the end of the summer (usually mid-August through early September). Woody plants, in particular, may appear relatively unaffected by the herbicide at this time of year, but leaves will fail to emerge from buds the following spring or will be stunted and distorted. Glyphosate is rapidly deactivated and biodegraded when it contacts the soil and it presents a low environmental risk.

Triclopyr (Brush-B-Gone, Weed Killer) will control most broadleaf plants, but will not be effective against grasses and sedges. In comparison to glyphosate, triclopyr is faster acting and plants will usually show damage with 24 hours and will die within a few to several days. This herbicide is best applied to plants when they are in active growth, so earlier in the growing season (May through July) is the best time for application. In general, triclopyr will be more effective at killing woody plants than glyphosate. Formulations containing triclopyr are especially useful on freshly cut stumps to prevent resprouting. Triclopyr is also a relatively safe herbicide, but carries slightly more environmental and human risk than glyphosate.

There are different ways that systemic herbicides can be used to kill existing vegetation in an area designated for a riparian planting. Foliar sprays of an herbicide using a backpack or hand held sprayer can be very effective. Foliar sprays use a relatively diluted application of herbicide. Foliar sprays are ideally suited to areas where control is needed for herbaceous perennial plants and low growing dense brush. Spray should be applied to the leaves and stems to the drip point. It may be necessary to repeat an application to achieve complete control.

Foliar wipes is another technique where somewhat more concentrated herbicide solution is painted, wiped or swabbed on the plant foliage. Paint brushes, special wick applicators, or plastic gloves inside cloth gloves can be used to apply the herbicide to plant material in a very focused and directed fashion. Foliar wiping can be very useful to kill plants surrounding desirable plants that are to be retained. With foliar wiping there is little risk to non-target plants resulting from spray drift.

Cut stump applications of concentrated herbicide can be painted, sprayed or sponged onto cut off stumps and stems to prevent resprouting. This method is very useful for larger stem diameter plant material such as large vines, shrubs and small trees where aerial foliar sprays would produce too much spray drift and damage to non-target plants. It is often recommended to mix the herbicide with fuel oil or kerosene to make it more effective. Efficacy will be best when cut stump applications are made at the end of the summer. Repeat applications may be necessary.

Whatever process you choose, be sure to follow manufacturers safety instructions for application and storage. Eye protection and gloves are recommended.

Common invasive species encountered in along Long Island Sound and their control

A wide variety of invasive herbaceous and woody invasive plants have become established in many coastal areas. It is likely that at least some of the vegetation that will need to be controlled in preparation for installation of a riparian planting will be one or more species of invasive plant. Below is a listing of some of the most commonly found coastal invasive species and approaches that can be used to successfully control and remove them prior to installing a riparian planting.

Tree of Heaven (Ailanthus altissima) is a Chinese tree that can grow to 80' tall, with smooth gray bark, coarse branching, and large compound leaves from 1' to 4' long. There are male and female plants, with the females producing flat, twisted, winged fruits at the end of the summer. Fruits look like "leafy" clusters and may turn salmon-pink as they ripen.

Control: Young seedlings can be pulled by hand, but older plants are best handled with herbicide treatments. If trees are small enough to allow for foliar sprays then use either glyphosate or triclopyr to spray over the tops of the plants. Larger trees should be cut down and the stumps treated with a combination of triclopyr and oil to kill the stump and roots. Glyphosate treatments of Ailanthus stumps will be less effective than triclopyr. Stump treatments will be most effective if the trees are felled during the growing season and if the triclopyr herbicide is applied immediately after the tree is cut. Follow-up herbicide sprays of root suckers may be required.

Asiatic Sand Sedge or Japanese Sedge (Carex kobomugi) is a grass-like perennial sedge from northeastern Asia that is found along coastal beaches and dunes. While it has not yet been found in Connecticut or on Long Island, it is in neighboring states and definitely a plant to watch out for. It produces coarse stout stems and forms colonies that are connected by cord-like rhizomes. Terminal brown flowers may be present in April-June and are held on triangular stems. Leaves are yellowish-green with fine serrations (teeth) along the tips.

Control: Small numbers of plants can be dug out without too much effort, but care must be taken to be sure that all connecting rhizomes are also excavated at removal time. Rhizome tips are sharp, so leather gloves should be worn for this work. Glyphosate sprays are another good method of killing this species. Often two applications will be required: the first in mid-summer and the second in early fall. Follow-up the next growing season may be required.

Oriental Bittersweet (Celastrus orbiculatus) is a deciduous, perennial vine that is native to many parts of Asia and climbs by twining around objects. Leaves are somewhat rounded and alternate along the stem. There are male and female plants and fruits are produced in clusters from the leaf axils of female plants in the fall. Fruits are rounded, about the size of a pea, with the yellow capsule splitting to reveal orange arils inside.

Control: Smaller vines can be pulled by hand. It is important to remove the roots as well since bittersweet can resprout from the tops of roots that remain in the soil. Large infestations are usually best controlled with herbicide sprays and both glyphosate and triclopyr are effective. In areas where bittersweet is intermingled with desirable grasses, triclopyr should be used since it will not harm the grasses when used at appropriate concentrations. Large vines that have reached tree canopies should be cut and the stump should be treated with concentrated herbicide. The vine should be pulled from the canopy as much as possible if the tree is to be retained in the landscape.

Black Swallow-wort (Cynanchum louiseae) is an herbaceous, perennial, twining vine that has opposite oval leaves with pointed tips. Small, dark purple,

five-petaled, star-shaped flowers are borne in clusters in June and July. Soon after flowering, slender tapering green pods form that eventually turn tan.

Control: Foliar sprays with either glyphosate or triclopyr are the most effective methods to control black swallow-wort. Wait until plants have begun flowering before making an herbicide application. Because black swallow-wort grows in dense, layered thickets it is likely that a second herbicide spray application will be needed later in the summer or early fall if there is regrowth from lower layers of the vine. An alternative herbicide approach is to cut and remove the vines and immediately treat the cut stumps with concentrated herbicide. Glyphosate is more effective for cut stump treatment than triclopyr. Pulling and manual removal of this species is rarely an effective or practical approach.

Japanese Honeysuckle (Lonicera japonica) is a perennial vine that can climb by twining around structures or grow as a groundcover, scrambling over anything it encounters. Its oval or slightly lobed leaves are tardily deciduous in Connecticut and New York, but can remain semi-evergreen or totally evergreen in warmer coastal locations. Leaves are opposite each other along slender stems. Tubular, fragrant flowers change from white to yellow with age and are highly visible from May through July.

Control: Plants can be dug out of the soil, but it can be very difficult to completely remove all roots and underground rhizome pieces. Follow-up checks for sprouting will be necessary. Foliar sprays of either glyphosate or triclopyr are effective at killing both the above and below ground portions of Japanese honeysuckle. Late summer and fall are good times to apply herbicide since it will be readily translocated to the underground plant parts at this time of year. Since Japanese honeysuckle is so slow to lose its leaves at the end of the growing season, herbicide sprays can be made later in the fall than for many other woody plants. At this time of year, non-target plants are likely already dormant and leafless and will be relatively unaffected by the sprays.

Black Locust (Robinia pseudoacacia) is a fast growing tree that typically reaches 40’ to 60’ tall. Young trees have smooth gray bark that gives way to deeply furrowed bark with flattened ridges. Leaves are compound, with many small, oval leaflets and are held in an alternate arrangement along the stem. Pairs of thorns can be found where leaves join the stem. Pendulous clusters of fragrant, white flowers with a yellow blotch in the upper petal are produced in late May to early June. Fruits are 2” to 4” long smooth, flattened pods.

Control: Black locust very readily suckers from roots, so digging out trees often leaves roots behind that resprout colonies. The most effective method of eliminating black locust is to cut the trees down and immediately treat the cut stump with fairly strong glyphosate or triclopyr solution. Stumps treated with herbicides that appear to be dead may still produce new root shoots a few years later. Follow-up herbicide treatment of new root suckers may be needed.

Rugosa Rose, Beach Rose, Japanese Rose (Rosa rugosa) is deciduous, suckering shrub that is typically 4’ to 6’ tall with an equal or greater spread. Stems are stout and covered with straight, sharp spines of varying lengths. Compound leaves are alternate, and have 5 to 9 leaflets that are dark green on the upper surface, fairly thick and show embossed veins. Flowers are 2.5” to 3.5” across, produced from June through August, are fragrant and may be white, pink or rose and either single or double. Fruits are flattened, round hips that ripen to a shiny orange-red at the end of summer.

Control: Small numbers of young plants can be dug out by hand or with machinery. Since they sucker readily and produce rhizomes, it is important that no underground plant parts are left behind or they may regenerate. Glyphosate foliar sprays are effective if applied after the plants are done flowering. Triclopyr foliar sprays are also effective and can be

applied earlier, either before or during flowering. An alternative herbicide method is to cut off the shrubs and immediately apply concentrated glyphosate to the stumps.

For information on having your soil tested contact:

University of Connecticut Soil Nutrient Analysis Lab: www.soiltest.uconn.edu/sampling.php

Connecticut Agriculture Experiment Station Soil Testing Lab: www.ct.gov/caes/cwp/view.asp?a=2836&q=378206

Website: clear.uconn.edu/projects/crig

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