

Why shore zones?

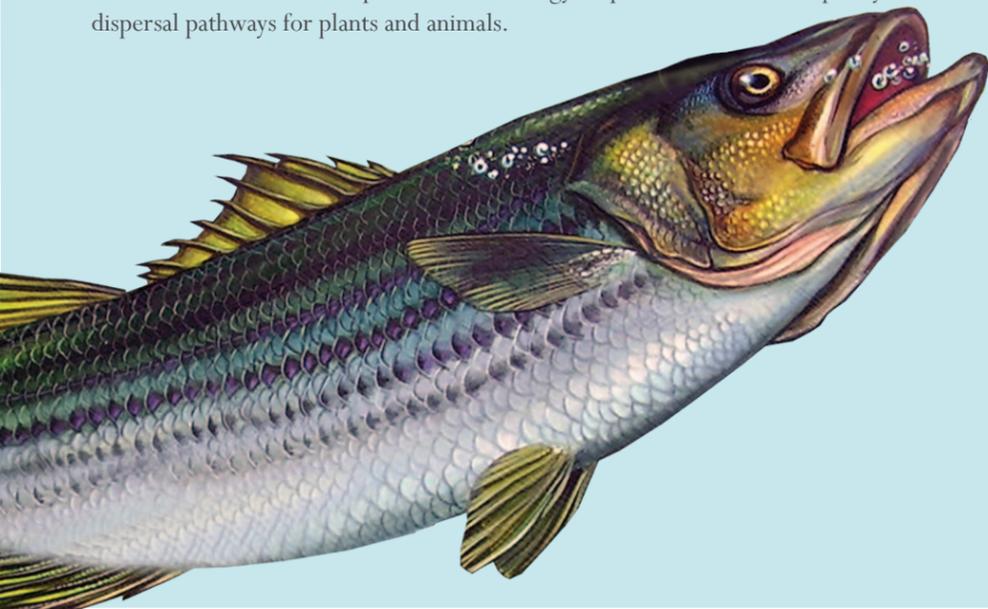
The shore zone is the place where land and water meet. It includes the shallow waters offshore, the vegetation or human structures on land, and the shoreline itself. Shore zones contain high ecological diversity and value, and have been used and esteemed by people for thousands of years. Careless human uses have badly damaged many shore zones. The shore zone is also a region that will be heavily affected by the coming changes in climate, as sea level rises, and changes in temperature and rainfall cause inland shorelines to advance or recede. As we move forward, it makes sense to try to preserve or enhance the ecological value of shore zones as much as we can while still meeting human needs.

Human uses of the shore zone

Shore zones are vitally important to humans. Since the beginning of civilization shore zones have been used for transportation; agriculture; a source of water; waste disposal; a place to harvest plants, animals, and geologic resources; recreation; aesthetic and spiritual inspiration; and desirable sites to build homes, businesses, and factories. As shoreline development has increased, so has the desire to build protective structures (seawalls, dikes). Unfortunately, many of these activities reduced the ability of shore zones to support plants and animals and provide ecological services such as water purification and flood abatement. In the Hudson, about half of shore lines are artificial (riprap and bulkheads), and most of the “natural” shorelines have been shaped by human activities such as invasive species, boat wakes, and pollution.

Shore zone ecology 101

Shore zones can be among the most valuable habitats on our planet. They contain an extraordinary diversity of plants and animals, including many species that live nowhere else. Shore zones are boundaries between land and water ecosystems, and contribute to the healthy functioning of both. The physical structure and vegetation of the shore zone protect the land from erosion. Healthy shore zones provide many benefits: habitat for many species, recreation and harvestable resources for people, high plant production that provides food for animals on the land and in the water, capture of nutrients and toxins from the land, absorption of wave energy, improvement of water quality, and dispersal pathways for plants and animals.



Effects of a changing climate

Scientists believe that sea level in the Hudson probably will rise by 1-2 feet (and perhaps more than 4 feet) by the year 2100. This will cause coastal shorelines to move inland, and flood more frequently and severely. Climate change will challenge us to maintain human infrastructure and uses of shore zones without further damaging their ecological function. Because the infrastructure that we build lasts for decades or more, we need to plan for these changes now.

Managing Shore Zones for Ecological Benefits

A guide for shore zone managers and users for protecting the ecological benefits that healthy shore zones can provide.

The “Shorelines Project” is a joint project of the Hudson River National Estuarine Research Reserve (HRNERR) and its partners. It is supported by National Oceanic and Atmospheric Administration (NOAA) and National Estuarine Research Reserve (NERR) Science Collaborative.

Visit our website at:

www.hrnerr.org/public/SustainableShorelines/SSIndex2.html

Ten steps to better shore zones

1. Preserve physical diversity

Complex habitats usually support more species and ecological functions than those that are simple. Resist the urge to grade everything smooth, use the same materials everywhere, and build straight shorelines. Shore zones that have uneven topography, varied soils and vegetation, and irregular shorelines are likely to provide better ecological value.

2. Resist tidiness

“Debris” such as driftwood and windrows of vegetation along the shore provide perching spots for birds, cover for fish and other animals, nursery areas for young plants and animals, and food for the little animals that feed birds and fish. It’s ok to pick up garbage like plastic, paper, and glass, but messy shore zones are better for ecological function than shore zones that look like Martha Stewart’s living room.

3. Don’t squeeze the shore zone!

It seems obvious that if you squeeze the shore zone out of existence by dredging or filling the shallows and wet areas, building vertical walls, and destroying vegetation, you will eliminate its ecological value. However, that’s just what people have been doing for thousands of years. So don’t.

4. Prevent pollution

Pollution released into the shore zone can both damage the shore zone itself and easily move into nearby waters. Try to avoid land uses in and adjacent to the shore zone that could release or spill pollutants. It’s also a good idea to use as little fertilizer and pesticide as possible in the shore zone.

5. Reduce wave damage

Large waves, whether from the wind or passing boats, can damage shore zones. Offshore dredging and shoreline hardening can increase wave damage by removing the natural structures that absorb wave energy. Reduce the damaging effects of waves by limiting these activities, and consider imposing no-wake zones near sensitive shorelines.

6. Tread lightly

Shore zones are popular places for fishing, swimming, bird-watching, boating, hiking, and other recreational activities. Unfortunately, these activities can sometimes damage shore zones by frightening away animals, trampling plants and animals, and eroding shores and soils. So watch for signs of overuse, consider protecting parts of your shore zone as refuge areas where human activities are restricted, or prohibit some activities during sensitive times such as breeding seasons.

7. Don’t make dead ends

Animals (and plant seeds, too) use shore zones as highways when they’re migrating, seeking sites to nest or feed, or recolonizing areas that were disturbed by nature or humans. When we put sterile habitat like a seawall or a parking lot along the shore, or build walls or roads that keep animals from moving between the water and the land, we block those highways and so damage shore zone biodiversity. Try to preserve continuity of habitat along the shore zone both above and below the water line, and avoid building walls, curbs, and other barriers that block shore zone animals

8. Don’t make it so hard!

Many natural shore zones are made of a mixture of materials, including “soft” materials such as sand, mud, and gravel, often covered with vegetation. Humans frequently replace such soft materials with large stone, concrete, or steel. These hard materials change habitats and reflect waves, leading to erosion offshore and on adjacent properties. Where possible, try not to replace naturally soft shores with hard materials, and try to soften existing hard shorelines.

9. Give the shore room to move

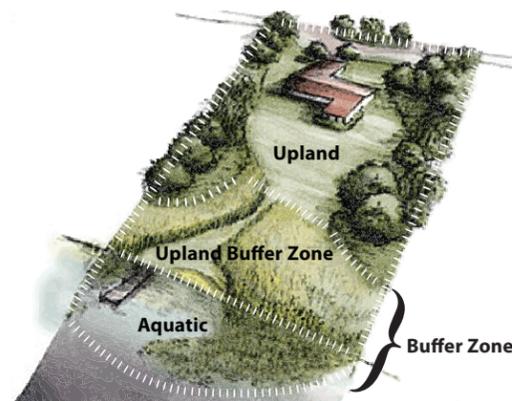
If you hem in a shore zone by building right up to its edges, it will be squeezed away when water levels rise. This will reduce or eliminate its ecological value, so wherever possible, give shore zones room to move. Because we’ve already hemmed in many shore zones with homes and other valuable infrastructure, this will be hard to do for many sites. But where it is possible, this is an important strategy to preserve ecological functioning in the face of rising water levels in the coming century.

10. Be careful about building in the shore zone

If you must build in the shore zone, reduce ecological impacts by using permeable materials that let water soak into the ground, minimizing roads, walls, and curbs that block animal movement, and limiting bright lights that attract emerging aquatic insects.



Tidy, structurally simple shore zones like this one offer little habitat for plants and animals, and may be inhospitable to animal migration.



Leaving intact vegetation above and below the water line provides good habitat for plants and animals.



Vertical walls can block animal migrations and reflect wave energy, and should be avoided.



Nature trails and parks may be better uses of the shore zone than buildings and hard structures.