

The Virginia Wetlands Report

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Preserving The Bay's Living Shorelines A Growing Grass-roots Effort

By Tom Barnard

The shores of the Chesapeake Bay, and in particular the myriad of smaller creeks and guts that run inland off its four major rivers, have for thousands of years been buffered and protected from the forces of erosion by communities of salt tolerant grasses, sedges and shrubs, collectively called tidal marshes. At the same time, these natural communities have served important ecological functions, as nurseries, habitat and primary food source for valuable bay fauna such as fishes and blue crabs. They also serve to filter sediments and other pollutants running off the adjacent uplands.

With the development of the bay watershed over time, land use has changed and forested upland buffers have been replaced by farms, housing developments, industries, marinas and other forms of economic growth. Growth has changed the bay landscape and led to significant loss of living resources over time, including non-tidal wetlands and tidal fringing marshes. Unfortunately, these anthropogenic losses have occurred concurrently with sea level rise which has served not only to increase natural shoreline erosion rates and marsh loss but also lead to accelerated attempts by homeowners to protect their upland and thus further exacerbate shoreline marsh losses.

Only relatively recently have scientists demonstrated many of the ecological functions performed by these natural shoreline communities and, in

particular, the complex interrelated nature of the upland and aquatic systems. However, the "armoring" of the shoreline against erosion, with the accompanying loss of most of the living aspects of the shoreline, continues at an ex-



Erosion control using low profile rock riprap with planted marsh.

remely high rate. In 2002 and 2003, the Commonwealth of Virginia permitted construction of shoreline erosion control structures along 14.4 and 17.7 miles of bay shoreline, respectively. These numbers alone are alarming but VIMS' data further indicate that over the last ten years, Virginia has permitted the "hardening" of an average 18.5 miles of shoreline per year (VIMS Shoreline Permit Data Base).

Much of this shoreline loss is unnecessary or structurally over-designed for the level of erosion involved. Purely structural approaches tend to cut off the connections and natural interac-

tions between the upland riparian environments (e.g. the forested buffer) and the marshes, tidal flats and shallow water habitat. This, in turn, can lead to the drowning of fringe wetlands as sea level rises and the marsh can not move landward (up slope) or trap sediments running off the land, to compensate for the rising water levels. The eventual result is that the marsh is drowned and lost from the system. There are alternative approaches available which utilize "softer" more natural shoreline treatments or incorporate aspects of the living landscape while minimizing engineered, structural erosion control.

Many shorefront landowners are unaware of these techniques and would prefer a natural shoreline to hardened shorelines such as stone revetments or bulkheads.

Private waterfront property owners collectively control the majority of Maryland and Virginia's shoreline and thus, represent a significant opportunity to improve the water quality and habitat of the Chesapeake and Coastal Bays. For this reason, a **Living Shorelines Stewardship Initiative (LSSI)** has been set in motion.

Originally begun in Maryland with funding from The Keith Campbell Foundation for the Environment, the initiative has grown into a bi-state, multi-agency collaborative effort involving the states of Maryland and Virginia. Funding now is also being provided by the Maryland Department

of Natural Resources and the Chesapeake Bay Trust. Supporting the initiative presently are Anne Arundel County, several federal agencies, independent contractors, university research groups and non-governmental environmental organizations. The overall goal of the Living Shorelines Stewardship Initiative is to improve water quality and enhance habitat for living resources in the Chesapeake Bay through the shoreline management efforts of individual waterfront property owners. Key strategies to reaching the

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Program Director:

Dr. Carl Hershner

Head, Wetlands Advisory Program:

Thomas A. Barnard, Jr.

Produced by:

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goal include: using science to drive appropriate types of, and locations for “living shorelines” treatments; and facilitating the institutionalization of living shoreline approaches through contractors and shoreline management policy makers. The ultimate desired outcome is to have: “Maryland and Virginia shorefront property owners routinely consider and frequently choose living shoreline alternatives as their preferred shoreline management treatment.”

These “softer” more natural shoreline treatments involve the use of marsh reestablishment, beach nourishment and low profile rock structures combined with biotic elements such as marsh toe protection and shallow water sills as well as the use of properly employed organic materials such as fiber logs. Besides attenuating shoreline erosion, these treatments facilitate natural coastal functions and processes such as nutrient recycling, sand and sediment deposition, the movement of detritus within the littoral zone and the protection of the natural shoreline habitat. These treatments may not be appropriate for all shorelines, high energy beaches for example, but where they can be utilized, the discerning property owner may benefit from reduced costs, creating or maintaining habitat and conditions that contribute to maintaining and restoring water quality along with important Chesapeake Bay habitats.

The University of Maryland Center for Environmental Studies (UMCES) Horn Pt. Lab has received funding from Maryland Department of Natural Resources and the Chesapeake Bay Trust to conduct a detailed field assessment and documentation of 8 shoreline erosion control projects in Maryland which incorporate marsh creation or protection as a key element of the design. The team, which will also include experts from Virginia and Maryland funded by the Campbell Foundation, will evaluate a variety of factors that may vary from site to site. Factors to be assessed may include:

Physical Effectiveness Assessment Factors:

- ◆ Shoreline wave exposure/fetch.

- ◆ Physical integrity of original design including configuration and placement of original materials.
- ◆ Changes in elevations and slope of fill containment area, displacement of structural features (stone groins, sills, breakwaters etc.).
- ◆ Changes in shoreline profile nearshore, shore zone, bank erosion or deposition on-site, updrift & downdrift areas.
- ◆ Design features in relationship to wave climate, reach characteristics, shore type and substrate composition.
- ◆ Variations in treatment type designs, maintenance & other factors affecting results.

Biological Effectiveness Factors:

- ◆ Emergent wetland plant community characteristics species composition (tide-range variable), width of marsh, percent cover, plant height.
- ◆ SAV historical presence, species, percent cover, canopy height, flowering, maximum depth of distribution.
- ◆ Associated fauna use of the site by birds, reptiles, invertebrates etc.
- ◆ Habitat suitability water quality (dissolved inorganic nitrogen and phosphorus), epiphytic loading.

The Virginia Institute of Marine Science (VIMS) has been funded by the Keith Campbell Foundation for the Environment to conduct field surveys in Virginia focusing on the effectiveness of existing low profile marsh toe protection structures identified through their Tidal Shoreline Permit Data Base. The assessment team will use many of the same criteria, listed above, to develop a site-specific profile of each marsh toe structure and photographic exhibits that will be used to produce presentation materials for a spring 2005 workshop. The workshop will be sponsored by the National Estuarine Research Reserve System and the Center for Coastal Resources Management at VIMS and should be of interest to marine contractors, waterfront property owners, environmental consultants,

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Celebrating a Wetland Wildflower

Seashore Mallow *Kosteletzkya virginica*

Virginia's Wildflower of the Year - 2004

By Karen Duhring

The Virginia Native Plant Society (VNPS) has declared the seashore mallow *Kosteletzkya virginica* to be Virginia's Wildflower of the Year for 2004. The Virginia Native Plant Society advocates community understanding and appreciation for native plants and natural habitats. Members of the organization can nominate any non-invasive, native plant each year. According to their web site, the Wildflower of the Year should ideally tie into the VNPS emphasis on habitat. Each winner also has unique characteristics that interest people, such as attractive color, abundance, rarity or other feature.

The 2004 winner, seashore mallow *Kosteletzkya virginica*, certainly fits the qualifying criteria perfectly. The award announcement accurately describes it as a "common summer highlight of the marshes in the Tidewater region...", "...identifiable even from a speeding car" and it "brightens the way of all who dare to slog through the muck of the marshes." Another natural history summary described seashore mallow and other mallows as "a real showcase" of the marsh.

Also known as Virginia salt-marsh mallow, seaside mallow, marsh mallow, and pink mallow, seashore mallow is found in brackish wetlands, salt-marshes, ditch banks and tidal riparian areas. No matter what interchangeable names are used, this pink wildflower is indeed a recognizable symbol for this important coastal habitat.

Seashore mallow shares a unique distinction with four other previous Wildflower of the Year winners - *Hamelis virginiana* (witch hazel - 2002), *Chionanthus virginicus* (fringe tree-1997), *Claytonia virginica* (spring beauty-1990) and *Mertensia virginica* (Virginia bluebells-1989). The Latin names for these wildflowers include a derivation of "Virginia" because they



were originally discovered here or they mainly occur in the Mid-Atlantic region. Seashore mallow also occurs on the outer coastal plain from Long Island to the Gulf of Mexico.

Botanical Interest

Kosteletzkya virginica is a member of the cotton family, *Malvaceae*, which includes more than 1,000 species. The original source of paste used to make the confection "marshmallow" came from the root of another member of this family, the European marsh mallow *Althaea officinalis*. This wetland namesake is no longer an ingredient in modern marshmallow treats.

Seashore mallow is an herbaceous perennial. It disappears below ground in the fall then appears in late spring and grows 3-5 feet high. Dainty flowers 2-3 inches long are visible from July through September. The pink blooms

are a vivid contrast to the sea of green in the summer marsh formed by grasses, rushes and sedges. Descriptive terms like hot pink, bright pink, and rosy pink parade are used to portray the visual effect of seashore mallow blooming in a salt marsh.

Hibiscus moscheutos, sometimes called marsh hibiscus or rose mallow, is another coastal mallow that grows in similar habitats and blooms at the same time as *Kosteletzkya virginica*. Seashore mallow can be distinguished from *Hibiscus* mainly by the size of the leaves and flowers. The flowers and general habit of *Hibiscus moscheutos* are noticeably larger.

Ecological Interest

While people derive visual pleasure, seashore mallow also serves its own purpose as a member of a functioning marsh community. Its value as a food source for wildlife is limited, but as an herbaceous perennial it contributes to the overall species diversity and primary productivity of the marsh. It also participates in valuable water quality functions through sediment trapping, uptake and storage of nutrients, as well as reducing the flow rate and energy of stormwater runoff and floodwaters.

Horticulture

Even though it grows naturally in brackish marshes, it is possible to propagate and grow seashore mallow in the home garden. This plant needs full sun and rich, fertile soil with lots of organic matter. The soil should be kept evenly moist. It is highly suitable for rain and water gardens, creek and pond edges and other shorelines. As a coastal plant, it is also tolerant of wind blown and soil borne salt.

The Virginia Native Plant Society suggests mixing seashore mallow with

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Snakehead Invades Potomac River

Having already established a reproducing population in Broward County, Florida, the Asian fish known as the Northern Snakehead is now being caught by fishermen and state wildlife managers in a freshwater section of the Potomac River. It is too early to say that this is a reproducing population but concern about the potential adverse impact of this invasive species grows each time another specimen is reported. Here is the latest information from the Virginia Department of Game and Inland Fisheries.

As of July 9, 2004, the number of northern snakehead fish caught in the Potomac River is rising. A fisheries biologist with the Virginia Dept of Game and Inland Fisheries (VDGIF) caught the 14th fish while electrofishing in Dogue Creek. That fish came in at just over 16 inches in length. Fish number 13, which was caught at the same location, measured just over 17 inches in length and was a mature female full of eggs. This is the second female with eggs that has been caught. The other was caught on June 23 in Little Hunting Creek.

All have been caught in a 14-mile stretch of the Potomac River. Five snakehead fish have been caught in Dogue Creek and three have been

caught in Little Hunting Creek so far. All have been caught in shallow, grassy water. Like the earlier specimens, these fish will be taken to the Smithsonian Institution for genetic testing. Fisheries biologists are conducting additional tests to determine age and sex of the fish.

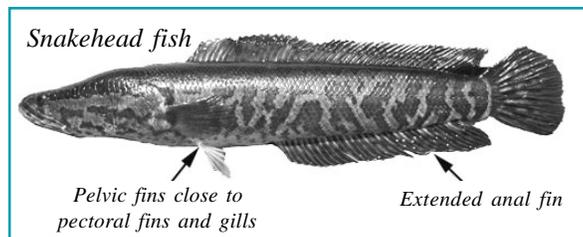
Virginia Department of Game and Inland Fisheries, Maryland Department of Natural Resources and the U.S. Fish & Wildlife Service are coordinating their efforts to confirm if there is an established reproducing population of northern snakehead fish in the Potomac River. Some anglers who caught snakehead fish reported seeing a second adult fish in the area where they caught their fish. Fisheries biologists have also observed additional adult snakehead fish in the water while sampling these areas. These sightings may indicate that some adults are spawning; however, at this point, no

nest sites, eggs, or young-of-the-year fish have been found.

Northern snakehead fish are an invasive species and a top-tier preda-

Snakehead Fish Facts

- As a family, snakeheads are native to parts of Asia and Africa. The northern snakehead is native to China, and possibly Korea and Russia.
- Typically found in a wide variety of habitats
- Northern snakeheads grow to a maximum length of about 33 inches
- Generally tan in appearance, with dark brown mottling; body somewhat elongated; long dorsal fin; jaws contain numerous canine-like teeth (similar to pike or pickerel)
- Capable of breathing air using an air bladder that works as a primitive lung (not found in most fish)
- Able to hibernate in cracks and crevices during cold temperatures and to go dormant in the mud during droughts
- Voracious top-level predator, eating mostly fish, but also eats other aquatic wildlife and frogs
- Capable of moving short distances on land using its pectoral fins; can live out of water for as many as three days
- Favored as a food fish throughout southeast Asia; also believed to have curative powers. Also sold in the aquarium trade.
- Four species have been found in the U.S., in eight states, probably the result of releases from personal aquariums or to develop local food sources
- No natural predators in the U.S.



tor in the ecosystem. If a population were successfully established, it would disrupt the ecosystem in the Potomac River by displacing native fish and competing for habitat. Northern snakeheads prefer shallow vegetated waters and do not tolerate saltwater.

The VDGIF reminds anglers that they remain the best source of information regarding the collection of these exotic fish. Anglers are asked NOT TO RELEASE a suspect fish, but to kill it humanely with a blow to the head and to get it on ice as quickly as possible. Anglers should report their catches to authorities immediately: Call the Virginia Department of Game and Inland Fisheries in state, toll-free at 1-800-770-4951. Out-of-state callers reporting snakehead fish caught in Virginia waters should call directly to 804-367-1258.

ID #	Date Caught	Location	Length	Method
1	May 7, 2004	Little Hunting Creek (VA)	12.59 inches	Angler, hook & line
2	May 8	Marshall Hall (MD)	12	Angler, hook & line
3	May 15	Occoquan Bay area (VA)	13.26	Angler, hook & line
4	May 27	Pohick Bay (VA)	14.48	Comrcl. waterman, seine net
5	June 3	Dogue Creek (VA)	14.37	Biologist, electrofishing
6	June 17	Little Hunting Creek (VA)	24.96	Angler, hook & line
7	June 23	Little Hunting Creek (VA)	14.88	Biologist, electrofishing
8	June 24	Mattawoman Creek (MD)	17.51	Angler, hook & line
9	June 27	Kane Crk, Belmont Bay (VA)	17.71	Angler, hook & line
10	July 3	Dogue Creek (VA)	14.88	Angler, hook & line
11	July 5	Dogue Creek (VA)	17.83	Angler, dip net
12	July 8	Pomonkey Creek (MD)	17.99	Angler, hook & line
13	July 8	Dogue Creek (VA)	17.24	Angler, hook & line
14	July 9	Dogue Creek (VA)	16.33	Biologist, electrofishing



Beaks & Bills

Dunlin (*Calidris alpina*)

by Julie G. Bradshaw

On your next foray to the Outer Banks or Eastern Shore beaches and mudflats, keep an eye out for the Dunlin, one of our most common shorebirds. Dunlins are small sandpipers, a bit larger than Sanderlings, and are most easily identified in their summer plumage, when they have a distinctive black belly and rusty back. In winter, they are difficult to identify because they are, like many shorebirds, a nondescript gray above and white below. However, they differ from other shorebirds by their relatively stocky bodies and somewhat hunched, no-neck posture, and by a bill that's a little bit longer than other sandpipers', and is slightly down-curved at its tip.

Dunlins occur in Virginia during all but the breeding season. They can be found, often in very large flocks, on beaches and mudflats. They are one of the last shorebird species to migrate from their breeding grounds in the Canadian and Alaskan tundra. In Virginia, Chincoteague National Wildlife Refuge and Cape Charles are areas where they concentrate during fall migration. Dunlins can be found feeding in the intertidal zone and in water up to 2 inches deep. They eat marine invertebrates such as polychaete worms, small clams, snails, and amphipods, which they find by shallow probing in the sand or mud. Individuals have often been observed probing with an open bill. Researchers speculate that the open bill probing might allow the birds' taste buds to help them find food. The probing behavior of Dunlins has been said to resemble the movement of a sewing

machine. Scientists have determined that the birds' bills penetrate less than ¼ inch into the sand or mud. Dunlins are one of six main shorebird species that use Delaware Bay beaches and feed on horseshoe crab eggs there, although they seem to not be as dependent on this food source as Red Knots.

The Dunlin is one of three species of shorebirds that are considered indicators of the health of northern hemisphere ecosystems.

The main source of mortality of Dunlins is thought to be predation by falcons and other raptors during the winter. However, loss of wetland habitat for breeding and wintering, and declines in food sources such as horseshoe crab eggs are also significant causes of declining Dunlin populations.

This article marks the second in what is planned to be an ongoing series on birds that use the wetlands and coastal resources of Virginia. Images of the Dunlin and the subject of the first article, the Hooded Merganser, appear in the masthead (above). The title of

the series, "Beaks and Bills" initiated some interesting discussion here in the office, as different impressions of these two terms unfolded. Ornithologically speaking, all birds have bills. These bills are also referred to as beaks in birds of prey such as eagles and hawks. Please forward any questions, comments, or suggestions for this column to the author at jlueb@vims.edu.

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wetlands boards and shoreline regulators as well as non-governmental environmental organizations (NGO).

Depending on how successful the initial steps of the Living Shorelines Stewardship Initiative are in Virginia, organized shorefront property owners may be eligible to apply for grants such as has occurred with the South River Federation in Maryland. They have partnered with the Chesapeake Bay Foundation and others in applying for a

grant to enable the production of a "South River Living Shoreline and Estuarine Habitat Restoration Framework." Once developed, this framework will be part of an overall strategy to educate landowners to the benefits of natural shoreline management options and to consider their use. The emphasis at present is to demonstrate the effectiveness of these "living" approaches to shoreline erosion control and then to get the word out to property owners.

David Burke, LSSI manager, contributed to this article.

Calendar of Upcoming Events

July 21, 2004	VIMS Tidal Wetlands Seminar. VIMS' Center for Coastal Resources Education, Gloucester Pt., VA For additional information, contact: Dawn Fleming at (804) 684-7380 or dawnf@vims.edu
August 3-6, 2004	Hydric Soils Workshop. Norfolk, VA. Contact: Ralph Spagnolo, spagnolo.ralph@epa.gov
September 12-15, 2004	2nd National Conference on Coastal and Estuarine Habitat Restoration. Seattle, Washington. Call: (703) 524-0248.
September 19-24, 2004	23rd Annual International Submerged Lands Conference. Halifax, Nova Scotia, Canada. For information call 902-424-3160 or <slmc@gov.ns.ca>
October 25-28, 2004	7th Annual Wetlands Workshop. Atlantic City, NJ. The Protection of Aquatic Ecosystems Using Watershed-based Approaches. Contact: Frank J. Reilly, Jr. 540-286-6072 or <Frank@wetlandsworkgroup.org>

Marsh Mallow
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early spring blooming plants that die back in midsummer. Other suitable native species to combine with sea-shore mallow include grasses, sunflowers, boltonia and goldenrods, especially those with a similar preference for wet soils. Native plants used in the home garden should always be nursery-propagated, not collected from the wild.

Join in the Celebration

The seashore mallow deserves to be recognized as Virginia's Wildflower of the Year for 2004. Join in the celebration, explore and discover a coastal wetland this summer.

Visit the Virginia Native Plant Society web site (www.vnps.org) to read a complete description and to view previous winners. A list of retail sources of nursery-propagated plants and responsibly collected seeds is also available.

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New and Interesting Web Sites

www.nos.noaa.gov

The featured web page for this issue of the VWR is one that all who work with shorelands and wetlands should find useful and interesting. The address shown above is that of the National Ocean Service. Here one can find information, news and links to all manner of web sites dealing with coastal issues and projects.

Want information on sea level rise in Chesapeake Bay? Click on "Sea Levels on Line." Want to know when high or low tide is predicted to occur today or in the future? Go to "Tidal and Current Information." Interested in real time tide heights compared to predicted? Go to the "Center for Operational Oceanographic Products Services" (Co-ops).

Maybe your interests go more toward coastal habitats, their protection and restoration. Or maybe "smart growth" or coastal hazards increase your pulse rate. If so, click on the Coastal Services Center.

One can also find information on coral reefs, National Marine Sanctuaries, nautical charts and marine resource economics.....enjoy!

www.ocean.udel.edu/horseshoecrab

This newsletter has featured in past issues the plight of the horseshoe crab

and the management efforts taking place in several mid-Atlantic coastal states. Now there is a new web site for the critter that is really more closely related to spiders, ticks and scorpions (arachnids) than crustaceans. It turns out that the horseshoe crab is Delaware's state marine animal and the web site is produced by the University of Delaware Marine Public Information Office in cooperation with Sea Grant programs throughout the mid-Atlantic.

The new site discusses in a very interesting fashion all aspects of the Critter's existence which is complicated by a myriad of factors, including its shorebird connection, human use (medical) and fisheries management efforts. The site also features the history and biology of the animal, where it spawns, a variety of other fun facts and where you can go for more information.

www.floatline.com

Another new web site; this one is designed to be a clearing house for news items and any and all information pertaining specifically to Chesapeake Bay activities. Here is listed special events, ongoing environmental and political issues and items pertaining to the health of the Bay. The site is to be kept updated on a regular basis and should be an excellent resource for Bay enthusiasts.