

The Virginia Wetlands Report

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Annual Summary of Permitted Tidal Wetland Impacts - 2003

By Karen Duhring

The VIMS Center for Coastal Resources Management has maintained a database since 1988 to track cumulative impacts to Virginia's marine resources through the Center's advisory activities. Scientists conduct site visits to properties where a Joint Permit Application (JPA) has been submitted for projects that impact tidal wetlands, subaqueous bottom and coastal primary sand dunes and beaches. Each project assessment includes estimates of impact areas and recommendations for avoiding or minimizing these impacts. The database is intended to provide information about the potential environmental results of the regulatory permit process. It does not track the actual impacts that occur as a result of project construction or completion.

This annual summary is limited to tidal wetlands only. The projects included for this report all had a final permit decision made in 2003 by local wetlands boards and the Virginia Marine Resources Commission (VMRC). The linear extent of shoreline hardening for erosion control will be reported. An unusually large tidal wetland impact area will be explained by comparing different project activities. The extent of tidal wetlands permanently lost as a result of "fill" will be compared to the amount of mitigation wetlands required to compensate for this loss.

The past year of tidal wetland reviews was particularly active, with several large public projects and the aftermath of Hurricane Isabel. A total of 1069 Joint Permit Applications (JPAs)

were reviewed in 2003, which is a slight increase from previous years. The following information is based on 973 of these cases with final permit decisions made in the same year.

Shoreline Miles

Approximately 17.7 miles of new erosion control structures were approved in 2003 using sloped revetments and vertical bulkheads. This is 3 additional miles compared to 2002 (14.4 miles), although a similar number of applications were approved. The total miles for 2003 is comparable to 18.5 miles, which is the annual total averaged over the past ten years. The preference for sloped revetments continued to be apparent, with 72% of the new shoreline hardening attributable to these structures in 2003. Another 8.7 miles of erosion control structures were approved to replace or reinforce existing,

failing structures. This does not include authorized emergency repairs to structures that were destroyed or damaged during Hurricane Isabel (Figure 1).

"Impacts" vs. "Fill"

Some activities and associated impacts do not permanently remove tidal wetland areas from the marine environment. These "impact" areas are distinguished from "fill" areas that result in the permanent loss of tidal wetlands through conversion into upland habitat. For example, beach nourishment and the aquatic disposal of dredged material are the two activities with the largest tidal wetland impact area for 2003, but these "impacts" do not have associated "fill" areas under this definition. These activities only result in a temporary alteration or conversion from one type of marine habitat to another.

Permitted Impact Area

Since 1993, the tidal wetland impact area permitted each year has been about 42 acres. At first glance, the reported amount for 2003 seemed to be erroneous because, according to the database, over 136 acres of tidal wetland impacts were authorized in 2003. The permitted impacts include 24 acres of vegetated tidal wetlands and 112 acres of non-vegetated tidal wetlands, the largest amounts reported in the past eleven years (Figure 2, next page). Further scrutiny revealed which projects were responsible for such a large permitted impact area.



Figure 1. Major erosion and damage to shoreline structures and piers as a result of Hurricane Isabel.

Almost 90% of the permitted tidal wetland impact area in 2003 can be attributed to two activity types - beach nourishment projects (77 acres) and aquatic disposal of dredged material (43 acres). Most of the beach nourishment impact area (60 acres) can be assigned to nine large public projects approved in the Cities of Norfolk, Virginia Beach and Hampton, as well as Mathews County and York County (Figure 3). Another 16 acres of beach nourishment impacts are associated with erosion control projects using sand in combina-

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tion with gapped offshore breakwater structures. This shoreline stabilization approach has become more popular in recent years.

Normally, the aquatic disposal of dredged material impacts subaqueous bottom and not tidal wetlands. The 43 acres of tidal wetland impact associated with aquatic disposal are almost entirely because of two federal projects approved in 2003 on Virginia's Eastern Shore. The permitted impact area at the Burtons Bay project includes 23 acres of mud flat wetland. The Bogues Bay project includes spray dredging material over 20 acres of vegetated marsh, which solely accounts for the elevated impact area to vegetated tidal wetlands in 2003.

Erosion control structures accounted for most of the remaining impact area, including revetments (7.4 acres), bulkheads (1.4 acres), and bulkhead toe revetments to stabilize failing bulkheads (1.2 acres). This impact area is similar to previous years in spite of Hurricane Isabel because emergency repairs are not included. The permitted impact area associated with new erosion control structures may increase dramatically in 2004 as a result of property owners deciding to protect their shorelines from future catastrophic events.



Figure 3. Large public beach nourishment projects accounted for most of the permitted tidal wetland impact area in 2003.

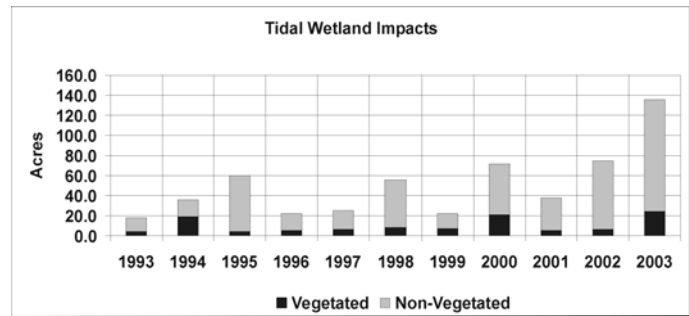


Figure 2. Tidal wetland impacts permitted annually in Virginia.

Permitted Fill Area

The estimated “fill” area permitted in 2003 is 7.8 acres, compared to an “impact” area of 136.2 acres. While erosion control structures accounted for a relatively small percentage of the total impact area, they account for almost all of the “fill” area permitted in 2003. The largest fill amounts by activity include revetments (4.2 acres), bulkheads (2.0 acres), and general fill (0.9 acres). The permitted fill area for 2003 is less than the average annual amount, which has been about 11.8 acres.

Tidal Wetland Mitigation

Tidal wetland mitigation was associated with seven projects in 2003, out of the 973 cases analyzed for this summary. The total area of mitigated tidal wetlands captured by the database was 2.2 acres. This amount is slightly higher than the annual average during the past decade of about 1.8 acres. The tidal wetlands database only tracks compensatory mitigation wetlands authorized or required through the state and local permitting process. There may be other tidal wetland creation and restoration projects not accounted for in this review.

For the past 11 years, a cumulative net loss of tidal wetland impacts has been authorized in the Commonwealth (Figure 4, on page 4). If the area of tidal wetland mitigation during this time frame is compared to the cumulative impact area (558 acres), then the overall

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Hooded Merganser (*Lophodytes cucullatus*)

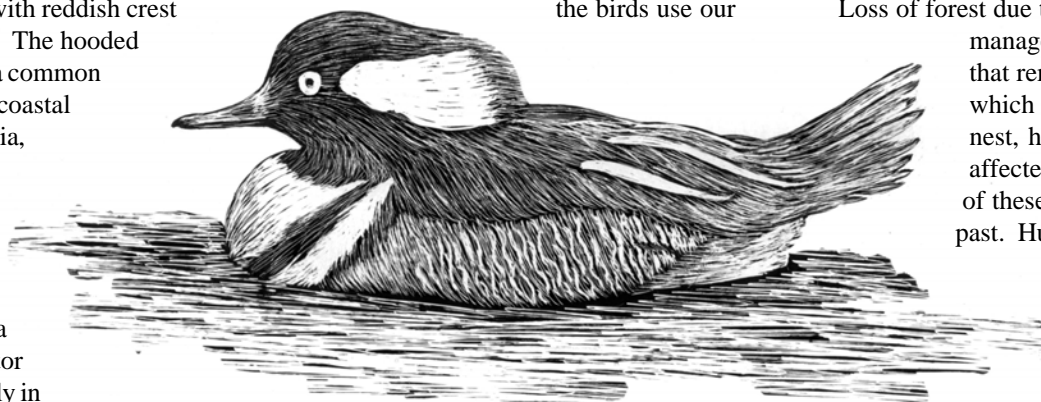
By Julie G. Bradshaw

If there were an award for “most handsome duck,” the male hooded merganser would probably be the winner. His most striking feature is a black-bordered white crest, which can be raised or lowered. The crest in the accompanying illustration is partially raised. Perfectly complementing the crest is the duck’s white chest, flanked by two vertical black bars and rich reddish brown sides. The female hooded merganser is a more discreet grayish brown color with reddish crest and no white. The hooded merganser is a common visitor to the coastal plain of Virginia, particularly in the winter, but you must look carefully to see it, as it is a secretive visitor found primarily in protected, calm, clear ponds, creeks, and estuarine bays. Other ducks with white patches on the head include the ruddy duck, which has a large white patch below the eye and behind the bill. It also has an upturned tail and blue bill in breeding plumage. In winter, the ruddy duck is usually seen in our area in large groups on large water bodies. With the bufflehead, the white on the head is not bordered by black, and the white on the underside extends from the neck to the tail.

The hooded merganser dives from the water surface after its prey of small fish and crustaceans such as crayfish. It also takes aquatic insects and some plant material. It prefers relatively clear water through which it can see its prey. Land-disturbing activities that result in

muddy water are detrimental to the species. As with other mergansers, the hooded’s bill is long, horizontally flattened, and serrated for catching and holding fish, giving them one of their common names, sawbill.

Hooded mergansers are generally seen in pairs or very small flocks. They begin pairing in November or December while in wintering areas. Some breeding occurs in Virginia, but it is very localized, and the birds use our



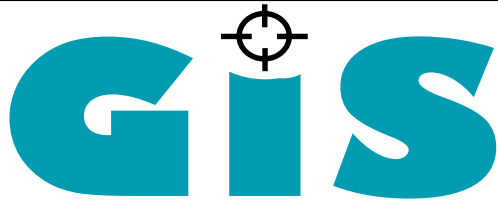
waters primarily for wintering. Hooded mergansers breed more commonly in Canada and south through the central United States in the Mississippi flyway states. They arrive in breeding areas early, often before ice has left the water bodies. Breeding is restricted to freshwater areas surrounded by deciduous forest. Hooded mergansers nest in tree cavities near water. They compete with other hooded mergansers and with other duck species (such as wood ducks) for nesting cavities. Once a cavity is claimed, the hooded merganser begins laying eggs, usually 10-12 per nest, in March to early-June. It generally doesn’t add nest material except for some of its own down feath-

ers once all the eggs are laid. The eggs are unusual in that they are almost spherical, are usually bright white, and have a relatively hard shell. The male abandons the female once she begins incubating the eggs. Incubation takes approximately one month. Once hatched, the young spend only 24 hours in the nest, and then follow their mother into the pond or stream near their nest tree. They can fly at approximately 2 ½ months of age.

Loss of forest due to logging and management practices that remove snags, in which the ducks could nest, has adversely affected the population of these ducks in the past. Hunting previously claimed a larger percentage of this species, but the hooded merganser is not currently a particularly favored target, in part because of its strong taste. Populations are now thought to be stable or even increasing.

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Geographic Information System

Workshop for Coastal Managers Planned for May 19-20, 2004

Marcia Berman

This May the Comprehensive Coastal Inventory Program (CCI) will host a two-day workshop to train coastal managers to use the numerous online tools developed by the program. Over the last several years, the program has expanded its online data resources and generated tools, both static and interactive, in support of coastal management. These are largely decision support products to enable managers to enhance their decision making capacity by bringing data to their desktop. Heavily based on GIS technology, these tools bring together the most recent digital data products available. Interfaces have been developed to enable easy access to data, maps, and query systems for GIS and non-GIS users.

Collectively referred to as The Coastal Manager's Tool Box, it is an

assemblage of products developed by CCI and accessible through the internet. Tools for evaluating shoreline condition, riparian land use, and sensitive environmental resources are available. Throughout the workshop, participants will be trained in using these tools through a series of hands-on exercises. Brief presentations will provide background information on each tool. Participants will then proceed through a series of exercises at a workstation. The exercises will simulate problem solving issues coastal managers must address in their everyday roles. The types of tools included in this toolbox will assist with shoreline management, permit evaluation, decisions regarding wetlands mitigation or restoration, and shoreline development. For a preview of the types of tools to be demonstrated at the work-

shop you can visit these websites: <http://ccrm.vims.edu/gis/gisdata.html>, <http://ccrm.vims.edu/output/virginia/introduction.htm>, <http://ccrm.vims.edu/marinasiting.htm>, http://ccrm.vims.edu/cci/wet_target/.

Who should attend? This workshop is primarily aimed at coastal managers at the local and regional levels. State resource managers are also encouraged to attend. Participation will be by invitation. However, several slots will be reserved for those outside our mailing list. If you are interested in attending please contact Marcia Berman at (804) 684-7188 or marcia@vims.edu. Details regarding registration will be provided later. The workshop will be held at the College of William and Mary in Williamsburg, Virginia.

Permitted Tidal Wetland Impacts *continued from page 2*

net loss of tidal wetlands appears to be significant. If only the cumulative fill area is considered, then this deficit is reduced. During the period 1993-2003, the cumulative fill or loss of tidal wetlands was approximately 125.7 acres. During the same time period, 20.0 acres of compensatory mitigation was required resulting in a net permitted loss of 105.7 acres of tidal wetlands.

To run your own queries using the tidal wetlands database on a locality or watershed basis, visit the Virginia Tidal Wetlands Impacts web site: <http://www.vims.edu/rmap/wetlands/cgi-bin/index.htm>

Maintenance of this database would not be possible without funding from the Virginia Coastal Resources Management Program (NOAA) and the

efforts of VIMS personnel from both the Wetlands Program and the Comprehensive Coastal Inventory at the Center for Coastal Resources Management.

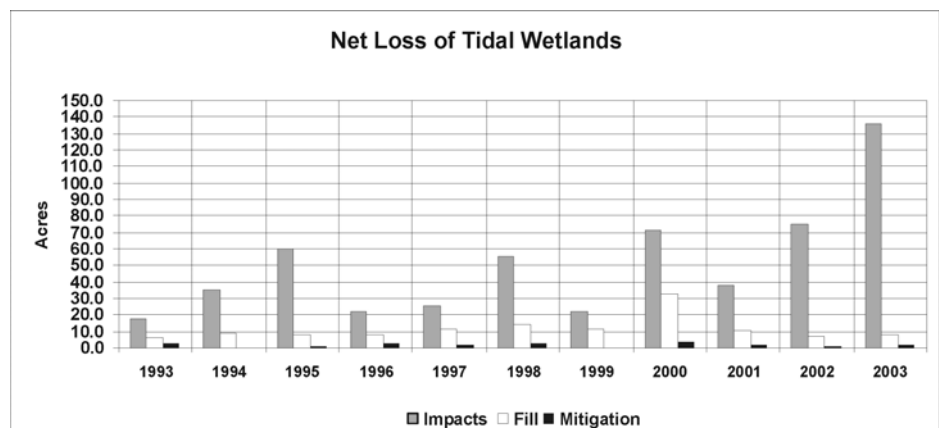


Figure 4. Net loss of tidal wetlands permitted annually in Virginia.



Varied & Versatile Wetlands

Alligators Abound! Alligator Farming in America

Pam Mason

How would you like to trade your common backyard oyster growing for something a bit more exciting? Alligator farming is now a modern day aquaculture practice. Not at all what you would expect from aquaculture, lacking expansive open ponds, floats or cages; raising the wetlands denizens appears at first blush more like chicken farming. In fact, several alligator operations have been born of a necessity to dispose of poultry waste while producing a marketable product. The meat is served in restaurants and sold in southern and specialty markets and the skins are popular in Europe and Asia for wallets, handbags and other accessories.

The native range of the American alligator (*Alligator mississippiensis*) is freshwater and brackish wetlands of the coastal plain from North Carolina to Mexico. Adult alligators are the top predators in these marshes, while the eggs and hatchlings are forage for small rodents, raptors, other reptiles, and notably, larger alligators. The alligators play an important ecological role in the Everglades by creating depressions that serve as ponds during the dry season providing habitat for aquatic species and drinking water for mammals and birds. This service does come at a cost, however, as the alligators are guaranteed a front row at the buffet. The mystique and cache of the alligator also plays an important role in the preservation of wetlands through the tourism industry.

In Louisiana, swamp tours which are orchestrated around alligator sightings generated almost 2 million dollars in 1998 (Roberts, 2001)

Alligators, along with the other members of the order Crocodylia, have



Louisiana farm hatchling.

been hunted for their hides to the point of near extinction. Over-harvest of the alligator, along with habitat loss, depleted the population to extreme lows by the 1950's. Alligators were listed as endangered or threatened under the 1973 Endangered Species Act. Additional protection came from the US participation in the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITIES) which listed all members of the order Crocodylia as in need of protection (Masser, 1993).

A hunting ban promoted the recovery of the wild alligator population. The rebounding wild populations prompted a change in the CITIES listing to "threatened for reasons of similarity of appearance." This classification means

the alligator is not endangered in its native range, but products must be closely regulated to protect other endangered crocodylians from risk of being taken and marketed as American alligator. The new classification allows for the farming and sale of alligator products.

Interest in alligator farming took hold during the 1980's when advances in environmentally controlled production improved survival and allowed for the growth of a four foot alligator in under two years. Current production is concentrated in Louisiana, Georgia and Florida. There are somewhere around 60 farms in Louisiana and another 60 in Florida. The market value of farmed Florida alligator for 2002 was

around 3 million dollars (Florida Fish and Wildlife Conservation Commission, 2002), while Louisiana was over 24 million dollars. (Louisiana Fur and Alligator Advisory Council, 2002)

The alligator industry is touted as a sustainable use industry. Some of the proceeds from the industry go toward preserving habitat, promoting captive breeding and population management. Additional gains in the wild populations come from the release of the farm raised animals where the natural survival rate is only 10-20%. In Louisiana, 14 percent of the farm reared animals must be returned to the wild (The Lafayette Daily Advertiser, 2004). It would appear that these captive releases and other efforts are critical

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Tidal Wetland Mitigation Banking Coming to Virginia Waters

By Tom Barnard

Graphics by Walter Priest and Tamia Rudnicki

Wetland mitigation banking involves the provision of “offsite” wetland compensation through the restoration or creation, usually by a third party (not the applicant or the regulator), of a pre-approved wetland area which serves as compensation for permitted wetland losses. Many small permitted losses are thus offset through the purchase of wetland credits that have been “banked” by the third party. Theoretically, the compensation wetlands are established prior to their being debited from the bank and the “banker” has a financial incentive to see that the compensation wetlands are successfully established and maintained. Additionally, the potential income to be generated through the sale of credits precipitates development capital that would not be available for the establishment of small compensation areas, were they to be developed singly. Wetland banks usually involve the restoration or creation of wetlands, although on rare occasions the preservation or enhancement of existing wetlands may be added into the credit mix. The latter two activities are generally seen less frequently since they do not contribute to the “no net loss of wetlands” goal that undergirds and has stimulated the banking effort to date (Hershner 1997).

Nationally, wetlands mitigation banking probably began around 1980 and has increased significantly both in terms of the number of banks and the total acreage involved. The Environmental Law Institute (ELI) has documented this growth in two separate studies (ELI 1993 and ELI 2002). According to the reports, there were 46 approved, active banks in 1992 and this number had increased 376% to 219 by 2001.

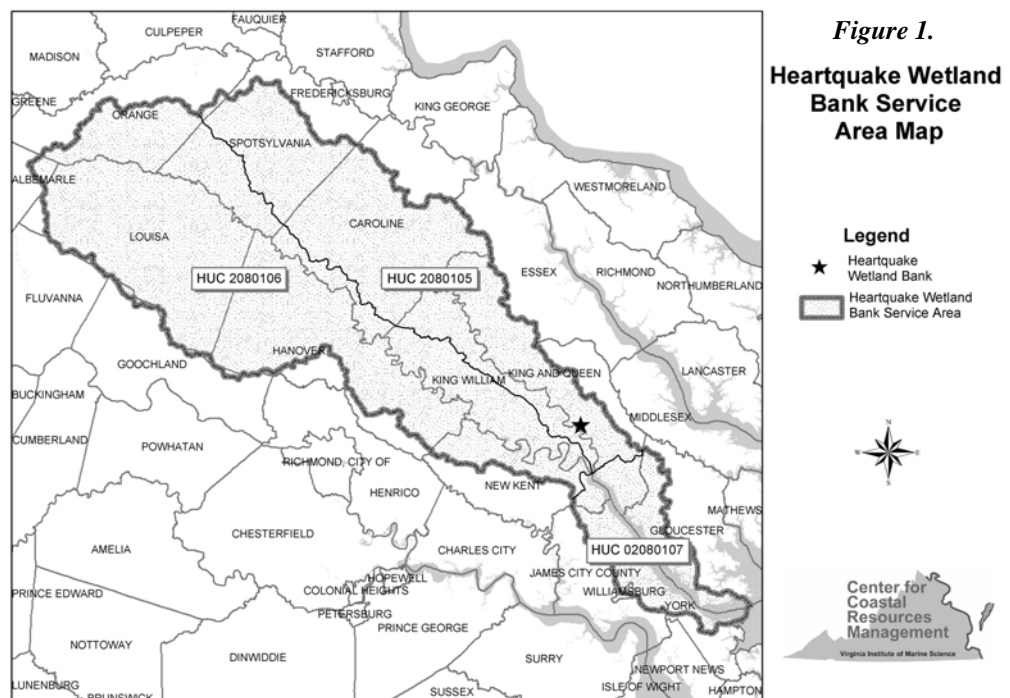
Of the 219 banks, 22 are reported to be sold out. The wetlands acreage involved with the approved banks was 17,664 and 139,000 in 1992 and 2001, respectively. Wetland banks are now found in 40 states with the majority being located in the southeast (104,000 acres) and the fewest in the northeast (20 acres). Florida alone boasts 34 banks with a total of just over 50,000 bank acres approved. The ELI studies point out another highly significant change that has taken place with wetland banking over the last ten years. In 1992 there was only one private commercial bank in the U.S. Virtually all of the approved banks at that time were owned by state highway departments, port authorities and local governments. Ten years later, there were 131 commercial or entrepreneurial banks (62%).

The ELI studies attempted to document to what degree banks were mitigating for coastal and tidal marshes but due to limited bank descriptions were not able to identify all banked wetland vegetation types. They did conclude

that tidal wetlands are under-represented given the 5.3 million acres found in the U.S. ELI identified 14 out of the total 139 banks (10%) as having saltwater marshes or tidal wetlands.

According to the Environmental Protection Agency and the Corps of Engineers, there are presently 59 proposed or operational banks in Virginia. Three banks have sold out and none have defaulted. Costs per credit are determined by each bank and are based primarily on supply and demand. Costs per acre vary from 16-20 thousand dollars in the Chowan Basin to 100-140 thousand dollars in Northern Virginia. These prices are for non-tidal banks only (Steve Martin, Pers. Comm).

The Virginia Institute of Marine Science has been reporting the annual tidal wetland losses in Virginia since 1988 and it has become of increasing concern that no attempt is being made to mitigate many of these impacts. These historic tidal wetlands losses are summarized and the losses for 2003 are documented in this newsletter’s com-



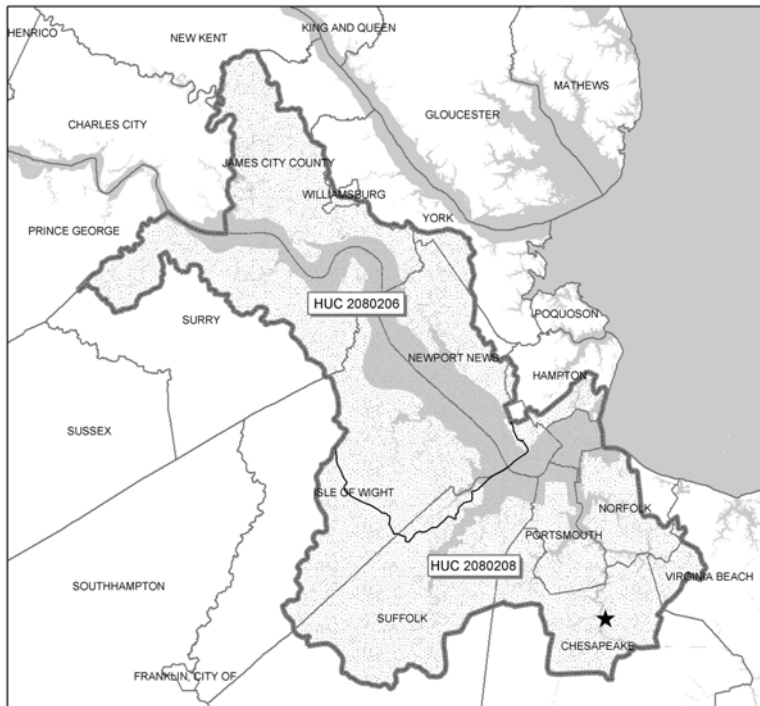


Figure 2.
Libertyville Bank
Service Area Map



At present the parcel is 1.73 acres of non-tidal *Phragmites* marsh and 5.8 acres of upland, of which 3.15 acres was previously used for the disposal of old tires and auto parts. This area and the *Phragmites* will be graded down and planted with salt marsh cordgrass. The remainder of the parcel will serve as a wooded buffer. Available credits within the bank will be based on meeting established performance criteria and a combination of functional assessment and minimum areal ratios. The location and proposed service area of the bank are shown in Figure 2.

With the successful establishment of these first two commercial banks, a number of questions will still remain to be answered. Will tidal commercial

panion article, written by Karen Duhring. Depending on the economics and other factors, tidal wetlands banks, if available, may be one way to offset some of the losses occurring in Virginia. At present however, the only tidal wetland bank in existence in Virginia is the Goose Creek Bank which is a single entity bank belonging to the Virginia Department of Transportation (VDOT) (Barnard et al. 1997). Since it is a single entity bank, it is only available as mitigation for certain types of wetland losses within VDOT projects.

Things could be changing however, with regard to how and where tidal wetland losses are mitigated as well as how the goal of “no net loss” is addressed. With the pending appearance of two commercial tidal banks in Virginia, one that has already been approved and one close to approval, some wetlands boards and the Virginia Marine Resources Commission (VMRC) will have an option available to them which heretofore was only available in dealing with non-tidal wetlands.

The first of these two banks, the Heartquake Wetland Bank, is located in the Mattaponi watershed on Heartquake Creek in King and Queen County. The bank site is a portion of a 725 acre farm owned by the sponsor. The bank has been approved by its Mitigation Banking Review Team

(MBRT) and will create 21 acres of tidal wetlands on site. The bank site is presently composed of agricultural fields and recently timbered woodlands. In addition to the 21 acre bank site, the larger property consists of approximately 215 acres of tidal marsh, 40 acres of non-tidal wetlands and the remainder in cultivation or forest management. The wetland will be developed as a tidal, freshwater mixed marsh (Type 11) and the available credits will be based on established performance criteria and the Function Specific Credit Calculation Method set out in the *Guidelines for the Establishment, Use and Operation of Tidal Wetlands Banks in Virginia*. The Service Area for the bank is comprised of the watersheds within which bank credits can be used to mitigate unavoidable wetland losses, and is shown in Figure 1.

The second of the proposed tidal banks is under review by its review team (MBRT) but appears close to approval. The Chesapeake Land Development Tidal Wetlands Mitigation Bank (aka Libertyville) is located on Mains Creek in the Southern Branch of the Elizabeth River watershed in the City of Chesapeake. The entire site is approximately 7.5 acres and the owner plans the restoration or creation of at least 4.88 acres of salt marsh cordgrass, *Spartina alterniflora* (Type 1) marsh.

banks become as numerous and successful as their non-tidal counterparts have? Will the economics be such that commercial banks can play a role in compensating for the small cumulative wetland losses along residential waterfront, which account for the vast majority of tidal wetland losses in Virginia? Even if it turns out that commercial tidal banks can only be used to offset the unavoidable impacts of other commercial waterfront development, it would appear to be a significant step forward in addressing the continuing wetland losses within Virginia’s bays and estuaries.

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Calendar of Upcoming Events

March 25-27, 2004	Atlantic Estuarine Research Society. Salisbury University. MD. Contact: Frank Parker, frank@vims.edu
May 3-7, 2004	Environmental Monitoring and Assessment Program (EMAP) Symposium. Newport, R.I. Contact: Brian Melzian melzian.brian@epa.gov
May 15-19, 2004	Spring Specialty Conference. GIS and Water Resources III. Nashville, TN. Contact: http://www.awra.org
May 25-26, 2004	Advanced Soils Class. VIMS' Center for Coastal Resources Education, Gloucester Pt., VA For additional information, contact: Dawn Fleming at (804) 684-7380 or dawnf@vims.edu
June 28-30, 2004	Riparian Ecosystems and Buffers: Multi-scale Structure, Function and Management. Olympic Valley, CA. Contact: http://www.awra.org/meetings/olympic2004/summer2004.doc
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
July 25-30, 2004	INTECOL International Wetlands Conference. Utrecht, The Netherlands. Contact: www.bio.uu.nl/intecol
July 28-30, 2004	Wetland Plant ID/Collection Class. VIMS' Center for Coastal Resources Education, Gloucester Pt., VA. 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
August 10-12, 2004	Wetland Plant ID/Collection Class. VIMS' Center for Coastal Resources Education, Gloucester Pt., VA. Contact: Dawn Fleming at (804) 684-7380 or dawnf@vims.edu
August 24-26, 2004	Wetland Plant ID/Collection Class. VIMS' Center for Coastal Resources Education, Gloucester Pt., VA. Contact: Dawn Fleming at (804) 684-7380 or dawnf@vims.edu
September 12-15, 2004	2nd National Conference on Coastal and Estuarine Habitat Restoration. Seattle, Washington. Call: (703) 524-0248.

Alligators Abound! *continued from page 5*

given that without a successful captive breeding program, producers must rely on the wild harvest of eggs. The need to ensure a supply of wild eggs may actually create an incentive to preserve the wetland habitats of the alligator.

The on-going debate as to whether farming an otherwise illegal product promotes or discourages illegal wild harvest has yet to be answered for the long term, but for now, alligator farming and population recovery has virtually eliminated the market for illegal hides. Indeed, the burgeoning populations

have been re-opened for limited controlled hunting and wild harvest products are available to the market. The recovery of the wild populations and de-listing from the Endangered Species Act has been attributed, in part, to alligator farming.

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