8. Newport Bay

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CONCLUSIONS

The ecosystem health of Newport Bay is impacted

Newport Bay ranked third of the Coastal Bays for estuarine health and second for watershed health. Intact natural shorelines, high wetland coverage, and low impervious surfaces were balanced by degraded water quality, low densities of hard clams, and poor seagrass coverage. This resulted in Newport Bay’s overall ecosystem health ranking as third in the Coastal Bays. For more information, see Chapter 2—Ecosystem Health Assessment.

NEWPORT BAY ISSUES

Although the following issues are presented here as pertaining to Newport Bay, they also apply to other Coastal Bays subwatersheds.

Stormwater management & retrofits were investigated in Berlin

The Town of Berlin has experienced flooding in the Bottle Branch and Kitts Branch subwatersheds for years. Flooded streets and neighborhoods are a common occurrence during even small rain events. Past studies have determined that flooding is the result of inadequate storm drain
Newport Bay & watershed facts

- Watershed area (km²) 113
- Average bay depth (m) 1.22
- Surface area of bay (km²) 15.9
- Watershed area : surface area 7.1
- Bay water volume (m³ × 10⁶) 19.4
- Watershed area : water volume 5.82
- Flushing rate (days) unknown
- Population 17,711

Land use in Newport Bay subwatershed

- Wetlands 11.9%
- Agriculture 35.0%
- Forest 42.4%
- Residential 6.9%
- Beaches & bare ground <1%
- Commercial/urban 3.4%

Conceptual diagram depicting general land use and features of Newport Bay and its watershed.

systems and debris jams in culverts and ditches. The Town and the U.S. Army Corps of Engineers have completed a comprehensive investigation into these problems, inventorying storm water basins and making recommendations to alleviate the flooding issues.²⁶

The three-phase investigation sought to:
- Compile and review existing stormwater management plans of all of the subdivisions, topographic mapping, aerial mapping, previous studies, etc.
- Conduct a field survey of the stormwater collection and drainage system within the Bottle Branch and Kitts Branch subwatersheds in order to develop complete connectivity of drainage. The location and condition of stormwater structures such as inlets, ponds, and drainage ditches will be confirmed.
The U.S. Army Corps of Engineers and the Town of Berlin have assessed the condition of stormwater structures in Berlin.

- Use various models and calculations to simulate the stormwater system’s behavior under varying rainfall frequencies to define the problems within the system. Both the existing conditions and future conditions will be modeled.
- Identify and prioritize problem areas based on the results of the modeling (and validated by actual flood occurrences).
- Identify system-wide concept plans that would improve flow conditions and reduce or eliminate the flooding problems. Concept-level cost estimates would be developed for decision-making and budgeting purposes.

To date, more than 6 km (3.8 mi) of open drainage ditches have been identified as being in poor condition. Similarly, there are 130 storm structures (grates, pipes, and outfalls) that are rated as poor, as well as seven stormwater ponds that are performing poorly.

The 2007 U.S. Army Corps of Engineers study estimates that a range of $1.43–$1.90
million may be needed to remediate high- and medium-priority areas throughout Berlin.

The key to solving the water quality problems associated with the town’s stormwater will not be to direct the water as rapidly as possible to the bays, but to hold it and clean it with buffers in a location and manner that does not induce flooding.

**Research recommendation**

- Support the creation of digitized land use maps to the level of driveways and sidewalks and buffers.

**Low-impact development will improve the environment of the Coastal Bays**

Low-impact development is the practice of using techniques in building and construction that minimize stormwater runoff and the effect that development will have on the quality of the surrounding environment. For more information, see Chapter 3—*Management of the Coastal Bays & Watershed*.

Policy recommendations from Model Development Principles for Worcester County, a.k.a. Builders for the Bay Roundtable included:

- Assist Worcester County in implementing the recommended Model Development Principles for the county, particularly the creation of a Coastal Bays watershed education and certification program for the development community with the following elements:
  - Include local government officials, developers, environmental groups, and Coastal Builders for the Bay in the committee to design and support this program.
  - Target developers with an education campaign that includes the importance and benefits of better site design techniques, with an emphasis on the economic benefits. ‘How-to’ resources should also be included.
  - Create a certification process through which a constructed development can receive ‘green development’ award/recognition.
  - Include a list of better site design elements and a predetermined certification points system in the education materials.
  - Create two levels of recognition/certification to recognize/reward those developments that include better site design elements and those that go ‘above and beyond.’

The extensive marshes in Newport Bay are rapidly eroding.
Consider participation incentives such as free marketing via newspapers and websites, public recognition, referral system for developers, sign/flag to display at development site, etc.

Verify design elements at time of construction.

Assist Worcester County in implementing the recommended Model Development Principles for Worcester County, particularly the creation of a Coastal Bays watershed landowner/manager education and stewardship program with the following elements:

- Include local government officials, developers, environmental groups, realtors, chambers of commerce, existing educational groups, and the Maryland Coastal Bays Program in the design and support of this program.
- Target the education and stewardship campaign to landowners/managers, including homeowners, homeowners’ associations, commercial landowners, and professional property management companies.
- Develop a certification process for landowners/managers that rewards use of better site design techniques.
- Require new development and encourage existing homeowners’ covenant language to protect stream buffers in perpetuity and provide buffer maintenance requirements. Create adaptable template language that can be used by homeowners’ associations and provide it to them through the program.
- Create adaptable buffer ‘notification’ language that is provided to landowners/managers at the time of sale by homeowners’ associations that outlines the specific landowner’s responsibilities and applicable regulations associated with natural areas on or adjacent to their properties.
• Create/adapt materials targeted to landowners/managers on:
  • Benefits and responsibilities of living in a coastal community.
  • Importance of proper maintenance requirements for stormwater management measures (ponds, vegetated channels, etc.).
  • Specific coastal-friendly behaviors (downspout disconnection, reduction/minimization of impervious surface, preventing buffer encroachment, reforestation, afforestation, etc.).
• New residents of the county should receive a ‘Welcome to Worcester County’ package, which should include many of the above elements. The process to achieve this will need to be determined—perhaps through the realtor industry or chamber of commerce.

**Total Maximum Daily Loads have been established for Newport Bay**

Total Maximum Daily Loads (TMDLs) are the amount of nutrients (or other pollutant) that a given waterbody can receive while still maintaining its health. Many waterbodies receive more than this ideal amount and are impacted by the additional load. The idea is to calculate how much pollution a river or bay can accommodate in an average day, and work to reduce the amount of pollution discharged (from both point and non-point sources) to that amount. For example, if a river can accommodate 45 kg (100 lb) per day of a particular pollutant but the factories and other sources in the watershed discharge 90 kg (200 lb) per day, the total discharge must be cut in half. The TMDL does not say which factories will reduce their discharge by what amount, only that the total reduction must be 45 kg (100 lb).

TMDLs were originally developed to clean up discharges from point sources,
such as factories and wastewater treatment plants. However, in the Coastal Bays, most pollutants come from non-point sources. Non-point sources include septic tanks, farm fields, lawns, cars, and a host of other sources of nutrients and chemicals. The principle remains the same—determine an acceptable daily load, and work to reduce the load to that amount. Non-point sources, though, present a much greater challenge.

There are many sources of nutrients in the Coastal Bays watershed, and everyone contributes to a degree. Determining each person’s responsibility, or which sources or activities provide the cheapest and easiest means to reduce the total, has proven elusive. The TMDLs for the Coastal Bays are guideposts—milestones on the path to clean and healthy bays. The will to find solutions and reduce pollution must still come from the people of the watershed. TMDLs have also been established in St. Martin River, Isle of Wight Bay, and Chincoteague Bay. For more information, see Chapter 3—Management of the Coastal Bays & Watershed.

**Recommendations**

- Implement Worcester County’s Comprehensive Plan.\(^{11}\)
- Review wastewater treatment plant permits as the plants expand or modify, to examine other options to reduce nutrient loads coming out of those point sources.
- Develop water quality and hydrodynamic models to distinguish between the impacts of various alternatives.
- Determine the impact of winter point source discharges.
- Effective land application of wastewater is the most desirable (e.g., spray irrigation of agriculture).
- Minimize the total load to the ecosystem.
- List the major loads into Newport Bay, and then look for nutrient reductions at every possible opportunity. The largest sources should be addressed first for the most impact.
- Address issues with wastewater treatment plants in the permitting stage, as opportunities to review the sites will not occur for several years after the permit is given.

**Nuisance waterfowl species threaten the bays**

Since early colonization of North America, new species have been introduced at an ever-increasing rate. These species have arrived through a variety of pathways, including through the ballast of ships (e.g., zebra mussel), in the wooden packing material of imported goods (e.g., Asian long-horned beetle), and through deliberate import for various uses (e.g., green crab). While most of these introduced species are benign, about 15% become invasive.

An invasive species shows a tremendous capacity for reproduction and distribution throughout its new home, and also has a negative impact on environmental, economic, or public welfare priorities. Many introduced species do not show a propensity to

Resident Canada geese are found throughout the Coastal Bays year-round.
become invasive for several generations, so species that were once thought to be beneficial, such as grass carp, European starlings, mute swans, and nutria, have demonstrated the characteristics of invasiveness long after their original introduction. These and other species are proving difficult to control in their competition against native species for food, shelter, water, or other resources, and their impacts on economic interests and human welfare. Without the disease and predators that they contend with in their native habitats, the spread of these species can be rapid and the efforts to control them can reach billions of dollars.

When ecologists talk about the impact of introduced species on native species and habitats, they mean that the introduced species is reproducing and distributing itself so efficiently that it is out-competing native species’ use of the same habitats. Even native species can become nuisance species when their populations increase due to human-induced changed to their environment, e.g., increased availability of food. Nature is a very delicate balance, much altered by humans, and the protection of remaining natural interactions between native species and their habitats are the responsibility of local, state, and federal agencies, as well as all citizens.

Two species of nuisance waterfowl—mute swan (*Cygnus olor*) and resident Canada goose (*Branta canadensis*)—are widely distributed in Maryland waters. Throughout Maryland, mute swans peaked in 2003 at approximately 3,600 birds and resident Canada geese numbered around 75,000 birds in 2004. Mute swans eat seagrasses, which compromises this valuable habitat and reduces the amount of food available for native migratory waterfowl. They also aggressively defend their nests, often displacing native waterfowl from their breeding areas. The normally migratory Canada goose has established large year-round resident populations in the Coastal Bays and neighboring Chesapeake Bay. Like
the mute swan, these resident Canada geese impact food and habitat for native migratory species.

Conflicts between humans and these two invasive species include: damage to agriculture, parks, golf courses, and residential properties; bird strikes with airplanes and automobiles; and potential disease transmission.

Snow goose (*Chen caerulescens*) is another native species which has become a problem in some areas. A large and increasing population of snow geese overwinter in the Coastal Bays, and have caused significant damage to marsh—their primary food source—in northern Newport Bay and Chincoteague Bay, lowering marsh elevation, increasing erosion, and enlarging open water areas.¹,³

Management of mute swans, resident Canada geese, and snow geese complements other efforts to protect and restore wild habitats and is a necessary part of any comprehensive restoration effort.

**Recommendations**

- Continue public outreach to recognize mute swan, resident Canada goose, and snow goose population impacts to the environment and humans.
- Continue resident Canada goose population management (egg addling, removal of adults, habitat modification, resident Canada goose hunting) to protect property and agricultural crops, minimize human safety issues, and reduce health concerns.
- Manage mute swan, resident Canada goose, and snow goose populations at sustainable and appropriate levels for environmental and sociological conditions to minimize impact to native wildlife and habitat.
- Continue to monitor the population and distribution of mute swan, resident Canada goose, and snow goose populations and evaluate the effectiveness of management actions.


FEATURES OF NEWPORT BAY & ITS WATERSHED

Newport Bay has extensive marshes & minimal shoreline development

Newport Bay, one of the smallest of the Coastal Bays, sports wide and productive marshes on both banks. The bay’s many tributaries come together in a vast complex of wetlands, channels, ponds, and uplands. However, extensive mosquito ditches are also present in these marshes, which compromise natural drainage.

The wide marshes and many tidal channels have largely held back shoreline development, leaving Newport Bay with a large proportion of marsh. The miles of tributaries, stretching far into the surrounding landscape, make the bay vulnerable to pollution. Agricultural runoff, urban runoff, and discharges from towns and factories find their way to Newport Bay. Yet the bay’s marshes have survived, giving Newport Bay excellent prospects for preservation and restoration.

The Newport Bay subwatershed contains a Non-tidal Wetland of Special State Concern—Porter Neck Bog. The primary management goal for this wetland is to protect the freshwater spring and its drainage and maintain the structure and species composition of the seep.7

Maryland Department of the Environment has worked to prioritize wetlands for preservation, restoration, and mitigation in the subwatersheds of the Coastal Bays, including assessing species and resources and identifying areas where the most benefit could be gained.4,5 For more information on wetlands, see Chapter 3—Management of the Coastal Bays & Watershed and Chapter 15—Habitats of the Coastal Bays & Watershed.

Newport Bay has large forested areas

With 42% forested land, Newport Bay has the second-highest proportion of land covered with woodland of any subwatershed of the Coastal Bays. Add to this the watershed’s diverse hardwood forests and lack of loblolly pine monocultures, and the area emerges as one of the most important forest hubs in the Coastal Bays watershed.

While Berlin anchors the watershed’s northern side, the expansive tidal guts, marshes, and forests on Newport Bay’s southern side help it rival Chincoteague Bay in wildlife diversity. Like its southern cousin, its expansive marshes and riparian forest provide critical habitat for birds, reptiles, amphibians, and rare plants. Extensive hardwood forested wetlands on the watershed’s northeastern and southeastern sides make it a particularly appealing target for conservation. About 325 ha (800 acres) of forest (7% of the total forestland) are currently protected in the 11,000-ha (27,400-acre) watershed.
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