

## Protect Water Resources

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For a town with a relatively small land area, Bremen is fortunate to have diverse fresh and coastal water resources, including ponds, streams, wetlands, coves, estuaries, mud flats and deep-water frontage. Water resource conservation is critical in any community, and is especially so in Bremen. Without a municipal water supply, clean and safe groundwater is a basic necessary for drinking and other household needs.

Many residents of Bremen are dependent on water-based economic activity such as lobstering, clamming and marine services. Our lakes, ponds, wetlands and coastal waters provide habit for wildlife and recreational opportunities for all to enjoy. Waterfront property is highly desirable for homes, but the economic value of waterfront property depends on the ecological well-being of the water resources. For all these reasons, it is important that water resource conservation be seriously considered in development and municipal planning.

### Freshwater

There are four freshwater ponds in Bremen. Two, Webber and McCurdy, are contained entirely in town; Biscay and Pemaquid are shared respectively with the neighboring towns of Damariscotta and Bristol, Waldoboro and Nobleboro. All but Webber are in the Pemaquid River watershed; Webber Pond drains into Muscongus Bay.



Lakes and ponds are fragile. They are settling basins which over time receive and store harmful pollutants from stormwater and snowmelt. Often the injury is subtle and the damage isn’t noticeable until a lake has already entered a state of decline.<sup>1</sup>

Reports available through Maine Department of Environmental Protection<sup>2</sup> and the Pemaquid Watershed Association<sup>3</sup> representing data over several years, most recently 2006, indicate the water quality in Biscay and Webber Ponds are “average.” McCurdy Pond is “above average” and Pemaquid Pond is slightly “below average.”

All these freshwater bodies have sediment which contains average phosphorous content, and all have moderate oxygen depletion by late summer, which could potentially allow released phosphorous to produce algal blooms, thus negatively impacting aquatic animal species in these lakes and ponds.

## **Coastal Waters**

Bremen has a large coastal waterfront area stretching from Broad Cove south to Greenland Cove and Muscongus Harbor. Several large islands in Bremen's coastal waters have seasonal residential development and other smaller islands and ledges that are important wildlife habitat areas.

Bremen is home to a working waterfront in the form of commercial fishing operations and services, shellfish harvesting, recreational boating services, and ecotourism and education. Commercial fishing and shellfish harvesting are important parts of Bremen's heritage and continue to be important to the local economy. Currently there are six private wharfs that support commercial fishing activities in town, in Medomak, Greenland Cove and Muscongus Harbor. Additionally, there is a town pier in Medomak, a boat launching area in Broad Cove, and access to tidal flats in Greenland Cove. (See also section on "Working Waterfront" in Chapter *Maintaining Rural Character*.)

Due to pollutants in the water clamflats in Medomak and Muscongus Harbors have been closed to shellfish harvesting for many years. More recently, large areas of Broad Cove have been closed.<sup>4</sup>

Bremen's coastal waterfront is also home to many residential properties.

## **Groundwater**

Bremen has no municipal water or sewer systems. With the exception of some lake cottages, all household water comes from private wells, and all homes and business depend on septic systems. Since there are no sand and gravel aquifers in Bremen,<sup>5</sup> all wells are drilled into bedrock and depend on finding water that is stored in fractures in the rock.<sup>6</sup> Any contaminant, especially of chemicals, that reaches the fractures in the bedrock can affect the quality of drinking water throughout a large area. Failing septic systems can also contaminate drinking water supplies. A substantial increase in the use of groundwater can lower the water table and increase saltwater intrusion of wells.

The Comprehensive Plan recommended that the protection of the ground water resources of the Town should be a major.<sup>7</sup>

## **Contaminants**

Freshwater and coastal waters are integrally related to the land areas called a watershed which surround and drain into them. Water runoff from shore properties can upset the ecological

balance by adding pollutants and sediment to a body of water, causing changes in plant growth and effecting aquatic animal species. Runoff of this nature is called nonpoint source pollution (NPS).<sup>8</sup>

Some major causes of contamination are: erosion and sedimentation; gravel roads that contribute to erosion and sedimentation; soil disturbance alongside a lake or stream; and phosphorus that flows from a development site.<sup>9</sup>

High concentration of phosphorus content in bottom sediment can result in an algal bloom thereby upsetting delicately balanced ecosystems. Algal blooms rob the water of oxygen, adversely impacting the aquatic wildlife habitat; an imbalance in pond water animals becomes probable. In 2004 there was a high potential for algal blooms in Biscay Pond, which has the most developed sub-watershed in the Pemaquid River Watershed. A state grant provided funds for a joint project by the Knox-Lincoln Soil and Water Conservation District and PWA to identify erosion sites.<sup>10</sup>

Other dangers to lake quality are the introduction of invasive plants and fish.

Groundwater sources of contamination include: failed septic systems; poorly maintained or improperly sited roadways; imprudent and irresponsible use of lawn chemicals; along with the improper disposal of toxic chemicals (paint products and fuels). These chemicals will eventually enter the aquifer. In the survey done for the Bremen Comprehensive Plan, 78% of the respondents wanted to protect ground-water quality. The Comprehensive Plan recommended “The protection of the ground water resources of the Town should be the highest priority of the Town.”

Bacteria from failing septic systems and overboard discharge systems can pollute coastal waters and lead to shellfish bed closures.

## **Conservation**

Coastal and lake properties must be developed conservatively to avoid environmental problems. There are state regulations that govern development activities in these sensitive areas, such as Shoreland Zoning restrictions, Natural Resource Protection Act requirements, and the Uniform Plumbing Code. Bremen has taken actions to protect its water resources by increasing lot size, shore frontage and set-back distance for future development.

In addition to their value as fish and wildlife habitats, marshes act as a filtration system, preventing harmful pollutants and excess sediment from washing into, and possibly contaminating, water sources.

Forests play a major role in protecting water resources. Rain tumbles through tree canopies, understory trees, shrubs and other plants before being absorbed by the “litter” of the forest floor.<sup>11</sup> Underlying forest layers can store large quantities of water, water that eventually is available for wells. Thanks to forests, water is absorbed into the soil instead of running off

and causing erosion. Forests provide vegetative buffers, mitigating some of the harmful effects of inevitable water runoff.

When impervious surfaces such as roofs, driveways, parking lots and roads replace trees and shrubs, rain and snowmelt aren't absorbed but run over the land, carrying with them soil particles and other pollutants. This reduces the storage of water for wells and affects the quality of water in ponds, streams, and coastal wetlands, especially increasing phosphorus levels.

The Comprehensive Plan of 2004<sup>12</sup> discusses in great detail the quality of Bremen's ponds and wetlands and its marine resources and makes many good recommendations for their protection. Conservation of Bremen's water resources is vital to its economy and ecology. Protecting the town's water resources must be a part of all planning and development activities.

### Objectives:

- Maintain forest cover around all water bodies and critical upland watershed areas
- Conserve ground water supplies
- Protect and potentially expand access for working waterfront and recreation
- Maintain high water quality by preventing pollution
- Practice stewardship

1. Maggie Shannon, Maine Congress of Lake Associations, testimony on LD 2249, An Act to Protect Lake Water Quality, April 2008
2. Maine Department of Environmental Protection, [www.state.me.us/dep](http://www.state.me.us/dep)
3. Scott Williams, "Water Quality Overview of the Pemaquid Ponds," prepared for the Pemaquid Watershed Association, December 2007
4. Maine Department of Marine Resources, [www.state.me.us/dmr](http://www.state.me.us/dmr)
5. Town of Bremen Comprehensive Plan, 2004, p. 29.
6. "Aquifers in Maine," p. 1, Maine Geological Survey, Department of Conservation, Augusta, ME.
7. Comprehensive Plan, op.cit. p. 42
8. Issue Profile: Maine Nonpoint Source Priority Watersheds Program, Bureau of Land & Water Quality, Maine Department of Environmental Protection, October 15, 1998.
9. Maggie Shannon, testimony, op.cit., p. 2.
10. Biscay Pond Watershed Improvement Project Watershed Survey, NPS Management Program 2005 Annual Report.
11. Barten, Paul K., "Why Forest Provide the Best Protection for Water Resources," SWOAM News, Vol. 32, No. 1 (January 2007), p. 11
12. Comprehensive Plan, op. cit., pp. 46-59, 65-70.