ENVIRONMENTAL
Fact Sheet

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

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WD-DB-16 2011

Why Lake Drawdowns Are Conducted

Lake level drawdowns are conducted at many New Hampshire lakes for a variety of reasons. The purposes may include protection of the shoreline from the erosion effects of high water, control of aquatic weeds near the shore, reducing the adverse effects of winter ice on the shoreline and shorefront structures, providing water storage capacity to mitigate flooding, and regulating flows to optimize hydroelectric power production.

Background
Seasonal lowering of New Hampshire lakes is a practice that serves several complementary purposes. The origin and benefits of the practice relate to the seasonal changes in our climate and hydrology. The origin of the practice was in the earliest days of settlement when the water stored in lakes was released to power mills downstream. The current benefits also relate to seasonal changes in flow. Starting in the late fall and ending in June, the rate of runoff from storms is greatly increased. The peak runoff in the spring from snowmelt and rain on saturated ground results in high water conditions statewide. If lake levels are low during this period, waterbodies can capture these spring flows and reduce the effect of flooding and damage to shorelines.

Protection of the Shoreline
Shoreline erosion is a natural continuous process. The force of water and soil saturation gradually washes land area into the lake.

High water conditions in combination with heavy winds cause erosion of the shoreline above the normal water line. Drawdowns lower the water level so that the erosive forces of waves are acting below the normal shoreline. Drawdowns also provide vertical space so that if water levels rise as a result of high runoff, they come up to normal levels rather than above normal levels as would be the case if the waterbody were kept full.

Aquatic Weed Control
Aquatic weeds are commonly found in the shallow water near the shoreline. These weeds can benefit the ecosystem but can also become a nuisance to those swimming or boating near the shore area, especially exotic weeds like milfoil. Drawdowns under certain climate conditions cause a drying and freezing of the sediments that become exposed, causing damage or death to certain aquatic weed species. Some species are unaffected by drawdowns. The effectiveness of drawdowns is dependent upon a deep frost and dewatering of the sediments. These conditions may not occur with heavy snow or mild rainy winters.

Reducing Ice Damage
Lake ice can reach a thickness of two feet or more. The force of massive ice is exerted in three

ways. Under the warming spring sun, as the lake ice expands, it can exert 2,000 or more pounds of force per square inch on anything in its path including docks, walls, and the natural shoreline. Ice berms are evident around the shorelines of many lakes. Should lake levels fluctuate when the ice is frozen onto an object, that object will be moved accordingly up or down. As the near shore areas thaw in the spring, the ice sheet is driven by the wind onto the shore. Drawdowns are effective at transferring the location at which these forces are exerted away from the natural shoreline and structures built there.

Water Storage and Flow Regulation

Drawdowns allow for water levels in lakes to rise and fall without causing flooding of shorefront property. This temporary refilling of the lakes reduces downstream flooding, which results from short duration, high runoff events. The gradual draining of the stored water increases the efficiency of hydroelectric power production by reducing the short bursts of very high flows.

Potential Disadvantages of Drawdown

Negative aspects of drawdowns can be experienced by the aquatic ecosystem. Aquatic vegetation, benthic invertebrates, and amphibians may exhibit changes in species composition and density. Fish and waterfowl populations may be affected by reduced food source or physical space to occupy.

Should there be a very dry spring, water levels may not recover by the summer. The active management of water levels requires greater staff and greater expertise in controlling the flows and water levels.

For more information relative to the design, construction, maintenance and operation of dams, please contact the DES Dam Bureau at (603) 271-3406 or email damsafety@des.nh.gov. General information is available at http://des.nh.gov/organization/divisions/water/dam/index.htm. You may also visit our office at 29 Hazen Drive, Concord, NH.