

DAMS

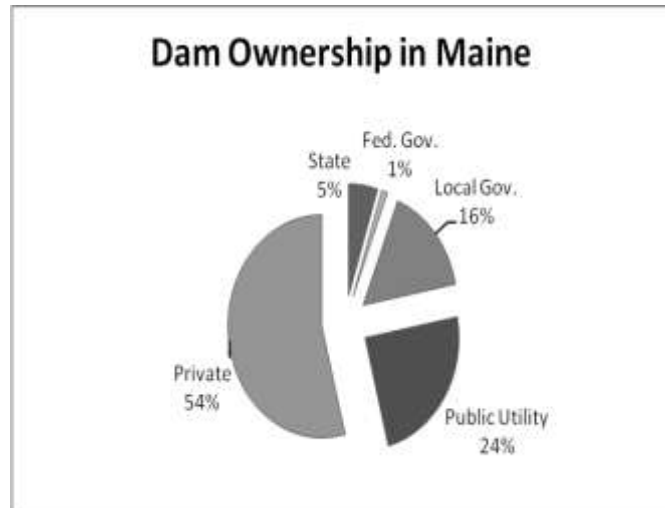
Grade: D+

Overview

Maine has over 1,000 registered dams of which 153 are classified as high- or significant-hazard-potential. Almost half of Maine dams are the responsibility of private owners. Maine spends $\frac{1}{4}$ to $\frac{1}{2}$ of what other Northern New England states spend per dam on inspection. Maine's Dam Safety Program is understaffed and has no enforcement division. Seventeen public high-hazard dams require over \$12 million in repairs.

Introduction and Background

Maine has over 1,000 dams registered with the Maine Emergency Management Agency (MEMA). Maine's dams range in size from small simple structures to larger, relatively modern hydropower (power-generating) dams. The Federal Energy Regulatory Commission (FERC) regulates 131 dams. The New Hampshire Department of Environmental Services regulates 51 dams, which can impact Maine through common watersheds. A total of 250 dams are not regulated or classified due to the specifics of the classification criteria. MEMA regulates 658 dams and can order a dam owner to repair, maintain or operate a dam in a particular manner. These orders result from a safety inspection by MEMA's two State Dam Inspectors (SDIs).



Condition and Adequacy

Maine's dam hazard classification system is based on the nationally accepted United States Army Corps of Engineers hazard classification system. Of the 658 state-regulated dams, 26 are classified as high-hazard-potential dams, 76 are classified as significant-hazard-potential dams and the remaining 556 dams are classified as low-hazard-potential.

In accordance with state law, all high-hazard-potential and significant-hazard-potential dams have to be inspected every two and four years, respectively, to determine their condition. Low-hazard-potential dams do not require condition inspection, but are required to have a verification of their hazard potential completed every six years. The SDIs provide inspection for all state-regulated dams. FERC-regulated dams are inspected by FERC engineers or independent engineers.

Most Maine dams are more than 50 years old and are showing signs of gradual deterioration. Typically, FERC-regulated dams generate revenue for their owners, which can then be used to fund repairs and maintenance. Generally, these dams are in good condition and are safe. However, continual deterioration of most state-regulated dams is a cause for concern. Maine's high-hazard and significant-hazard dams are in fair condition and continue to be monitored. The remaining 500-plus low-hazard dams receive little attention and are in generally poor condition.

There are 73 dams owned by state agencies including Inland Fisheries and Wildlife (IF&W), Department of Conservation (DOC) and the Department of Transportation. Of those, six are significant-hazard-potential dams, four owned by IF&W and two owned by DOC, with the rest being low-hazard-potential dams.

Once a dam is classified as significant-hazard or high-hazard, its owner has to file an Emergency Action Plan (EAP) within six months and update that plan every two years. EAPs are kept on file with MEMA to be used during a dam incident. Additionally, MEMA's Maine Dam Safety Program (MDSP) manages the EAPs for 43 FERC-regulated dams. Most high-hazard-potential and significant-hazard-potential dams regulated by FERC, and nearly 96 percent of state-regulated dams have EAPs. Enforcement actions are underway against owners of the remaining four percent of dams that do not have EAPs. According to state law, each owner that is out of compliance with EAP requirements can be fined.

Some of Maine's challenges related to dam regulation and safety are associated with the inadequate number of personnel for inspection and difficulty in enforcing the inspection findings. Additionally, there is no unified record-keeping system.

Based on the SDI's report, the Commissioner of the Department of Defense, Veterans and Emergency Management, under whose jurisdiction MEMA falls, is empowered by the law to issue an order for lowering the lake of a dam or repairing a dam. Costs associated with the implementation of the order are the responsibility of the dam owner. This can be a serious economic issue for owners of non-revenue producing dams.

An example of the difficulties involved in implementing and enforcing a dam safety order is the case of a privately-owned significant-hazard-potential dam in Bowdoinham in 2007. The order stipulated control of the dam's lake level and a remedial action plan to be prepared. In this case, owners were unable to pay for professional services for the latter and the matter remains unresolved. In another example, in 2006 in Canton, another significant-hazard-potential dam in poor condition threatened homes and roads. Due to the condition of the dam, the order required gates to be removed to lower the lake level, thus impacting shorefront properties. The town at that time, assumed ownership and has installed a temporary sandbag dam to increase shore level back to normal. The temporary dam is considered a low-hazard-potential dam and is not subject to the dam safety order.

Dam integrity assessments can, in some cases, be conservatively performed using physical observations without incurring major expense. On the other hand, regulated dams generally do not have detailed construction records, therefore, making it difficult to assess their structural integrity and safety conditions without comprehensive investigation.

The importance of registration, routine inspection and maintenance is illustrated by recent history. Dam failures are not unprecedented in Maine. For example, two previously unregistered dams failed during floods in April 2008. The first, Meserve Dam, caused \$100,000 in damages while the second, Shorey Brook Dam, caused little damage.

Investment Needs

In Maine, dam safety and liability, as well as the financing for their maintenance, upgrade and repair, is the responsibility of the dam owners. MEMA's MDSP is understaffed, with two full-time SDIs. There was only one full-time inspector until October 2008, when a new position was filled. Furthermore, there is no enforcement division.

The MDSP is funded by the state and federal government. Based on the 2006 budget, which has approximately \$110,000 for the MDSP, Maine ranks among the bottom five states in the nation. The annual MDSP budget is less than similar programs in either New Hampshire or Vermont. Vermont, which has less than half the number of dams as Maine, spent more than twice as much money on dam inspection. New Hampshire, which has more than three times the number of dams as Maine, has a budget almost six times larger for dam inspection. The estimated 2008-2009 budget for the MDSP is approximately \$133,000. Of that, nearly 80 percent is contributed by the state and nearly 20 percent is contributed by the federal government. The present budget does not appear to change the rank of Maine's MDSP compared to those of the previously mentioned New England states.

In 2007, according to the Association of State Dam Safety Officials (ASDSO), Maine has 17 high-hazard dams owned by public entities that require an estimated \$11.9 million in repair costs. Only \$1.78 million in funding was being considered for Maine from the National Dam Safety Program from federal legislation passed by the House of Representatives in October 2007. As of October 2008, the Senate had yet to enact the legislation.

Conclusions and Recommendations

According to ASDSO's *Guidelines for the Model Dam Safety Program*, Maine's current staffing levels for the MDSP are inadequate. Considering the age of the state's existing dams, the demand for comprehensive and intensive safety inspections is on the rise. Even with an additional dam inspector, MDSP personnel will still not be able to provide the necessary level of inspection and enforcement of dam safety orders.

Currently, the inspection system does not provide quantitative evaluation or grading data about dam functionality or the likelihood of a failure. Incorporating such data into the inspection process would improve dam evaluation procedures and help in the development of dam improvement and repair programs.

The state owns approximately five percent of the entire dam inventory in Maine, and does not have a budget for maintenance for most of those dams. In most cases, only limited resources are available for meeting the needs of municipal- and privately-owned dams, as well. Private and municipal dam owners have difficulty completing the repairs and improvements required by the state through dam safety orders. Maine ASCE gives dams a grade of **D+**.

Maine ASCE makes the following recommendations:

- Increase the staff and budget levels to accommodate current and projected inspection needs. Funding must be increased to almost three times the current level to be in line with the budgets of other New England states, and to almost six times the current level to keep up with annual inspections and implementation of dam safety orders, as mandated by state dam safety law;
- Develop a long-term strategic program and plan, including identification of possible funding sources, that address the needs to investigate, repair, upgrade and operate the aging state, municipal and privately owned dams, and increased accountability of dam owners;
- Work with Maine's Congressional delegation to persuade the Senate to enact the Dam Rehabilitation and Repair Act to fund the National Dam Safety Program and address the most critical non-federal public dams; and
- Improve the record keeping system. Unification of data from different agencies will help concentrate dam safety, operation and maintenance under one oversight organization or department.

Sources

- State of Maine law, Title 37-B MRSA c.24 Chapter 24 " Dam Safety"
- NID/State Program Performance Report, July 26, 2008
- Personal communication with Maine's State Dam Inspector (SDI), Oct. 2008
- Maine Dam Safety Program (MDSP) 08/09, DRAFT-2, 10/2/08, by T. Fletcher -Maine's State Dam Inspector (SDI).
- "Dam Safety in Maine" & "Maine Dam Safety Program", Association of State Dam Safety Officials, Spring 2008
- "Cracks in the system", Investigation Report by Maine Sunday Telegram, July 2006
- Executive Summary of A Review of State Dam Abandonment and Registration Laws and Federal Dam Licensing Laws (Joint Standing Committee on Natural Resources to carry over LD 626, An Act to Reinstate the Laws Governing Dam Abandonment, from the First Regular Session of the 117th Legislature to the Second Regular Session)