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## Introduction

Most waterborne pathogens originate from human or animal feces that enter the water supply and are either not killed by treatment or introduced into the distribution system after disinfection has taken place. Wildlife populations are known sources of pathogens in raw water supplies. The consequences of exposure to pathogens in potable water can range from no effect, to mild or severe illness, and even death. HWW’s waterfowl management program is intended to minimize the adverse wildlife impacts on the watershed resources.

Certain wildlife, namely the gulls and geese in Holyoke’s watershed area, can severely impact the water quality and watershed conditions. When wildlife activity has a direct impact on the water quality, control measures are necessary to preserve the natural resource. Roosting gulls and geese can negatively impact the water quality through bacterial contamination. Typically, the feces from the waterfowl will ultimately result in high total and fecal coliform bacteria levels in the water supply source.

Currently, the Tighe-Carmody and McLean Reservoirs are meeting the water quality requirements for non-filtered surface water sources as established in the Surface Water Treatment Rule. However, for three months in 1994, the Ashley Reservoir did not meet the coliform source water quality criteria for non-filtered water. The correspondence between Holyoke Water Works, MADEP, and Tighe & Bond summarizing the coliform concentration problem is included in Appendix A. The high fecal coliform counts at the Ashley Reservoir were likely the result of seagull and other waterfowl defecation. In response to this situation, HWW has implemented its waterfowl management program and the Ashley Reservoir has been taken off-line.

Coliform monitoring is not conducted at the Whiting Street Reservoir since it is an emergency source.

## Waterfowl Management Program Goals

The primary goal of the waterfowl management program is to protect the water quality of the surface source while minimizing the adverse wildlife impacts. Accordingly, the goals of the wildlife management program are to:

1. Mitigate potentially adverse impacts of wildlife on water quality and other watershed resources
2. Maintain the filtration waiver by meeting the fecal coliform source water quality criterion (≤ 20/100 mL in at least 90% of samples) and the total coliform source water quality criterion (≤ 100/100 mL in at least 90% of samples) for non-filtered water. If both fecal and total coliforms are measured, the criterion for fecal coliforms takes precedence.
3. Assess and mitigate impacts of watershed management activities on wildlife through animal surveys

## Program Description

Where the presence of wildlife is determined to be problematic, control and management practices consist of two basic approaches to watershed protection - non-lethal and lethal tactics. Discouraging habitation in the initial stages may prove to be the key management practice. HWW’s goal is to discourage waterfowl from nesting and roosting within the watershed area via persistent methods of discouragement and control. The waterfowl management program is applicable to the Tighe-Carmody, McLean, and Ashley Reservoir watersheds.

### Harassment Program - Non-Lethal Tactic

The waterfowl management program, which began in August 1995, supported a harassment program utilizing non-lethal tactics. The program supported scare tactics using single shell shotguns to discourage waterfowl nesting in the watershed areas. Daily watershed reports describe the approximate number of birds, their roosting locations, and the number of shots fired as part of the non-lethal harassment program. Signs were posted throughout the watershed areas to notify the public that sound devices were being discharged and to warn against feeding the waterfowl.

HWW personnel implemented the scare tactic measures for a one-year period with limited success. Although the waterfowl were initially frightened by the sound devices, the birds soon returned to their roosting sites on the watersheds. The approximate number of waterfowl observed on the watersheds was recorded in the Watershed Patrol reports. Copies of HWW Patrolling Reports are maintained at the HWW office.

Other non-lethal tactics were considered including the installation of moving objects such as scarecrows or plastic flags and live trapping. The installation of moving objects was discounted due to the amount of leisure activity (walking) that occurs on the watershed property. The probability that these moving objects would remain standing was extremely low due to the amount of activity within the watershed. The live trapping required permitting and was impractical on a large scale. In addition, both non-lethal tactics give only temporary results.

### Waterfowl Destruction - Lethal Tactic

Since the scare tactics utilizing sound devices (blank shells) were unsuccessful and waterfowl documentation was maintained for one year, the destruction of waterfowl, using 12-gauge single shell shotguns, was implemented as a last resort. The killing of the gulls is supported under G.L. c.111, 174A entitled "Prevention of defilement of domestic water supply by gulls or terns" included in Appendix B.

The destruction of the waterfowl requires the necessary permits from the Environmental Protection Agency and U.S. Fish and Wildlife Services (50 CFR 21). To obtain the necessary permits, HWW had to document the number of gulls in the watershed and the effectiveness of the scare tactics for one year before permits could be obtained to destroy the birds. HWW received their Depredation Permit from the U.S. Fish and Wildlife Service in February 1996 (Permit Number 810497). HWW began its lethal approach to waterfowl management with the goal of preserving water quality. Presently, waterfowl are destroyed by shotgun shells and retrieved by the HWW personnel via rowboat. Copies of the annual report forms that HWW submits to the U.S. Fish and Wildlife Service (Migratory Bird Permit Office) are kept on file with HWW.

Another option that may be utilized is to destroy the seagull's nests and crush any discovered eggs. Other tactics to control the waterfowl population include spraying the bird's eggs with chemicals and/or shaking the eggs to destroy the unborn birds. HWW has not utilized these options of waterfowl harassment and destruction due to the manpower requirements needed to implement these approaches.

### Animal Surveys

Assessing the gull problem is accomplished through animal surveys. These surveys are included as part of the waterfowl management program. The waterfowl counts assist HWW in determining the success of the waterfowl harassment program. HWW will continue the waterfowl management program in an attempt to minimize the water quality risks associated with waterfowl. Since the inception of the waterfowl management program, HWW has consistently met the fecal coliform source water quality criterion for the Ashley Reservoir. The observed seagull and geese populations have been 0reduced since the implementation of the waterfowl management program.

During animal surveys, the HWW has noticed increased beaver populations and dams on tributaries to the Ashley and Tighe-Carmody Reservoirs. Beavers have constructed a series of dams and houses on Black Brook in the Ashley Reservoir watershed. Beavers have also constructed a series of dams and houses on Tucker Brook and Manhan River in the vicinity of Route 66, on Breakneck Brook in the area of the Westhampton/Southampton town line, and on Blue Meadow Brook. The presence of beaver within the watershed is a threat to the public drinking water supply due to the potential for bacterial and viral contamination. HWW has contacted MADEP as well as the Connecticut Valley Wildlife District for suggestions to eliminate the contamination threat from the beavers. Refer to Appendix C for beaver control correspondence between HWW and Connecticut Valley Wildlife District.

HWW attempts to dismantle the beaver impoundments have not been successful. In cases where the beaver impoundments affect the adjacent roadways, increase the erosion potential, and affect public health, the animals have been terminated with proper disposal of the carcasses. Termination of the beaver occurs only as a last resort and is necessary to prevent erosion and ensure roadway safety. Appendix D includes information on the updated beaver trapping laws, which became effective on July 21, 2000.

## Best Management Practices/Implementation Schedule

HWW has implemented the following BMPs for the waterfowl management program.

1. Routine monitoring and population surveys - The animal surveys in the watershed patrol records will continue to be updated to monitor the effectiveness of the waterfowl management program. These observations represent a major source of useful information on wildlife activity within the watersheds and will greatly enhance future efforts to mitigate potential detrimental wildlife impacts.
2. Waterfowl disturbance and harassment - HWW will continue to destroy the waterfowl (within the permit limit) that may negatively impact the quality of the surface water in the watersheds. HWW’s waterfowl harassment program is multi-faceted with lethal and non-lethal tactics being simultaneously implemented.
3. Gull control at local landfills - HWW has identified local dumps or landfills used by the waterfowl that roost on the reservoirs. A form letter (see Appendix E) has been developed to remind landfill owners/operators to adhere to MADEP Policy # BWP-98-003 (Gull Control at Landfills and Other Solid Waste Management Facilities). This letter is sent annually to landfill owners/operators within a 10-mile radius. A list of active municipal solid waste landfills and active demolition landfills in Massachusetts is also included in Appendix E.
4. Gull control at commercial establishments – HWW has identified local commercial establishments within close proximity of the reservoirs that are susceptible to waterfowl roosting. These commercial establishments include restaurants and fast food businesses that have trash dumpsters that attract seagulls. HWW sends these businesses a letter annually advising owners/managers of the potential threat to HWW’s water supply and requesting their cooperation in preventive waterfowl roosting. The form letter is also transmitted to Holyoke’s Board of Health. See Appendix E for a list of businesses and example letter.

The implementation schedule for the aforementioned activities is summarized as follows:

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| **Action Item** | **Implementation Schedule** |
| Routine monitoring and population surveys | On-going |
| Waterfowl disturbance and harassment | On-going |
| Gull control at local landfills | Form letter is sent annually to landfills within 10-mile radius |
| Gull control at commercial establishments | Form letter is sent annually to commercial establishments susceptible to waterfowl roosting. |
| Communicate with Board of Health | Notify the Board of Health of any dumpster violations as defined in Section 74-93 of the Holyoke Code (copy attached to form letter). |