



Urine Diversion Toilets



STRATEGY SCALE

THREATS ADDRESSED

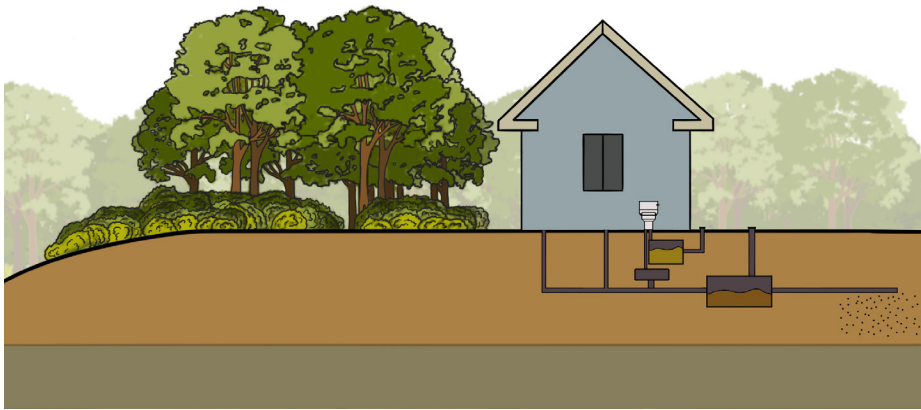
- Excess Nutrients
- Algal Blooms
- Pollutant Inputs
- Erosion
- Invasive/Nuisance Species

STRATEGY GOALS

- Protect
- Manage
- Rehabilitate

STRATEGY CO-BENEFITS

- Habitat (Neutral)
- Aesthetics (Neutral)
- Recreation (Neutral)



- Permittable in Massachusetts**
MassDEP Provisional Approval for General Use under Title 5. Local Board of Health review. List of potential permits available [here](#).
- Implemented on Cape Cod**
See examples of pond projects implemented on Cape Cod [here](#).
- Listed in 208 Plan Technologies Matrix**
Learn more about the nutrient management strategies in the Tech Matrix [here](#).
- Can be Performed at Homeowner Scale**
Local review and permitting may be required.
- Nature-based Solution**

DURATION OF BENEFITS

- Less than one month
- One season or year
- Multiple seasons or years

MAINTENANCE REQUIREMENTS

- Monthly
- Annually
- Infrequent

DESCRIPTION

Urine diversion toilets are an alternative toilet technology to traditional toilets that may prevent nutrients (mainly nitrogen) from entering freshwater ponds from septic effluent via groundwater. Urine diversion is the practice of keeping human urine separate from the rest of the wastewater stream. This is typically done using a urinal or specialized toilet that is connected to a urine storage tank. Urine-diverting flush toilets have a special urine collection basin at the front of the toilet bowl, which catches the urine and drains it to the urine collection tank. The stored urine is periodically collected by a servicing company which empties the tank for disposal or conversion to a fertilizer. When nutrient management in a watershed is desired, onsite disposal strategies may still release varying amounts of nutrients into the watershed, which needs to be evaluated relative to any nutrient limits established to protect natural resources.

ADVANTAGES

- Targets nutrients at the source
- Can enhance nitrogen removal compared to composting toilet designs that combine urine and solids together
- Requires little to no water to flush urine, resulting in substantial water savings
- Improves energy savings, nutrient recovery, and nutrient recycling
- Potential to reduce or eliminate synthetic fertilizer use by utilizing the collected urine which can be used as fertilizer

CONSTRAINTS

- Unclear whether urine diverting toilets can be installed to meet plumbing code
- Requires a significant number of citizens to participate to be effective at scale
- Homeowners may be resistant due to real and perceived operation and maintenance differences relative to conventional toilets
- If urine diversion toilets are widely used, a regional facility for urine disposal and processing into fertilizer would be necessary
- If urine is used as a fertilizer, application at the right time, right amount, and right place is essential to minimize losses to the environment
- Still need conventional septic system for solid waste and graywater treatment
- Requires ongoing maintenance to function correctly



IMPLEMENTATION

POTENTIAL ACTORS

- Towns:** Towns may propose to install urine diversion toilets at town-managed ponds and other town facilities, and provide a supportive role through permitting and education
- Pond Groups:** May propose composting toilets around public or private ponds and provide a supportive role through education
- Private Landowners:** May install composting toilets
- Land Trusts:** Land trusts may provide a supportive role through education

SITING REQUIREMENTS

- All ponds with upgradient development (particularly within 300 feet) using Title 5 or other non-nutrient treating septic systems
- Urine disposal/processing site(s) and licensed urine hauler

INFORMATION NEEDS

- Survey of existing septic systems
- Wastewater flows and groundwater flow direction
- Nutrient sources, travel times, and distances

IMPLEMENTATION EXAMPLES

The Town of Falmouth has investigated the efficacy of “eco-toilets” for the management of nutrient inputs to groundwater. Two types of eco-toilets were investigated: composting toilets and urine-diverting toilets. Project information can be found on the MASSTC website [here](#). In addition, the [Green Center initiated a project in Falmouth](#) to assess how much urine volume could be collected and what amount of nutrients could be diverted from residential wastewater flows using urine diversion.



RESOURCES

- MassDEP maintains a [list of approved Title 5 I/A technologies](#).
- MASSTC has information on phosphorus removal in onsite septic systems [here](#).
- [The Rich Earth Institute](#) has more information on recycling human urine into fertilizer
- The Massachusetts’ Department of Conservation and Recreation’s [Lakes and Ponds Program](#) provides related resources.

COST ESTIMATE

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Varies depending on technology



ADDITIONAL FINANCIAL CONSIDERATIONS

Assessment: Planning, design and permitting

Implementation: Equipment, supplies and installation

Maintenance: Ongoing maintenance required



POTENTIAL FUNDING SOURCES

- Community Preservation Act
- Capital Budget
- Grants
- Private Funding

Additional information regarding potential funding sources is available [here](#).