DELAWARE DEPARTMENT OF
NATURAL RESOURCES AND
ENVIRONMENTAL CONTROL

Urban Forest Buffers

Urban forest buffers are linear wooded areas that adsorb nutrients from groundwater and help filter nutrients, sediment, and other pollutants from surface runoff. The buffers, which are adjacent to waterways in developed areas, help contain high stream flows and provide wildlife habitat. Buffers link terrestrial uplands to stream, river, or wetland ecosystems. Creating or expanding buffers in areas where native vegetation has been removed or degraded can help improve habitat and water quality and provide protection from flooding and erosion.

The width of buffers can vary greatly. A minimum buffer width of 100 feet is generally recommended to minimize impacts to water quality. However, in areas that are already developed, such as along a stream in an urban environment, buffers at least 35 feet wide can still provide important water quality benefits.

Design Considerations

- Ensure vegetation in the buffer consists of native species tolerant of soil type and environmental conditions of the site, including periodic flooding and saturated soils.
- Check for site conditions that may require larger buffer widths, such as:
  - Rare or sensitive habitat types (e.g., vernal pool wetlands).
  - Steep slopes and/or highly erodible soils.
  - Altered hydrology from development on adjacent uplands.
- Select buffers for areas with dispersed surface flow (sheet flow); they may not be suitable for areas with concentrated flow from a pipe or channel, where runoff velocity is too high to allow filtering and absorption.

Benefits

- Improves water quality by filtering pollutants, nutrients, and sediment from surface runoff as the water flows through the buffer zone.
- Reduces damage from flooding by slowing the velocity of floodwaters and providing increased flood storage capacity.
- Stabilizes stream banks and reduces shoreline erosion.
- Moderates water temperatures and oxygen, which protects fish and other aquatic species.
- Enhances wildlife habitat for terrestrial and aquatic species.
- Provides social benefits, including shade, clean air, clean water, community revitalization, community health and well-being, business district enhancement, and general aesthetics.

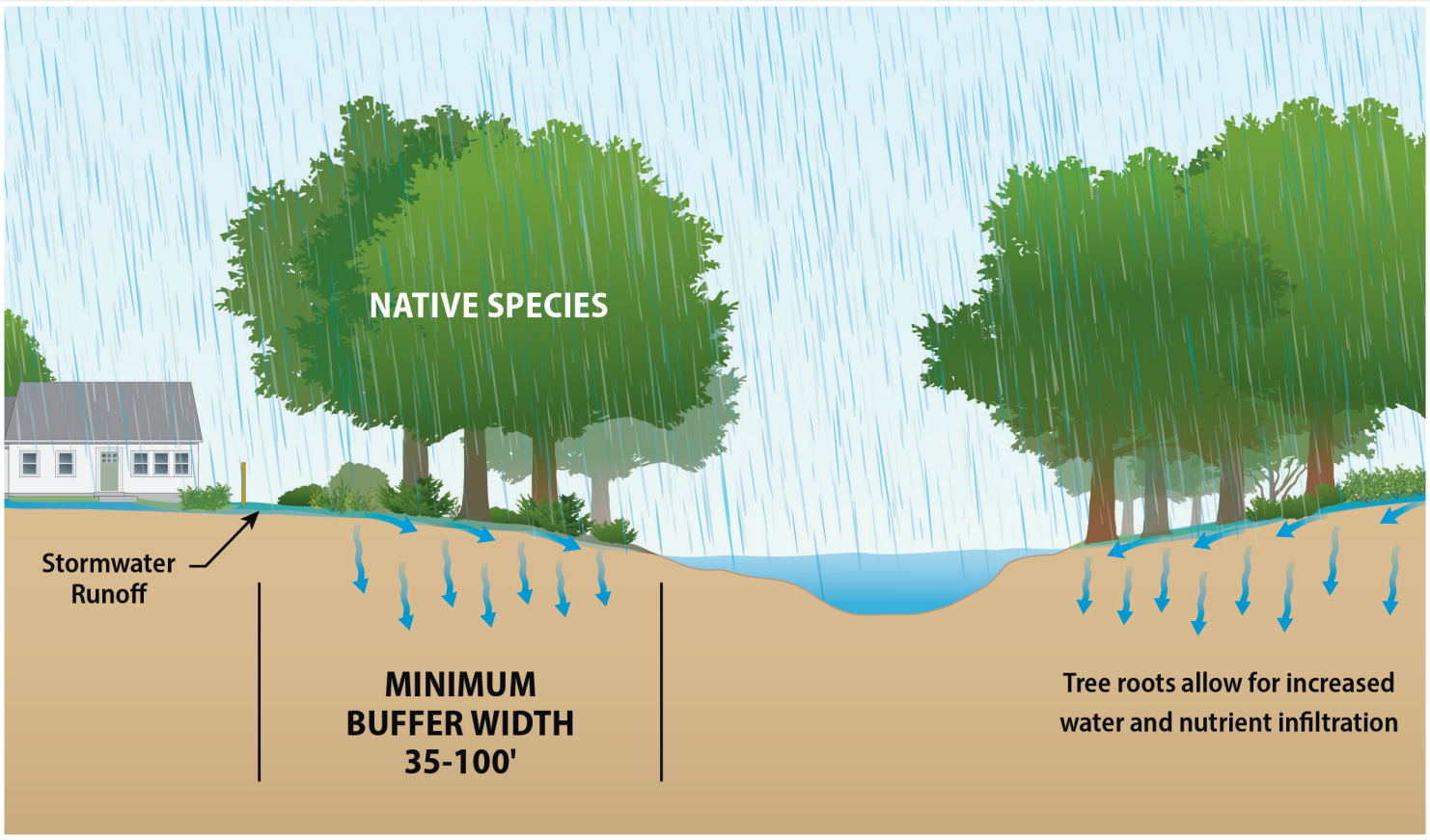
Forest buffer (Source: ©AdobeStock)

Maintenance

- Control weedy or invasive species that may affect native species in the buffer zone.
- Mow, if needed, while avoiding impacts to habitat and wildlife.
- Mow or brushcut paths to the waterway to keep them open.
- Monitor the health and growth of vegetation, checking for insect pests and diseases. Control measures should consider potential environmental, water quality, and wildlife impacts.
- Monitor the vegetation in flood-prone areas after storms and extreme high tides. Restoring or replanting may be needed to replace plants damaged by flooding or saltwater intrusion. Areas of the buffer that experience repeated damage may require a more robust engineered design to better withstand storms and high tides.
- If necessary, mount signs along the edge of the planted area that indicate it is a “no mow zone.” If the area has traditionally been mowed, it may be necessary to install temporary fencing to reinforce this message and to protect newly planted seedlings.

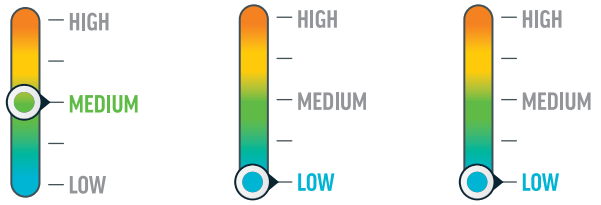
Limitations

- In more-developed urban or suburban areas, establishing forest buffers can be complicated by the presence of existing development located immediately adjacent to or near waterbodies, which limits the available area.
- Occasional opposition to buffers may occur. Neighbors may express concern about the unkept look of the site, unwanted insects and wildlife, and unauthorized campers or visitors of the site.
- Buffers work best at filtering water that slowly disperses across the soil surface. Buffers are less successful where surface features and high runoff rates cause stormwater runoff to concentrate in one flow stream or bypass the buffer completely.
- Plants need regular water for at least the first two years in the summer months.



Urban forest buffer (Source: Tetra Tech)

Implementation Considerations



Cost

Additional Resources:

Delaware Nonpoint Education for Municipal Officials (NEMO) Guide to Natural Resource-Based Planning, 2005.
http://nemo.udel.edu/manual.aspx

Green Infrastructure Primer A Delaware Guide to Using Natural Systems in Urban, Rural, and Coastal Settings, January 2016.
https://documents.dnrec.delaware.gov/GI/Documents/Green%20Infrastructure/Green_Infra_Primer2016_FINAL%20web%20version.pdf

Riparian Forest Buffer Incentive Program. https://dnrec.alpha.delaware.gov/watershed-stewardship/nps/forest-buffer-incentives/

Environmental and Homeowner Benefits

Biodiversity/Habitat Improved

Shade Increased/
Noise Pollution Reduced

Contaminants Reduced

Stormwater Runoff Reduced

Erosion Control

Stream Health Improved

Flood Control/Reduction