Vernal Pools

Description

Vernal pools and their surrounding 650' life zone. Vernal Pools are small (generally less than one acre), ephemeral pools that occur in natural basins within upland forests. They typically have no permanent inlet or outlet streams and have very small watersheds. Vernal pools are defined by the physical and hydrologic characteristics of the basin and by the animal species associated with the pool, including mole salamanders, wood frogs, and invertebrates.

Ecological Function

Vernal pools are best known as critical breeding habitat for mole salamanders (spotted salamander, blue-spotted salamander, and Jefferson salamander), eastern four-toed salamander, and wood frog. These species are considered vernal pool indicator species, meaning they cannot reproduce without access to a vernal pool. All these species migrate to vernal pools for spring breeding from adjacent upland forests where they spend the majority of their life cycles. Eggs are laid in the pools and amphibian larvae develop and mature there and then move to the adjacent forest. Studies indicate that the majority of the amphibians using a pool for breeding are found within 650 feet of the pool during the non-breeding season (Semlitsch 1998). Vernal pools are also important for other species, including fairy shrimp, fingernail clams, spring peepers, American toad, and several plant and wildlife species. Vernal pools and the species that rely on them are particularly vulnerable to hydrologic changes to their small watersheds. For example, development and climate driven changes in runoff volume and pool duration may render them less suitable amphibian breeding habitat.

Priority Target for Maintaining an Ecologically Functional Landscape

All vernal pools that are regularly used by spotted salamander, Jefferson salamander, bluespotted salamander, or wood frog.

Highest Priority: All vernal pools within a VCD highest priority forest block or the VCD highest priority surface water and riparian areas, that are regularly used by spotted salamander, Jefferson salamander, blue-spotted salamander, or wood frog.

Guidelines for Maintaining Ecological Function

Maintain or enhance conditions in and around the pool for pool-breeding obligate species. The pool's small watershed should have little if any alteration to natural hydrology that would affect runoff volume, pool duration, or water quality. The pool structure should be unaltered by, or mostly recovered or restored from, past human disturbances. Maintain or restore a closed forest canopy with native species, abundant coarse woody debris, and a lack of artificial barriers to salamander movement in the 650 feet of forest adjacent to the vernal pool.

Restoration Needs

As with other wetland types, many of Vermont's original vernal pools have been lost to development or other land uses. Restoration of vernal pools may be beneficial in some parts of the state.

Methods and Rationale

Vernal pools contribute unique ecological functions. Those that occur within the highest priority landscape scale elements of Vermont Conservation Design are most likely to provide for the full life needs of pool obligate species.

Mapping Comments

The map layer is an incomplete representation of the priority and highest priority targets. Mapping represents the best current knowledge of the location of targets on the ground. Vernal pool mapping includes pool locations and the 650' upland forest zone. Mapped data include both confirmed pool locations and locations that have a very high likelihood of pool occurrence and are noted as such in attribute data. Field verification is needed to confirm that these likely pools meet the target criteria and provide appropriate ecological functions. Additional target pools exist that are not represented in the map data.

For more information

For more information specific to this component, contact Vermont Fish & Wildlife Department, Jens Hilke, at 802-461-6791, jens.hilke@vermont.gov and Bob Zaino, at 802-476-0128, Robert.Zaino@vermont.gov