Lake Creek Valley

This site is delineated around Lake Creek and the extensive associated wetlands that feed Sugar Lake. This is an extremely biologically diverse area that provides habitat for numerous rare species of birds and several natural communities of biological significance. The valley lies entirely within the Erie National Wildlife Refuge (ENWR) and has been named an Important Bird Area (IBA) by the Pennsylvania Audubon Society. The Western Pennsylvania Conservancy performed extensive surveys of the plants, animals, and natural communities within the refuge for the ENWR Natural Heritage Inventory Report (1994).

Lake Creek is a low gradient clearwater creek that meanders throughout the nearly level vegetated stream valley floor. This creek has a sparsely vegetated channel with floating, submerged, and emergent vegetation. The width of the stream ranges from 10 to 30 feet with a silty, clayey substrate. Cow lily (*Nuphar luteum* var. *variegatum*) is scattered along the edges of the stream channel, cow lily also forms aquatic beds throughout the creek. Other aquatic vegetation includes floating brownleaf (*Potamogeton natans*), leafy pondweed (*P. foliosus*), large-leaved pondweed (*P. amplifolius*), a water milfoil (*Myriophyllum spicatum*), a lesser duckweed (*Lemna minor*), bladderwort (*Utricularia* sp.), greater duckweed (*Spirodela polyrhiza*), coontail (*Ceratophyllum* sp.), and bur-reed (*Sparganium* sp.).

Lake Creek meanders through a valley of extensive freshwater wetlands. Areas of beaver activity are common throughout. Notable communities within the wetland complex are a **mixed forb marsh community** and a large **alder-ninebark wetland**. For the most part, the marsh is inundated. The substrate is silty with a large amount of organic debris, forming vegetated mats in some areas. The marsh is dominated by grass-like plants and emergent vegetation with large beds of cow lily. The periphery of the marsh is lined with scattered shrubs, giving way to shrub swamps and palustrine forests. The alder-ninebark wetland contains more shrubs, including *Cornus amomum*, *Spiraea alba*, and *Salix nigra*, as well as *Carex* spp. and *Rubus* spp. Occurrences of **Clinton's wood fern** (*Dryopteris clintoniana*) and **paper pondshell** (*Utterbackia imbecillis*) were also found in this area.

The mixed forb marsh is dominated by cow lily, sedges (*Carex comosa*, and *C. crinita*), great bur-reed (*Sparganium eurycarpum*), smartweeds (*Polygonum* spp.), mild water pepper (*P. hydropiperoides*), common cattail (*Typha latifolia*), and duckweed. Scattered shrub patches are populated by meadowsweet (*Spiraea alba*), swamp rose (*Rosa palustris*), silky dogwood (*Cornus amomum*), speckled alder (*Alnus rugosa*) with widely scattered snags and trees including eastern hemlock (*Tsuga canadensis*), black ash (*Fraxinus nigra*), black willow (*Salix nigra*) and elms (*Ulmus* sp.). The herbaceous layer here contains common cattail, rice cutgrass (*Leersia oryzoides*), water pepper (*Polygonum hydropiper*), halberd-leaved tearthumb (*P. arifolium*), skunk cabbage (*Symplocarpus foetidus*), three-way sedge (*Dulichium arundinaceum*), and great bur-reed. An occurrence of **downy willow-herb** (*Epilobium strictum*) is also found near this marsh.

A second notable community within the wetland complex of Lake Creek valley is a circumneutral shrub swamp. This swamp was originally forested; however, beaver activity has noticeably affected the hydrology and vegetation of the riparian areas, thus creating a shrub swamp. This community exhibits exceptional floral diversity. Dominant species include meadowsweet, swamp rose, speckled alder, willows (*Salix* spp.), winterberry (*Ilex verticillata*), red maple (*Acer rubrum*), jewelweed (*Impatiens capensis*), rice cut-grass, spotted joepye weed (*Eupatorium maculatum*), smartweeds, mild water pepper, arrow-leaved tearthumb (*Polygonum sagittatum*), and water purslane (*Ludwigia palustris*). Other associates include various sedges (*Carex crinita,*

C. tribuloides, *C. scoparia*, and *C. lurida*), great bur-reed, sensitive fern (*Onoclea sensibilis*), and common cattail. Silky dogwood, cow lily, skunk cabbage, boneset *(Eupatorium perfoliatum*), arrowhead (*Sagittaria* sp.), wild mint (*Mentha arvensis*), northern arrowwood (*Viburnum dentatum*), and halberd-leaved tearthumb are also common occurrences throughout the swamp.

A **red maple – black ash palustrine forest**, a community of special concern, is located along the northern section of Lake Creek. Skunk cabbage (*Symplocarpus foetidus*) and sedges (*Carex* spp.) are common in the herbaceous layer.

Just along the north bank of Lake Creek, upstream from Sugar Lake, **a mixed forb marsh**, a natural community of special concern is present. This community, dominated by broad-leaved plants, is commonly associated with wet meadows and a variety of other wetland types (Fike 1999). Distinctive vegetation includes three-way sedge (*Dulichium arundinaceum*), tearthumbs (*Polygonum* spp.), beggarticks (*Bidens* sp.), jewelweed (*Impatiens capensis*), sensitive fern (*Onoclea sensibilis*), arrowhead (*Sagittaria latifolia*), and rice cutgrass (*Leersia oryzoides*). Successional processes give way to a **hemlock- mixed hardwood palustrine forest** on the periphery of the marsh.

Hemlock-mixed hardwood palustrine forests are characterized by a pit and mound microtopography, with pools of standing groundwater. Fike describes this community as dominated by eastern hemlock (*Tsuga canadensis*), with white pine (*Pinus strobus*), red maple (*Acer rubrum*), yellow birch (*Betula allegheniensis*), ash (*Fraxinus* sp.), red oak (*Quercus rubra*), white oak (*Q. alba*), and American beech (*Fagus grandifolia*) present in smaller amounts (1999). A dense understory is formed by rhododendron (*Rhododendron maxima*), with occasional highbush blueberry (*Vaccinium corymbosum*) and winterberry (*Ilex verticillata*). The herbaceous layer, which grows from a well-developed layer of sphagnum moss (*Sphagnum* spp.), is sparse but includes several fern species (*Onoclea sensibilis, Osmunda cinnamomea, and O. claytonia*), violets (*Viola* sp.), Canada mayflower (*Maianthemum canadense*), and Indian cucumberroot (*Medeola virginiana*).

The rich plant diversity throughout this wetland complex creates a variety of habitats for numerous bird species, both common and rare. Specifically, this is ideal habitat for marsh birds, a group of birds that have experienced recent declines due to habitat fragmentation, elimination, and water pollution. Many birds use this extensive wetland complex during the breeding season, including the **marsh wren** (*Cistothorus palustris*), a species of concern. Additional surveys may show that other wetland bird species are breeding in the wetland surrounding Lake Creek. **Two additional species of concern** were also found at this location.

The hydrology of this wetland, which is linked to the surrounding uplands, is crucial to supporting the plants and communities that provide habitat to these bird species of concern. The immediate watershed that is being drained by Lake Creek is considered the supporting landscape for this site. The portion of the Lake Creek Valley watershed considered for this area includes portions of the Erie National Wildlife Refuge (ENWR), some larger forest blocks and a small amount of farmland which is common along the major roads within the watershed.

Threats and Stresses

The entire core area of this site falls within the limits of the ENWR and is therefore protected from inappropriate development. Invasive plant species within the wetland pose a threat to native plant species and the habitat they create for nesting birds. Reed canary grass (*Phalaris arundinacea*), which has become established near the intersection with Route 173, will become aggressive and spread rapidly throughout the wetland if not managed appropriately. Invasive

species such as this are commonly dispersed via disturbed areas such as roadsides. Once established at a site, invasives typically colonize quickly and out-compete native plants for resources, therefore reducing native plant populations and diversity. Other invasives that could be problematic within this wetland are purple loosestrife (*Lythrum salicaria*) and common reed (*Phragmites australis*). Furthermore, human disturbance to bird species of concern during the breeding season could lead to nest failure and would be highly detrimental to these bird populations.

At the landscape level, runoff from surrounding agricultural lands and major roads, such as Route 173, which bisects the wetland, could potentially alter the integrity of this habitat. Nutrient or chemical loading from these sources could drastically impact the water quality, thus changing plant and animal populations at the site. Any gross change in the hydrology of this creek would be detrimental to the species and communities of conservation concern located within this area.

Recommendations

Current management by the USFWS should afford protection to this wetland complex. Human disturbance should be minimized during breeding season, approximately April-June. Continued efforts should be allocated towards invasive plant species monitoring and removal throughout the wetland. Best management practices should continue to be applied to surrounding agricultural lands. Monitoring the wetland and roadside conditions for invasive species and erosion problems where Route 173 crosses would be advisable.