Priority Parcel Analysis Summary and Criteria: A process for Permanent Land Protection in the Burt Lake Watershed

Tip of the Mitt Watershed Council, May 2015

Summary:

Properly managing high-quality water resources requires addressing known sources of pollution and reducing future sources. Although effective regulation and strong stewardship ethics reduce the adverse impacts of development and land management to our surface waters, the permanent protection of sensitive lands is potentially the most effective tool for long-term water quality and aquatic ecosystem protection. Permanent protection of sensitive areas helps maintain the ecological integrity of our lakes, streams, and wetlands, and arguably provides the most positive impact per conservation effort. Permanent protection is best achieved through purchase, donation, or conservation easement.

Tip of the Mitt Watershed Council's Priority Parcel Analysis comprehensively ranks individual land parcels using a quantitative scoring system that reflects each parcel's ecological value. While the process is a holistic approach to ecological evaluation, special emphasis is placed on the protection of water resources. Anthropogenic variables pertaining to development are also used in the criteria to frame the rankings from a land acquisition and preservation standpoint. The Analysis is done entirely in a Geographic Information System (GIS), using commonly available spatial data. Many of the data layers used in the analysis were obtained from the Michigan Geographic Data Library. A portion of the data is supplied by partner organizations and government agencies, including parcel datasets from county GIS or equalization departments, and protected lands from local conservancies.

Parcels within the Burt Lake Watershed were analyzed and ranked based on variables considered important for protecting and improving the quality and ecology integrity of the Watershed's aquatic ecosystems, and to some extent, terrestrial ecosystems. Descriptions of scoring criteria and the point system used to assign priority rankings to parcels are described below. The scores for each criterion were summed to produce a total score for each land parcel.

Parcel Size: Larger blocks of contiguous land typically have higher ecological value due to their potential to harbor a greater diversity of species and habitat types. Permanent protection of large parcels is also more time and cost effective than protecting small parcels. The selection threshold for parcel size criteria during this process was 10 acres. The larger the parcel, the more points it received.

Ground Water Recharge Potential: Ground water discharge is essential for the maintenance of the cold-water fisheries that prevail in watersheds of the Northern Lower Peninsula. Land with highly permeable soils allows precipitation to percolate through the soils and recharge ground water supplies. Predominant soil type and associated permeability were determined for each parcel using the physical properties found in county soil surveys (Natural Resource Conservation Service, Emmet and Charlevoix Counties). Parcels were scored based on the extent (acreage) of soils conducive to ground water recharge.

Wetlands: Wetlands provide a variety of important functions that contribute to the health of the watershed, including fish and wildlife habitat, water quality protection, flood and erosion control, and recreational opportunities. National Wetlands Inventory data were utilized to determine the acreage of wetlands on individual properties and assign scores.

Lake and Stream Riparian Ecosystems: Activities on land immediately adjacent to a waterbody are critically important to maintaining water quality and ecological health. Properties with lake or

stream shorelines were given scores based on total shoreline distance contained within the parcel.

Steep Slopes: Steep, highly erodible slopes are particularly vulnerable to improper use. Large amounts of erosion can degrade terrestrial habitat and impact water quality through sedimentation. Parcels with slopes greater than 20% scored points in this category.

Protected Land Adjacency: Properties adjacent to protected lands, such as state forests or conservancy lands, have a high ecological value because they provide a buffer to preexisting protected lands. They also increase the contiguous protected area, which essentially expands the biological corridor for species migration and interaction. Parcels bordering local or state government land and conservancy properties were identified and scored based upon the number of sides on the parcel adjacent to protected lands. Properties that linked two separate protected land parcels, or doubled the size of an existing parcel, received additional points.

Threatened or Endangered Species (state or federally listed): The protection of threatened and endangered species is important because many species are indicators of environmental quality and other dependent species could be affected. The Biological Rarity (Biorarity) Index model, developed by the Michigan Natural Features Inventory, provides an estimate of occurrence based on known sightings of threatened, endangered, or special concern species and high quality natural communities. Priority scores were based on model predictions for occurrence of threatened and endangered species or habitat types on the parcel.

Proximity to Development: Properties near urban areas have a high conservation value due to the imminent threat of development. Because these properties are near population centers, they have the greatest potential for public use and provide the most gain in terms of ecosystem preservation. NOAA CCAP (Coastal Change Analysis Program) land cover data and MGDL municipal boundary data were used to identify urban areas and growth corridors. Parcels were scored based on proximity to these areas.

Natural Land Cover Types: Land in its natural state is more ecologically valuable than altered land because natural land cover tends to contains a greater diversity of habitat and species, and is more resilient to invasion by non-native species. NOAA's CCAP land-cover dataset was used to determine a percent coverage of natural land cover types for each parcel. Parcels with greater than 50% natural land cover received points.

Drinking Water Protection Areas: Wellhead protection areas are critical recharge zones that maintain aquifer water supplies and sustain local municipal drinking water systems. Development within these areas can jeopardizing water sources by contaminating water supplies or inhibiting the infiltration of rain water. Points were assigned to parcels that lie within wellhead protection areas and based on the percentage of the parcel within the area.

Exceptional Resources: This criteria provides a fixed, two point score increase to any parcel adjacent to an exceptional resource. Exceptional resources are locally occurring conditions that are rare, vulnerable to degradation, and have high intrinsic value. The following were identified as critical resources for this analysis: critical dunes, blue-ribbon trout streams, forests with an average age of greater than 90 years, and undeveloped lakes.

Road Visibility via Roadway: This scoring system places value on access for the general public. While it is not an ecological criteria, it evaluates the potential for use by the public. It also helps quantify the gains associated with road-side improvements such as interpretive signs and parks.

Criteria for Prioritization and Scoring:

1. **Parcel Size (acreage)** ***(GIS Field "acre_scr")***
    1) Acres >= 10 AND acres < 20 — 1 pts
    2) Acres >= 20 AND acres < 40 — 2 pts
    3) Acres >= 40 AND acres < 80 — 3 pts
    4) Acres >= 80 — 4 pts
2. **Groundwater Recharge Potential (acreage)** ***(GIS Field "gw_rcg_scr")***
    1) Groundwater Recharge Acres >= 0 AND < 5 — 1 pts
    2) Groundwater Recharge Acres >= 5 AND < 10 — 2 pts
    3) Groundwater Recharge Acres >= 10 AND < 20 — 3 pts
    4) Groundwater Recharge Acres >= 20+ — 4 pts
3. **Wetland Preservation (acreage)** ***(GIS Field "wetld_scr")***
    1) Wetland Acres > 0 AND < 2 — 1 pts
    2) Wetland Acres >= 2 AND < 5 — 2 pts
    3) Wetland Acres >= 5 AND < 10 — 3 pts
    4) Wetland Acres >= 10+ — 4 pts
4. **Lake Shoreline/Riparian Protection (linear feet)** ***(GIS Field "Lk_Scr")***
    1) Lake Shore Distance > 100' AND < 200' — 1 pts
    2) Lake Shore Distance >= 200' AND < 400' — 2 pts
    3) Lake Shore Distance >= 400' AND < 600' — 3 pts
    4) Lake Shore Distance >= 600' — 4 pts
5. **River and Stream Shoreline/Riparian Protection (linear feet)** ***(GIS Field "stream_scr")***
    1) Stream Distance >= 100' AND < 500' — 1 pts
    2) Stream Distance >= 500' AND < 1000' — 2 pts
    3) Stream Distance >= 1000' AND < 2000' — 3 pts
    4) Stream Distance >= 2000' — 4 pts
6. **Steep Slopes for Erosion Prevention** ***(GIS Field "slope_scr")***
    1) Slopes >= 20 and < 30% — 1 pts
    2) Slopes >= 30 and < 35% — 2 pts
    3) Slopes >= 35 and < 40% — 3 pts
    4) Slopes > 40% — 4 pts
7. **Proximity to Protected Lands (Wildlife Corridors)** ***(GIS Field "protct_scr")***
    1) Parcel edge within 250' of conservation lands — 1 pts
    2) Abutting conservation land — 2 pts
    3) Linking conservation land — 3 pts
    4) Adjacent to conservancy lands and doubles size — 4 pts

8. **Threatened/Endangered Species (using MNFI model)** ***(GIS Field "endang_scr")***
    1) Probability = 'Low' AND "RI" >= 3 AND "RI" < 4 — 1 pts
    2) Probability = 'Low' AND "RI" >=4 — 2 pts
    3) Probability = 'Moderate' AND "RI" >=0 — 3 pts
    4) Probability = 'High' AND "RI" >=0 — 4 pts

9. **Proximity to Development (CCAP land cover = "Developed")** ***(GIS Field "devpres_scr")***
    1) Adjacent to any "developed" land cover — 1 pts
    2) Within 2.5 miles of City Development or .75 miles of non-incorporated development — 2 pts
    3) Within .75 miles of City Development — 3 pts
    4) Within City Development — 4 pts

10. **Natural Land Cover Types (CCAP = non-agriculture, non-developed)** ***(GIS Field "NatPct_Scr")***
    1) Natural Land Cover >= 50% AND < 70% — 1 pts
    2) Natural Land Cover >= 70% AND < 80% — 2 pts
    3) Natural Land Cover >= 80% AND < 90% — 3 pts
    4) Natural Land Cover >= 90% — 4 pts

11. **Drinking Water Protection Areas** ***(GIS Field "wellHD_scr")***
    1) Wellhead Protection Area >= 1% and < 20% — 1 pts
    2) Wellhead Protection Area >= 20% and < 35% — 2 pts
    3) Wellhead Protection Area >= 35% and < 50% — 3 pts
    4) Wellhead Protection Area > 50% — 4 pts

12. **Exceptional Resources** ***(Multiple GIS Fields)***
    1) Lakeshore w/Shoreline <= 25 parcels/mile average — 2 pts
    2) Intersects a Blue Ribbon Trout Stream — 2 pts
    3) Intersects Critical Dune Habitat — 2 pts
    4) Contains Forest Aged 90+ Years* — 2 pts

13. **Public Visibility (road access)** ***(GIS Field "RdVis_Scr")*****
    1) Road Distance >= 400' AND < 700' — 1 pts
    2) Road Distance >= 700' AND < 1000' — 2 pts
    3) Road Distance >= 1000' AND < 1300' — 3 pts
    4) Road Distance >= 1300' — 4 pts

*Criteria omitted from total score due to non-comprehensive data.
**Criteria omitted from total score due to non-ecological theme.