Natural resource inventory of the Great Pond Mountain Wildlands, Orland, Maine

For

Great Pond Mountain Conservation Trust
P.O. Box 266, Orland, ME 04472
greatpond@midmaine.com
Submitted to Cheri Domina, cdomina@midmaine.com on 11.02.06

By

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20 December 2006

Some text has been deleted to protect sensitive areas/species.

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SUMMARY: Alison C. Dibble (Stewards LLC) partnered with ecologist Catherine Rees to conduct a 6-month natural resource inventory of Great Pond Mountain Wildlands. This new 4200-ac preserve is operated by the Great Pond Mountain Conservation Trust, and consists of wetlands and upland forests which are recovering from recent heavy harvest with large patches of clear cutting. We used a GIS to prepare a database on which we established boundaries of the natural communities, observations collected by volunteers and ourselves in 2006, and 16 monitoring points. We subcontracted Michael Good, avian ecologist, to help identify bird habitats, and Jane Clifton, archaeology student, who prepared a preliminary report on archaeological features at two sites in the Wildlands. Seventy nine species of birds were found, some featured by the federal Gulf of Maine Watershed Habitat Study. Of the 14 vegetation communities found on the property that are recognized by the Maine Natural Areas Program, the three-toothed cinquefoil - blueberry low summit bald (imperiled in Maine) is especially at risk due to trampling. We found more than 400 species of vascular plants including two listed rare plants. Other sensitive features include bald eagle (seen), woodcock (seen), and whip-poor-will (heard); legacy trees; vernal pools; and beaver flowages. Problems include serious erosion at the roads which could impact brook trout spawning habitat, and ten species of non-native invasive plants that require immediate control. Sustainable forestry can be conducted throughout the Wildlands with an emphasis on restoration and canopy closure in parts of the propterty designated as special management areas. Volunteers can serve in many capacities during the restoration process and are likely to derive satisfaction from their involvement. Restoration will involve canopy regrowth with a succession of legacy trees, erosion control, invasive plant control, and expansion of the few existing stream buffers. The GIS can be expanded over time.

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BACKGROUND

Great Pond Mountain Wildlands in Orland, Hancock County, Maine, totals 4200 ac and is made up of two large, separate parcels (Figure 1), one at Hothole Valley (3420 ac) and the other at the east side of the Dead River (810 ac). These lands were protected in 2005 by the Great Pond Mountain Conservation Trust (GPMCT), a 501(c)(3) organization that formed in 1993 to protect ecologically significant lands in Orland from further fragmentation and potential residential development.

The Wildlands (GPMW) consist of recently harvested forest, hill tops, valleys, river shore, pond shore, and numerous wetlands, streams, shrub openings and log landings. Much of the property has been recently harvested for timber. Few areas and habitats were not directly affected by harvest activities. A 16-mile network of logging roads that were apparently built with local gravel and sand deposits from the property offers access for recreation, forestry, and other management activities. The roads vary in their condition; some are washed out but remain passable on foot.

The purpose of this inventory was to detect sites that require special management considerations, and provide a baseline by which future observations can be compared. A GIS dataset was established, to which other information can be added later. We coordinated with Jake Maier Forestry so that the forest management plan he is preparing reflects features identified in the natural resource inventory, and avoids duplication. Because the forestry report is scheduled for submission some months after the completion of this inventory, Maier will reference this report later, and we are offering our recommendations without overview and specifics that he will provide to GPMCT.

The GPMCT goals for managing the Wildlands were provided to us by Cheri Domina:

1. Natural resources. Maintaining and enhancing wildlife habitat, water quality, and forest resources are the first priority.

2. Recreation. Providing opportunities for low-impact recreation in appropriate areas.

3. Scenic views. Maintaining select important views through forest and trail management.

4. Education. Offering opportunities for environmental education and group projects that benefit school and community groups as well as the Wildlands.

5. Sustainable income. Restoring healthy forests and creating income from forest products.

The first two items are ordered by priority, while the latter three are not yet prioritized. We used these goals as our guide as to what the Trust hopes to get from this inventory. We took a long view of 50 years or more. No one can predict all the issues and changes that will affect management planning and implementation over such a time frame (e.g., build-out and urbanization, global warming, tree diseases such as chestnut blight and beech bark scale disease complex). With the data reported here, GPMCT will have a solid baseline dataset upon which to base management decisions. We framed our recommendations based on our observations of management successes, undue human impacts, and some apparent failures at other conservation

lands especially in Maine, but also in Maryland, Massachusetts, New Hampshire, New York, Virginia, Vermont, Wyoming, northern California, Washington, and Hawaii.

METHODS

We obtained data from existing resources and from field surveys. We used information from the Maine Office of GIS, including orthophotographs, topography, wetlands, soils, drainage divides, and hydrology. We obtained boundaries from GPMCT and a digital file from Plisga and Day (Figure 1). We helped design a series of volunteer data sheets so that the information gathered by volunteers as baseline data could be as standardized as possible. We suggested a series of observation points that were adopted by friends of the GPMCT so that multiple observations could be made at given sites. For this report, we compiled the lists of birds (Table 1) and other animals (Table 2)noted by the volunteers.

We collected field data in meander surveys, and assigned community types based on descriptions by the Maine Natural Areas Program (Gawler and Cutko, 2004) where possible. Other habitat types not included in that system but often of significance (e.g., road sides, log landings, beaver flowages) were noted and their vegetation described. We obtained locations using a GPS for any special features, unusual plants, management concerns, and for a series of monitoring points.

Visits were timed to capture plant and animal diversity. We compiled plant lists for each community type and refined these with subsequent visits. At least one of us visited on each of the following dates: March 19, April 19, 29; May 5, 9, 13, 17, 18, 20; June 12, 13, 17, 25; July 5, 14, 25, 26; Aug 10, 12, 19, 25, 26; Sep 1, 2, 16, 18, 20; Oct 14, 21, 26, 27. This included a visit by boat on Sept 9.

During the first visits we prepared a reconnaissance of each parcel, began notes for the plant list, watched for potential to document vernal pools (Calhoun and deMaynadier 2004), and sought to identify incidental migrant and breeding birds, spring ephemerals and violets. In July we identified grasses and sedges as they matured and continued expanding the plant list (names follow Haines and Vining 1998). In August-October we identified goldenrods and asters, completed the field notes for the plant list, and completed the natural community type map. On each visit we recorded locations by GPS of any rare plants or other sensitive features such as vernal pools, legacy trees, or significant wildlife habitat, and threats such as soil erosion, invasive species, dumping, inappropriate human use, or other problems..

In 16 locations that represent a variety of community types, we established one or more monitoring points that can be revisited and used for monitoring in the future. At each point we recorded the location by GPS, and took four photos – one in each cardinal direction. We estimated percent areal cover of dominant vegetation (more than 10 percent cover by stratum) for trees, saplings, shrubs, and herbs. We included information about soils, slope, and aspect. In forest stands we recorded information such as presence of stumps, evidence of disease or insect pests, and overall health of trees. Wildlife attributes were assessed using recommendations of DeGraaf and Yamasaki (2001). Direct observations of animals or birds, or of their evidence (e.g., scat, tracks, nests, or remains) were recorded.

We assembled all the above information into this report, and compiled the data into a GIS from which we created maps. Many data points recorded with GPS during the survey were incorporated into the GIS and subsequent maps showing their locations. All GPS and mapping

was done using the Universal Trans Mercator projection (UTM) North American Datum (NAD) 83, Zone 19. With the help of orthophotos and field data, we delineated community types by digitizing outlines of the various community types on the screen.

RESULTS

We found a large diversity of habitats, wildlife features, natural vegetation communities, vascular plants, and other noteworthy natural resource features at the Wildlands. This diversity is due in part to the varied topography, especially in the Hothole Valley parcel. Steep and heterogeneous topography contributes to the number and sizes of unusual habitats such as drainages, the exposed bedrock at the mountain summits, south- versus north-facing exposures, and the deeper soils on the upper side slopes. The wildlife habitats in the Wildlands are of exceptional quality, especially the many wetlands. An abundance of huge boulders with overhangs and crevices might serve as dens; some boulders are erratics of undetermined origin, others may be from nearby, there is some granite talus below Hedgehog Hill and possibly on the southwest slope of Hothole Mountain. The extent of such habitat is unusual in coastal Maine, except at Acadia National Park.

Management concerns that we identified (below) mostly stem from impacts due to the recent timber harvest that was conducted prior to the purchase of the land by the GPMCT. These include erosion of sediment into streams, small populations of non-native and highly invasive plants, the lack of an overstory throughout most of the forest, scarcity of large trees and logs, , and compromised stream buffers. A restoration of the Wildlands would consist of allowing the overstory to grow back, preventing further stream degradation from runoff events, controlling invasive plants, and placing emphasis on protecting stream buffers. By turning its focus to a restoration strategy, we are confident that GPMCT will gain support from current and new members who will be able to enjoy the process and the results. Most activities we suggest can be handled by volunteers. We offer descriptions and management recommendations below.

Land use history. The records we found so far indicate that the Hothole Valley parcel was not settled or farmed except at the southern end at what is now Rte 1, where Mrs. Armor had a residence (Colby 1881, map of Orland Figure 2). We think the cellar hole for that home can be found east of the south gate, where lilac bushes and an apple tree persist. The Dead River parcel appears to have been managed for timber. In a map from 1881, an intended route for a rail line is shown that would pass along the wetland at the east end of Hell Bottom Swamp, but this was never built. Recreation, hunting and fishing have been part of the uses of the Wildlands over the past century or perhaps much longer. Indeed, hunting and fishing were probably carried out on the property for thousands of years by Native Americans.

Two seasonal camps are abutting but not legally accessed over the property. One is at xxxxxx, while the other exists on Town tax maps at the junction of xxxxxxx, but the “owner” has no legal access and no legal title.

Richard A. Carlson, Bucksport, has begun preparing some history notes for GPMCT based on archives at the Orland Historical Society and other sources. He recently learned that W. C. Doan Candage owned part of the property and operated three kilns near Oak Hill, and Sabriny Hill (off the property?) though dates and some other details are lacking (Sawyer 2003). Mr. Candage, a nonresident, apparently hired Bob Irvine to supervise the woods operation and manage the burns; the charcoal was sent to Bar Harbor and shipped from there.

The land appears to have been used principally for lumbering, and in recent years was owned by Diamond Occidental Forest Inc., known locally as "Diamond Match". Diamond sold the property in 1995 to Dale Henderson Logging, who conducted a major timber harvest and then offered the property for sale in 2000. Logging ended on much of the property by 1998. On Feb 1 2001, Bio Resource Management, Inc. of Orrington, ME, responded to Cheri Domina's request for current stumpage value of the Hothole Valley parcel. Timber Management and Harvest Plans had been prepared in 1997 and 1999 for 3087 acres of the total ownership. Among other estimates, there was 29,119 cords of standing hardwood timber, 3,598 cords of hemlock, and 2,888 cords of spruce that were available for pulpwood, with 200 acres of buffer strips, 200 acres of clear cuts, and 90 acres planted to red and white pine that in 2001 was 1-4 years old.

In 2000, Cheri Domina proposed that the property should be considered for state purchase as a State Game Management Area. Hothole Brook and Pond had been rated High for Waterfowl and Wading Bird Habitat (MDIFW ID# 050228; see Figure 3). Hothole Brook was rated Moderate for Waterfowl and Wading Bird Habitat (MDIFW ID# 050229). Significant wetlands were noted for "near Hothole Brook". A visit to the property from Steve Spencer in 1967 of Maine Bureau of Parks and Lands resulted in his rating of the Hothole Valley area as moderate to moderate high for recreation.

We sought information from the Maine State Historic Preservation Office regarding a rich heritage of nearby archaeological sites at Alamoosook Lake and Toddy Pond (Moorehead 1922), and subcontracted Jane Clifton (in her fourth year of archaeology studies at the University of Maine, Orono) to advise regarding the possible archaeological significance of the outlet of Hothole Brook into Hothole Pond, the east shore of the Dead River, and any other features. Her preliminary report based on her visits in October 2006 can be found in Appendix III.

Watersheds. Two major watersheds are included in the Wildlands (Figure 4), and both empty into Penobscot Bay. Most of the area is part of the Penobscot River drainage, via Hothole Pond, which is joined by Moosehorn Stream and flows into the Dead River, through Alamoosook Lake, down the Narramissic River, into the Orland River, and then into Penobscot River. The property includes 750 ft of frontage at the south shore of Hothole Pond. Two named streams in the Wildlands are Hothole Brook, which has several unnamed year-round tributaries in Hothole Valley, and Gold Brook on the northwest slope of Great Pond Mountain. A small area at the height of land on the east boundary is in the Union River drainage, and flows into Branch Lake, down Branch Lake Stream, and into the Union River.

The elevation ranges from 29 ft to 925 ft at the summit of Flag Hill, which is the highest peak on the east side of Hothole Valley. The second highest elevation on the east side of the valley is the eastern flank of Flying Moose Mountain at 886 ft just below the summit. On the west side of Hothole Valley is the summit of Great Pond Mountain at 1020 ft (not on the property). Ownership of the Wildlands extends to 680 ft on the southeast flank of the mountain. In the Dead River parcel, elevation ranges from 29 ft at the shore of the Dead River to 700 ft on the northwest slope of Great Pond Mountain.

Geology. The Bedrock Geology of Maine map (Osberg *et al.* 1985) shows the entire Wildlands property as a single rock type from the Devonian era. Kendall (1987) indicates that the Wildlands are in a part of Orland that contains "outcrops of sheeted, coarse-grained granite, part of a large pluton stretching to the north…" and called "Lucerne granite". Promontories of granite

are known now as Flag Hill, Oak Hill, Hedge Hog Hill, Hothole Mountain, Flying Moose Mountain and, of course, Great Pond Mountain. Glacial advances occurred four times or more over the past one million years (Kendall1987), and each time they plucked bedrock at the north and northwest sides of these knobs, and deposited boulders on the slopes to the south and southeast. Some of these massive boulders were moved a considerable distance by the ice from their place of origin, and are called erratics. These form an extensive boulder field in south west Hothole Valley. The Wildlands were covered by the Wisconsin ice sheet, which advanced from northwest to southeast until perhaps 13,000 years ago. Because of the bowl-like and narrowing shape of Hothole Valley, surrounded by bedrock protuberances such as Oak Hill and Mead Mountain, it is possible that glacial retreat was slowed here compared to open flatlands along the coastal plain. This could explain the accumulation of huge rocks at various places in the Wildlands. Gravel was deposited as the glacier melted back, providing the material that was apparently used to build the road network. No fault lines are indicated for the Wildlands or the vicinity, though the Norumbega fault runs northeast-southwest from Berwick through Orrington to Vanceboro and is well inland from Orland (Osberg *et al.* 1985).

Soils. The preponderance of soil at the Wildlands is very well suited for woodland rather than farmland (Table 3, Figure 5; legend shown in Figure 6). The Marlow and associated soils (Dixfield) that make up most of the slopes are very deep and well drained. These soils are well suited for growing hardwoods and current vegetation suggests they can support a "rich" mix that includes sugar maple and basswood. At the higher elevations, soils are composed mainly of associations of Lyman, Tunbridge and Schoodic. These are shallow soils that are better suited for growing spruce and fir. Deeper pockets support hardwoods. In the lower, less sloping areas of Hot Hole Valley, Monadnock-Hermon-Dixfield complex and Colton-Adams-Sheepscot association are found. These are deep, well drained or excessively well drained soils. They are suitable for softwoods including pine and some hardwoods such as red maple and paper birch. Hydric soils in the Valley include Kinsman, Kinsman-Wonsqueak, Brayton and Brayton-Colonel association. These are poorly drained, and mainly found on level terrain that support wetlands. Softwoods are the primary trees in these areas, though red maple can also be prominent. In the Hell Bottom Swamp, soils are mainly Wonsqueak and Biddeford Muck. They support open wetlands such as the Sweetgale-Mixed Shrub Fen. Soils adjacent to the Dead River are variable, including Buxton silt loam and Marlow fine sandy loam with Buxton being best suited for softwoods and Marlow for hardwoods. Figure 5 shows that most of the soils in the Wildlands are mapped as either "Highly erodible" or "Potentially highly erodible". This is both due to the properties of the soils and the prevalence of steep slopes. Surficial geology (Figure 7) reflects the influence of glacial retreat thousands of years ago. Lower slopes are composed of glacial till and upper slopes are mainly bedrock. An area of fine grained glaciomarine deposits can be found on the lower slopes of Great Pond Mountain.

Water quality, fish, and bivalves. The U.S. Fish and Wildlife Service operates the Craig Brook National Fish Hatchery downstream from both parcels, and uses Alamoosook Lake as an alternative to Craig Pond as its water source. Pristine, undeveloped Hothole Pond is immediately downstream from the road network recently expanded in Hothole Valley and on the Dead River parcel. We did not measure water quality. We found records that alewives, brook trout, and federally endangered Atlantic salmon are or were associated with the Narramissic watershed, and Cheri Domina told us of an elver fishery in the Narramissic River (see Table 2). The Maine Department of Inland Fisheries and Wildlife determined that Hothole Brook has brook trout spawning habitat. Land-locked salmon and brook trout were stocked in the Alamoosook Lake watershed, especially at Craig Pond in 2004 and 2005. Salmon, alewives, and American eel are

included in 91 focus species of the Gulf of Maine Habitat Study (Banner and Schaller 2001). The status of alewives and eels in Hothole Brook or other streams on the property is apparently unknown. The tidewater mucket is a state threatened species and is on record for Alamoosook Lake in 1995.

Wetlands. The National Wetland Inventory (Figure 8) features numerous wetlands associated with Hothole Brook and its many unnamed tributaries in Hothole Valley. The areas mapped as emergent marsh in Hothole Valley mostly contain Bluejoint Meadows with areas of Graminoid-Mixed Shrub marsh occupying areas mapped as scrub-shrub. Among the forested wetlands we found Hardwood Seepage Forest and Cedar Spruce Seepage Forest with pockets of Northern White Cedar Swamp. In the low lands at the south end of Dead River we found a large Northern White Cedar Swamp. The scrub-shrub wetlands shown on the map in this area were mainly composed of Sweetgale-Mixed Shrub Fen. For the most part, the recent human activities in the Wildlands have not significantly altered the area of wetland or the types of wetland we found compared with the what was mapped as late as 1992 by the National Wetlands Inventory. We did see some differences in areas that are associated with beaver flowages. These can fluctuate dramatically with beaver activity. An area mapped as forested wetland containing hardwoods at the southwestern boundary of Hothole Valley is currently open water with abundant standing dead wood due to an exceptionally wide beaver dam in that area. We found at least five vernal pools (actual number not determined because we started on the project after the ideal time had passed for finding and assessing these). One at Mead Mountain Trail was already mapped (Figure 8) and had remnants of the overstory associated with it. All contained egg masses of wood frog, some had blue-spotted and/or yellow-spotted salamander egg masses. Near these pools we heard spring peepers and toads, and volunteers have documented other amphibians are associated with some of the larger pools (Table 2). While some of the vernal pools have had some vegetation left around them during the recent timber harvest, others appear to have formed as a result of road-building and related activities. The Hothole Pond Trail passes very close to a vernal pool, but the pool might have formed in part because of impoundment caused by road construction. A more comprehensive survey of vernal pools is needed.

Terrestrial animals. Observations by volunteers, Michael Good and ourselves resulted in 79 species of birds seen or heard in 2006 (Table 1). On May 9 2006, Good found 46 species during an early wave of warbler migration. Good suggested some recommendations for management that are especially cued to bird habitat (Appendix I). Not all birds that are likely for GPMW have yet been found (Appendix II). Rare or sensitive animals included bald eagle (seen), woodcock (seen), and whippoorwill (heard). Animal observations by volunteers and ourselves are listed in Table 2.

Natural community types. We identified 14 natural vegetation community types, as described by Gawler and Cutko (2004). These types fit the descriptions of Gawler and Cutko (2004) for the most part, although some exceptions are noted in Table 3. We added three additional types: log landing, gravel pit and beaver flowage. Log landings and gravel pits are unnatural and, therefore, not included in Natural Landscapes of Maine. We created a beaver flowage community to describe a collection of dynamic community types associated with beaver activity.

Most of the property is forested (Tables 4, 5; Figure 9), and we identified the matrix (the forest type characteristic for most of the lower to mid slopes) as Red Oak-Northern Hardwoods-White Pine Forest in the Dead River parcel and Beech-Birch-Maple in the Hothole Valley parcel. The

lower elevation forest is mainly composed of Spruce-Northern Hardwoods Forest in Hothole Valley and Spruce-Fir-Wood sorrel-Feathermoss Forest at the shore of Dead River. Intact mature cedar swamps are at foot of the west slope of Condon Hill, and in Hell Bottom Swamp; cedar swamps that have had the overstory mostly removed are in the valley west of Hedge Hog Hill and intermittently elsewhere. A Hardwood Seepage Forest has had the overstory mostly removed in the saddle between Oak and Flag Hills. Hemlock Forests are in the stream buffer at Cascade Brook (Hothole Valley) and Gold Brook (Dead River parcel). The unforested community types are mostly wetlands, including Mixed Graminoid-Shrub Marsh, and Bluejoint Meadow associated with streams in Hothole Valley, and Sweetgale- Mixed Shrub Fen in Hell Bottom Swamp. Of all the types we found, we consider the most vulnerable to be the Three-toothed Cinquefoil - Blueberry Low Summit Bald, which is present in only small patches near the summits of Great Pond Mountain, West Oak Hill, Flag Hill, Hedgehog Hill, and Condon Hill. Gawler and Cutko (2004) noted that this type is under pressure everywhere throughout the state because people and ATVs trample the vegetation over bedrock. Lichens and delicate plants adapted to thin soils are unable to grow back after some threshold of foot and vehicle traffic.

Condition of the forest is variable. Patches of mid-successional northern red oak that were left standing in Dead River parcel appear to be healthy. We saw little evidence of balsam woolly adelgid attack on balsam fir, though many firs were dying (they are typically short-lived). Dense regeneration of hardwoods and softwoods appeared to have few problems other than competition from near neighbors in cut-over stands; thinning may be necessary. Throughout the property we found American beech with moderate to severe disfigurement from beech bark scale disease. We know of no proven solutions that enable this important wildlife mast tree to resist the non-native disease-insect complex that is spreading throughout the range of American beech. Some clones have more genetic resistance than others. At the Wildlands, numerous extensive thickets of beech regeneration will probably continue to be affected. Jake Maier Forestry will have alternatives that GPMCT might try. The importance of beech nuts to wildlife should be considered when deciding which tree species to favor on the landscape, given that the rich nuts of American chestnut have already been lost to wildlife (we found no evidence of chestnut in the Wildlands). We recommend that intensive efforts are worthwhile in trying to keep beech on the landscape. We noted several places where we found relatively clear beech stems that might be a starting place for revitalizing beech at GPMW.

We established 16 monitoring points that will serve as vegetation monitoring places over time. These are in 11 natural community types. Baseline data from the monitoring points are in Appendix IV. Photos taken at each point and associated data are available in the GIS.

Plants and rare plant species. We found more than 400 species of vascular plants (Table 6), of which two are listed as rare at the state level. Swarthy sedge, *Carex adusta*, is state Endangered because few populations are known, and populations of this the sedge tend to disappear when early successional habitat is (temporarily) lost to forest succession. This plant appears to depend on openings created by wildfire, or by timber harvest activities such as log landings and road building (Appendix VII). The smooth sandwort, *Minuartia glabra*, is state Special Concern. This annual herb is typically found on summits less than 3000 ft elevation. It is ranked S1/S2 by MNAP, and reaches the northern limit of its range in Maine. It grows on thin soils over ledge or gravel and along trails associated with acid bedrock balds and slopes and is often found with reindeer moss lichens(Appendix VII). It is potentially threatened by trampling and by invasive plants, especially common sheep sorrel (*Rumex acetosella*), which was found in the Wildlands.

Three unusual lichens were found in the Wildlands: (1) yellow specklebelly (*Pseudocyphellaria crocata;* now called *P. perpetua;* see Jim Hinds' communication in Appendix V) -- in a mature cedar swamp buffer near the Dead River; (2) bloody beard lichen, a type of old man's beard lichen (*Usnea mutabilis*) -- on a dead balsam fir at the Valley Road near the southern branch of Hothole Brook; (3) Shaggy-fringe lichen (*Anaptychia palmulata*) – on a 25 inch dbh northern red oak at the upper west slope of Flag Hill (see Monitoring Point 10; Appendix III). None is listed as rare for Maine, but Maine has no list of rare lichens, mosses and liverworts at this time. All are at the northern limit of their range, though bloody beard lichen is also in Nova Scotia.

Several native orchids were found, including rattlesnake plantain (*Goodyera pubescens*), heart-leaved twayblade (*Listera cordifolia*), purple-fringed orchis (*Platanthera psychodes*), and pink lady's slipper (*Cypripedium acaule*). None are considered rare but they are of interest because native orchids appear to be decreasing in their diversity in coastal Maine (see Greene et al., 2005), and because some people find orchids to be charismatic. A casual interest in orchids can develop into support for and participation in plant conservation activities such as controlling invasive plants.

The bouldery slopes on the south slopes of the mountains throughout the Wildlands offer ideal situations for dens because there are many overhanging boulders with dry, well-drained areas beneath, some are large enough for a bear to hibernate there. We found evidence of porcupine scat and gnawing marks on trees, deer tracks and scat, and coyote scat in these areas. Bear, fox and bobcat might also use these areas. It is unknown if the long-tailed shrew or rock vole occur there; these rare animals use acidic granite talus elsewhere.

Significant wildlife habitat is also found at beaver dams. We included some representative beaver flowages in the GIS that should be monitored for invasive plants. We found invasive common reed at a large beaver dam near the southwest corner of Hothole Valley and we recommend that this should be controlled.

Other unusual features. We consider the legacy trees left after logging operations to be an especially valuable feature in the Wildlands. They are integral to a fully functioning forest, have been referred to as biological legacies, and are rare in clear cuts (Table 9). They function not only as vertical structure for perches and as wildlife trees with cavities, woodpecker holes and dens, but they also have significance as insect, arachnid, microbe, fungus, lichen, moss and liverwort habitat and serve as small islands of biological diversity within a sea of early-successional forest. We found only a few large snags and living legacy trees representing various species, especially northern red oak, sugar maple, white pine, and yellow birch. The largest we saw is in the Dead River parcel; an oak 38 inches dbh, alive and with most of its canopy intact. None of these legacy trees was provided with an undisturbed area around it, and roots of the few large living trees might have been compacted or injured by machinery during timber harvest. All such legacy trees we found are exposed to wind and ice storms without the protection of the forest canopy. Their role on the recovering landscape is unmatched by any other feature on the property. Jake Maier Forestry can advise GPMCT regarding how best to protect these few trees and plan for continued presence of such large trees by identifying the next few generations of legacy trees. They should be left uncut and the eventual large log that follows is also valuable as a carbon sink that releases moisture more slowly than other features on the forest floor. Large logs provide habitat for small mammals, ground beetles, microbes, fungi, and uncountable invertebrates.

The stream buffers are sensitive, unusual features on the Wildlands. Small pockets of unharvested forest, such as in the buffer at Hothole Brook, contain a high diversity of shade-tolerant herbs, lichens, mosses, liverworts, and fungi that we did not find elsewhere, or at least not with such abundance, within the matrix of clear cut slopes and bottomlands. Many species of animals use these areas as corridors, watering places, or they make their burrows in stream banks. It appears from a forester's map (Figure 10, no date) that more buffers were to be left, but GPMCT can compensate for lack of existing stream buffers by planning that from 2006 on, buffers are designated at all streams.

Erosion problems. We found areas where the gravel from the roads is washing into and degrading streams, or where culverts are washing out. Locations of these are found in Figure 11 as Management Concerns. We pointed some of these out to the committee that went to see Cascade Brook on October 2, 2006. Erosion mediation plans need to accommodate a storm such as that of October 28, 2006. We urge the GPMCT to prioritize the fixing of these erosion problems at the earliest opportunity and have given this top priority in the Two Year Action Plan below. The worst of these areas was at the big gravel pit on Valley Road, where tons of gravel have silted the stream repeatedly. This may be a continuing problem for spawning brook trout populations. Possibly a settlement pond, such as that elaborated by the Department of Environmental Protection (Appendix VII), is a solution that would also provide wildlife habitat. A very recent problem area is on Mead Mountain Trail where the road has washed out completely and remains very unstable at the culvert where the southwest branch of Hothole Brook crosses the road.

Invasive plants. We found ten species of invasive plants in the Wildlands (Table 7). Both parcels contained unexpected small populations of some of the worst invasive plants known for Maine. These include purple loosestrife (*Lythrum salicaria*), Japanese barberry (*Berberis thunbergii*), autumn olive (*Elaeagnus umbellata*), Oriental bittersweet (*Celastrus orbiculata*), bittersweet nightshade (*Solanum dulcamara*), common bull thistle (*Cirsium vulgare*), Canada bluegrass (*Poa compressa*), common reed (*Phragmites australis*), glossy buckthorn (*Frangula alnus*), and reed canarygrass (*Phalaris arundinacea*). We found a non-native rose near the cabin at the inholding below the north gate (*Rosa* cf. *gallica*), and it appears to not be spreading (yet). For each of these we provide management recommendations based on our knowledge from other sites (Dibble and Rees 2005) and on the current practices used by natural resource managers.

MANAGEMENT RECOMMENDATIONS

Our recommendations are based in part on our experience at other protected lands, including national parks, national wildlife refuges, national forests, state parks and reserve lands, and preserves owned by The Nature Conservancy and other land trusts. The primary recommendation is that GPMCT consider strategic planning for restoration of the forest and protection of streams and brooks at the Wildlands. This includes some specifics regarding habitat protection, and maintenance of community types.

Vision for Restoration. We suggest a vision for restoration at the Wildlands should focus on four issues:

Canopy. Allow the upper forest canopy to grow back. Conduct exemplary sustainable forestry and seek support for establishing a demonstration forest. Promote the maintenance of biological legacies (large living trees, snags, large logs, intact tree regeneration, and undisturbed soils; see Table 9), which are rare in the Wildlands. Establish a plan for protecting existing legacy trees (e.g., no machinery within 100 ft of a living tree > 25 inches dbh), and for their succession. Identify the next few generations of legacy trees and protect them in small unharvested areas that are marked and recorded by GPS and left alone from one harvest rotation to the next. On better soils and where desirable tree species are present in dense young stands, conduct pre-commercial thinning to produce high quality trees for market and allow a multi-layer canopy to develop and persist at all times. Retain some openings at existing log landings as early successional habitat for woodcock display flights, but otherwise manage for eventual canopy closure with small openings that range from about ¼ - 1 ac or as advised by Jake Maier Forestry.

Buffers. Expand all stream buffers to 250 feet on steep slopes and 100 feet on either side on modest slopes. Limit forest management to low impact actions necessary to establish canopy closure and healthy regeneration. Record locations of seasonal streams and create buffers along them as well. We found many streams not shown on the USGS topographic maps, but were unable to map all of those worthy of buffers during the inventory.

Erosion. Mediate the erosion problems where the road network has compromised stream quality, and do this as a top priority for the Two Year Action Plan. Contact the Soil and Water Conservation Service for advice and/or hire an erosion control expert and follow that person's advice. Recruit and train volunteers to serve on the Erosion Control Crew. Map all culverts and monitor them regularly to make sure they are clear and functioning properly. Add additional culverts where needed. Recognize volunteers at the annual meeting and in the newsletter. Have awards. If any seeding is to be done to revegetate roads or gravel pits, use seed collected from native plants on the property.

Invasive Plants. Establish invasive plant eradication and monitoring as a top priority. Invasive plants can degrade wildlife habitat severely. Non-native grasses can increase fine fuels that contribute to spread and increased intensity of a wildfire. Most invasives can out compete native plants. Birds spread the fruits of Japanese barberry, glossy buckthorn, autumn olive, Oriental bittersweet, bittersweet nightshade, and some other invasive plants ever deeper into the forest. Management resources are offered in Appendix X. For specific management recommendations by species, not involving herbicides see Table 7. A three-pronged approach could be considered:

a. Establish a monitoring program in which (i) volunteers are trained so that they can identify the plants that must be controlled; (ii) known populations are checked every year, and (iii) new populations of invasive plants are sought even in remote, difficult-to-access areas.
b. Eradicate known populations completely. This is difficult to do – crews must go back repeatedly and hand-pull or otherwise treat the offending plants, search for more seedlings, and remain vigilant.
c. Continue monitoring over the long term. Schedule work parties and identification training activities. Continue to recruit and train new volunteers. Recognize volunteers at the annual meeting and in the newsletter. Have awards.

Maintenance of community types and their wildlife habitat potential. In order to accomplish the vision for restoration and insure that plant and wildlife communities are protected and enhanced, we suggest that GPMCT institute policies for timber harvest and human use.

Special management areas. We recommend special management areas (Figure 12) in which forestry efforts would be mainly for the purpose of forest restoration and canopy closure. The purpose of these special management areas is mainly to prevent erosion and sedimentation to streams and brooks, and to improve wildlife habitat. We have used the following criteria in establishing these areas:

1. Streams on steep slopes should have buffers of 250 feet on each side. Streams on modest slopes should have buffers of 100 feet on each side,
2. Wetlands are included in the special management areas and should have buffers of 250 feet around the perimeter,
3. Areas at 600 feet elevation or greater should require special management, and
4. The area north of Hothole Pond Trail and west of Valley Road requires special management.

The Maine Department of Environmental Protection offers guidelines for creating a wildlife buffer with a minimum width of undisturbed vegetation of 100 feet on either side of a stream or perimeter of a wetland (Appendix XI). An additional zone of minimum disturbance adds 150 more feet on either side of the stream or wetland (for a total width of 250 feet on either side). We recommend that because the canopy has been removed over many sections of some streams, and buffers have rarely been maintained at GPMW, it is appropriate to set aside 250 foot buffers on all streams on steep slopes and all wetlands including vernal pools. Minimum disturbance might include some light thinning if necessary to address specific problems, but only in winter when the ground is frozen. A 100 foot buffer may be adequate to protect streams on modest slopes. We recommend that, as much as possible, no soil disturbance from machinery and vehicles should occur within the buffers.

Special management considerations for areas at or above 600 feet elevation are warranted as they generally have steep slopes and very thin soil. These areas deserve an additional layer of protection in order to prevent forestry operations from causing further erosion. In addition, the balds found in these areas either currently support or could potentially support smooth sandwort. We suggest that a reasonable approach is to avoid timber harvest in these areas unless there are extenuating circumstances such as pest management.

We recommend special management for the area north of Hothole Pond Trail and west of Valley road because of the potential rich wildlife values found there. Bouldery slopes at the xxxxxxx present many opportunities for dens under dry overhangs of granite rock. The cedar swamp (mostly off the property) in the hollow between Condon Hill and Hothole Hill and associated beaver flowage and vernal pools are also worth special consideration as exceptional wildlife habitat and should be given priority over timber production. Timber harvest may also be difficult in this area because of the many boulders on the slopes. The boulders themselves provide habitat for lichens such as rock tripe.

The total acreage that we propose for special management is 1731 acres. GPMCT would need to decide how best to meet its goal for profitable timber production, given the suggested special management areas. Forestry on the remaining acreage should also be conducted in a more sustainable fashion. The practice of running skid trails perpendicular to the slope (employed over much of the recently harvested forest in the mid to late 1990s) must be discontinued and the skid trail network should be laid out so that erosion is minimized. Operations on any slope should be in the winter when the ground is frozen and if possible, when a crusted layer of deep snow protects soils, tree seedlings and other low vegetation.

Recommendations for ecological reserve areas. GPMCT has considered the potential that up to 30% of the property might be set aside as an ecological reserve. We were invited to recommend a few areas where protection of outstanding wildlife habitat would be the only use. Such an area would be solely for wildlife, with no trails of any kind, no visitor use areas, forest restoration rather than timber harvest, and about which no publicity is offered. Because of the existing road network and the configuration of the two parcels, a true "unpeopled core" may not be possible. We do suggest that Hothole stream, associated wetlands, and the area north of Hothole Pond Trail and West of Valley Road be considered an ecological reserve (Figure 13). While access across the area may continue on the abandoned roads, this would be limited to foot traffic. If Mead Mountain, Hothole Brook and Hothole Pond trails remain unconnected, traffic through the unpeopled core will remain modest. We do not suggest that the area within the reserve be off limits to appropriate uses such as hiking, orienteering, birding and hunting, simply that no formal trails be established in this area. This in itself will discourage persistent traffic and large groups from entering the area and provide a lasting refuge for wildlife. The area north of Hothole Pond trail is particularly valuable for wildlife. A whippoorwill (documented in decline throughout its range) was heard calling in spring 2006 near xxxxxx, and important potential dens are located here. The beaver dam that has led to washout of the road should be left as is, unrepaired, so that vehicles do not go closer to Hothole Pond. The beaver flowage in the southwest corner of Hothole Valley also has a lot of wildlife potential. GPMCT should allow the surrounding slopes to grow back without timber harvest. The small stand of common reed grass should be eradicated or at least contained here. In the Dead River parcel we recommend that Gold Brook and surrounding buffers be protected as the unpeopled core. GPMCT should avoid situating any trail here in this steep-sided ravine area where the current buffer is too narrow to prevent erosion. In the Dead River parcel, the area surrounding Gold Brook would be appropriate as a reserve. While it is not situated in the core of the parcel, it contains some of the largest remaining trees. Forestry operations in the ecological reserves will already be limited if our recommendations for special management areas are undertaken. The total acreage we are proposing for ecological reserves is 838 acres. GPMCT can easily expand any of the suggested reserves in order to meet the 30% objective.

Best ways to bring people on the property. We were asked to prepare recommendations that could minimize impacts on natural resources and reduce potential friction between the various users of the Wildlands. We take the long view and suggest that this involves emphasizing wildlife observation as the principle activity, using the existing road network as the trail system, keeping the gates mostly locked, limiting trails to only a few well-chosen routes that do not compromise stream corridors and the animals that use them, and by not connecting all of the existing trail ends to form loops. Requests for access (e.g., mountain biking) can be regarded in lieu of the number one management goal of GPMCT – natural resource protection, and with the question: how will GPMCT enforce constraints it might set for use? We recommend moving slowly on permitting new uses. Once a use becomes permitted it is nearly impossible to prevent it in the future if it is deemed incompatible with GPMCT goals.

GPMCT will benefit over the long term if there is a strong and vocal constituency of people – local residents and those from elsewhere – who care about the property and want to participate in its care. GPMCT is already doing a good job of bringing the people to the Wildlands in inclusive and appropriate ways. While we have some idea of how past logging has affected the plant communities, we have very little idea of its impact on wildlife. We suggest that the wildlife values are exceptional and will only improve as the forest recovers. Wildlife values should be the emphasis on the property. People will appreciate the educational value of this and most will respect what GPMCT is seeking to accomplish. They can be encouraged to visit especially to observe and appreciate wildlife. By emphasizing the wildlife habitat features of the property, it is understood that not all the animals will be seen on every visit, and that their dens and nests might have to remain out of sight.

People need a place to exercise, and we were glad to see visitors walking in from the locked south gate, where the level ground is conducive to young families with their strollers. We encountered numerous groups of visitors who had small children and were out for a family walk. Multiple uses such as running, bicycling and horseback riding are compatible with hiking, especially if confined to the wider roads.

The gravel pit at the west of Oak Hill offers an opportunity for the visitors to understand some of the dynamics of glaciation. GPMCT might wish to work with scientists at the University of Maine to look at the possibility of becoming part of the newly opened Ice Age Trail of Downeast Maine.

Fishermen and hunters are constituents of the Wildlands. Fishermen can access the property by boat or on foot to visit any pond greater than 10 acres, by the Great Ponds Act. Some visitors apparently come, perhaps by boat, to the mouth of Hothole Brook and camp or have a fire. This is inconsistent with GPMCT policy and should be discouraged. Hunters with permission should be accommodated for the month of November. Hikers, bicyclists and runners should realize that hunters are present except on Sundays. Signs warning hikers to wear orange that were hung in late October 2006 are appropriate and this should continue. However, GPMCT should be prepared that people might not read the notice or understand its implications. In late October, shortly after reading the sign, we talked with a family who were about ¾ mi. in on the Dead River parcel; they had no blaze orange among five people, and were on the wrong trail for their hike up Great Pond Mountain. Hunters should be required to walk in, with no ATVs allowed (as is current policy). Plans should be in place for an emergency, with a list of people to call if the gate must be opened for an ambulance. The hunting policy should be reviewed annually.

The single outhouse at GPMW serves as a landmark for directing people on trails. Hikers probably know to bury their waste deeply, away from any stream. We recommend that an outhouse be provided at Dead River parcel eventually, as hiking and other traffic increases there, and that visitors be encouraged to follow the principles of "Leave No Trace". Educational cards can be provided at the south gate to explain what that is.

One day an unleashed dog rushed up to Dibble aggressively at Dead River parcel. If the owner had not called the dog off, some unfortunate incident might have occurred. This is probably not the type of experience GPMCT wants its visitors to have. Dogs need exercise off their leashes, they like to socialize with other dogs and people. However, nature preserves are not good places for this. If the top priority at the GPMW is natural resources protection and within this, one of the foremost aspects is wildlife habitat, then we question the appropriateness of allowing dogs on the property. We prepared a discussion of the issues and some alternatives that might be considered (Appendix IX).

The road system is ideal for horse-back riding. There appears to be no provision for the removal of horse droppings, which often contain weed seeds. We advise that horse owners should work with GPMCT to identify an appropriate way of tackling this problem. Would they be willing to clean up after their rides? In any case, GPMCT should be vigilant in identifying new weeds that appear along the roads because of horse droppings.

Views and openings. We recommend that the view at the Flag Hill overlook is an ideal place for visitors to enjoy a sweeping view of the east slope of Great Pond Mountain and Hothole Valley. The log landings and roads also offer enjoyable views of the peaks and slopes at Hothole Valley.

The summit areas on the property were heavily impacted by timber harvest. To create additional views would further degrade upland sites unnecessarily and it would be difficult to maintain the openings in a rapidly regenerating forest. Oak Hill and Hedge Hog Hill should be allowed to regenerate without trampling because the lichens growing over bedrock are easily displaced. Unusual plants and fragile lichens must compete with fast-growing early-successional vegetation for many years to come. The summit areas, with the exception of a trail at Flag Hill that is accessed from Happytown Rd (Ellsworth), should be monitored yearly for invasive plants and illegal fire rings or camp sites, but otherwise they should be left undisturbed and without trails.

Existing log landings should be maintained through mowing or brushcutting. They are mostly revegetated and erosion has abated. They are now used by woodcock and other animals, and might be good places to set up bird boxes for purple martin, eastern bluebird, and tree swallow. This would enhance bird habitat (given the paucity of cavity trees in general), and would provide an educational resource and enjoyment for visitors.

A new viewing area could be created at the gravel pit at the foot of Oak Hill at the Valley Road, where erosion control is needed immediately. We recommend that construction of a sediment pond should be considered (Appendix VII) that would alleviate washing of gravels into Hothole Brook. The pond would be a resource for wildlife, and might attract waterfowl, amphibians, and be a water hole for deer and other animals. Wildlife observations at the sediment pond could be part of the glacier park experience if the Ice Age Trail idea is attractive, and has potential as an educational resource.

Boundary issues. Marking the boundaries is an essential step in enforcing use restrictions on the property.

1. The property line at Hell Bottom Swamp in the Dead River parcel is apparently not marked.
2. The boundary at the summit of Hedge Hog Hill is not marked. A gravel pit at the height of land was inappropriately situated. Is this on the property? Watch for erosion problems here. It is revegetating slowly – do not disturb soil further.
3. A walk of all boundaries should be done to fully access this situation

Water level control. The dams on Toddy Pond, and Alamoosook Lake and Dead River (Narramissic River) are under the control of the mill in Bucksport currently owned by Verso. When Champion owned the plant they developed a policy to regulate water levels at the dams. They sought to balance their water needs, those of the camp owners, and those of wildlife specifically nesting loons and lodging beaver and muskrat. That policy (see report by The Conservation Fund) appears to be a sensible one and we suggest that GPMCT use it as a starting point in discussions with Verso on establishing a policy of their own that will be accommodate the needs of wildlife to the extent possible.

Habitat protection for rare plants, animals, or community types

1. Plan for disturbance activities (e.g., small controlled burn) that would retain early-successional habitat for state Endangered swarthy sedge.
2. Do not route any trails or visitor activities through the smooth sandwort habitats, which are easily trampled.
3. Avoid directing visitors where whippoorwill calling/nesting areas can be identified.
4. Strictly limit access to upper elevations that are prone to trampling, especially where the State imperiled Three-toothed Cinquefoil-Blueberry Low Summit Bald community type is present in only a few locations on the property. Education is necessary if any trails traverse this habitat since trail marking is difficult and people are less likely to stay on a trail in an open area where views can be had from many points.

Research needs.

1. Determine the extent to which known vernal pools are used by amphibians. Search for additional vernal pools in mid April 2007.
2. Determine whether American eels are using Hothole Brook and other riparian areas within the GPMW.
3. What is the status of alewives in Hothole Brook and other streams?
4. Continue working to enhance the bird list.
5. Determine which birds of forest interiors might have inadequate habitat at this stage of regrowth in GPMW, e.g., eastern wood peewee, black-throated green warbler, blue-headed vireo, red-eyed vireo, ovenbird, veery. Seek to provide habitat for them where possible by leaving an overstory.
6. Determine which birds need large openings or patches of early-successional forest, e.g., woodcock, chestnut-sided warbler, common yellow-throat; how large an opening is sufficient? How best to manage openings so that nesting birds are not impacted by management activities or visitor use?
7. What are the best designs for bird houses that might enable cavity nesting birds to find a place in the Wildlands? How best to keep predators away?
8. Map all legacy trees and plan around them for timber management.

9. Map the planned stream buffers, those around beaver flowages, and other wetlands. Make sure these are plainly shown on maps used by those conducting timber management on the property.

Long term monitoring plan. To enable volunteers to contribute efficiently and significantly with minimal training, we suggest the following:

1. Decide which committee will have this responsibility. Can that committee handle the monitoring and whatever other duties they already have or is a new committee needed?
2. Establish goals for the monitoring plan. This could include:
    a. Invasive plants – their control and if possible, their eradication; if they are allowed to spread unchecked they will be much more difficult to control later. The best time to work on these is when the plant populations are small.
    b. Sensitive wildlife -- obtain information that would increase the efficacy of wildlife habitat maintenance for protected and sensitive species such as woodcock and whippoorwill
    c. Revegetation of degraded areas – including the Three-toothed Cinquefoil-Blueberry Low Summit Bald on Flag Hill summit – if this is to remain a designated trail, then mark the trail well, put lines of rocks on each side (if possible), and put up small signs ("please stay on trail" and "fragile vegetation"). Clear all evidence of fire pits. Monitor use by using the principles of Limits of Acceptable Change (McCool 1995), in which, for example, the width of a trail is measured in multiple points to follow a potential increase in trampling. Come back periodically and measure at the exact same places. If some threshold for trampling is reached (e.g., the trail was 4 ft wide and after 2 years is 6 ft wide on average), then re-route the trail or close it altogether.
3. Establish a schedule of work party visits to given areas.
4. Recruit and train volunteers; training might be specific to the goals for a given visit, so, someone could help pull seedlings of glossy buckthorn when trained on site.
5. Devise data sheets and decide what their purpose will be, how the data will be summarized and used.
6. Report writing and follow-up. Who will conduct an overview of the monitoring and evaluate it periodically? Where are the successes, what could be done better?

SUGGESTED TWO-YEAR ACTION PLAN

Year One:

Erosion control.

1. Obtain expert advice on erosion control. Take the expert out to the worst sites and write down whatever that person says to do. Read the materials he/she suggests.
2. Identify a volunteer leader within the organization who is willing to commit to 3-5 years with this as his/her top priority and area of concentration.
3. Establish a budget for erosion control, based on the expert's advice.
4. Take baseline photographs of the worst problem areas. Label and catalog these carefully.
5. Conduct silt turbidity tests after 2-3 rain storms as baseline data.
6. Help the leader recruit volunteers as a work force to carry out the recommendations of the expert.
7. Establish a timeline with a series of work parties to carry out the recommendations of the expert.

8. Set up goals for Year Two and start to line up the workers, machinery, materials well in advance.

Invasive plants.

1. Establish goals for the control and eradication of each and every non-native invasive plant known from the Wildlands.
2. Identify a volunteer leader within the organization who is willing to commit to 3-5 years with this as his/her top priority and area of concentration.
3. Equip the leader with a handheld GPS that is capable of working well under a forest canopy.
4. Have the leader use the list provided in this report as a starting place for going back to the areas where invasive plants were found in 2006 but not pulled.
5. Encourage the leader to obtain fact sheets on the invasive plants, many of which are available free on the web.
6. Help the leader recruit volunteers as a work force to carry out the control and eradication activities. How will the volunteers be kept safe in remote parts of the Wildlands, away from the road network? Plan for emergencies.
7. Provide a budget to obtain tools, a weed wrench if that is deemed necessary, gloves for the work parties, plastic bags to put common bull thistle seeds into, etc.
8. Training can take place on site, with the identification of only those plants sought that day, and their treatment, included in the "training". So, no prior experience needed. Be sure to teach the volunteers what not to pull up, too.
9. In November, set goals for the next year and order materials and equipment needed. When all known populations have been dealt with, then go back and check them again yearly.
10. Establish a routine for exploring remote and seldom-visited parts of the Wildlands to check for invasive plants. By this time, a crew of knowledgeable volunteers might have been drawn to this work and could be sent out independently.

Human Use.

1. Encourage wildlife observation as the primary focus of visitor use.
2. Evaluate the dog policy and figure out what is at stake. Consider (1) no dogs, (2) dogs on leash (but not really), or (3) assess support for the idea of working with a group of dog owners to establish a 2-ac dog park near south gate, and have no dogs allowed otherwise.
3. Promote Leave No Trace. Make available at the south gate the plastic cards available as part of the Leave No Trace program. Add this to the maps and brochures.
4. Build up the Erosion Control and Invasive Plant crews by engaging visitors in discussion about the projects, and offer programs about these aspects of Wildlands management.

Year Two:

For both Erosion Control and Invasive Plant Control, proceed based on the work accomplished in Year One. Continue to find new volunteers, and keep the goals clearly in mind. Seek to get the initial project wrapped up by the end of the year, file a report with GPMCT. Set long term goals, write a plan for getting the work done, and evaluate the project.

Conclusion. We found extraordinary bird and plant diversity in the Wildlands, high quality wildlife habitat features, and vulnerable natural communities. In our estimation, problems inherited with the recent timber harvest can be surmounted with persistence and hard work. There is no escaping the expectation on the part of the public that the Wildlands is a park, that GPMCT is the park staff and administration. It could be easiest to work with this misconception by offering park-like support in the form of maps, brochures (as the Trust is already doing), and instructions on Leave No Trace. Some of the regular visitors might be recruited as committed volunteers. In November during white-tail deer season, visitors should be alerted even more prominently to the presence of hunters and be warned in multiple places to wear blaze orange and make noise.

As with the National Park System, the protection of the natural resources cannot be secondary to the demands for public access. GPMCT will benefit by training up volunteers who know their job, and who feel as though they are part of a restoration project, with visible, tangible and measurable results. This inventory is a start toward a full-scale watershed and forest restoration strategy, but the details and directions for that must be developed over time and with the help of many people who care about the Wildlands.

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