

**STEWARDSHIP PLAN 2011-2016
RICE NATURE PRESERVE
WILBRAHAM, MASSACHUSETTS**



Submitted to
The Town of Wilbraham
and
Minnechaug Land Trust

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Purpose

This stewardship plan presents a financially sustainable five year action plan to guide and assist the Town of Wilbraham and the Minnechaug Land Trust in managing the Rice Nature Preserve property in accordance with the established long-term goals of preserving the property and its characteristics for natural resource protection, the future enjoyment of the public, and the benefit of wildlife. In particular, this plan focuses on specific steps to

- Protect the rural character and scenic beauty of the property;
- Preserve the fields for grassland bird habitat;
- Manage invasive and nuisance plants in an environmentally sensitive manner; and
- Enhance public access for passive recreation and nature study.

Introduction and Background

The Town of Wilbraham purchased 140 acres of the former Rice Fruit Farm in 2005 through the cooperative efforts with former landowner Jesse Rice, the Minnechaug Land Trust, and the Commonwealth of Massachusetts Self-Help Program. The property, now known as the Rice Nature Preserve, is controlled and managed by the Wilbraham Conservation Commission with assistance from the Minnechaug Land Trust.

As noted in the Rice Nature Preserve “Land Use and Management Plan” of May 2005 (Minnechaug Land Trust), the property rises high to the east of Main Street and presents spectacular views of the Connecticut River Valley, the Mt Holyoke Range, and

distant hills. The land is part of an important wildlife corridor and is home to several wildlife species threatened by loss of habitat.

Minnechaug Land Trust prepared the first management plan for the property in 2005. In that year, the Town secured a federal WHIP (Wildlife Habitat Improvement Program) grant through the Natural Resource Conservation Services office in Hadley, and with help from that grant and from volunteers has engaged in active stewardship of the property since its purchase. The joint effort has included trail construction and signage; the placement of an entrance kiosk, benches, a plaque recognizing donors, and bird nest boxes; invasive plant control, the conducting of thorough inventories of plants and birds, significant efforts to control invasive plant species, placement of raised bog bridges through wet sections of trail, cleanup of trash, and regular tractor mowing of the fields.

The plan also listed future tasks to promote the public use of the property, including the creation of self-guided nature trails with brochures available to the public, development of a sustainable forest management plan, and creation of off-road parking at Highmoor Drive (which has since been taken off the list).



The stream ravine and young woods on the Rice Nature Preserve property where the Brookside Trail is located.



Under Town of Wilbraham ownership since 2005, the Rice Nature Preserve now has a well-maintained trail system that starts at the east end of Highmoor Drive.



The view west across the Valley from the upper part of the south field.

The current plan follows the 2005 document by addressing the next round of future stewardship concerns and the following questions posed by the Town:

- How should the old peach orchard be managed?
- How can the present fields best be kept in open condition for their spectacular views and for wildlife habitat purposes?
- Would a forest management program with an eye to generating future revenue from wood sales be advisable?
- How can the bridge over the ravine best be replaced to connect the two main fields for foot and possibly tractor access?
- How can the farm roads best be maintained to prevent erosion and allow continued vehicle access to the fields?
- Will continued liming of the fields be advisable?
- How can future management efforts be funded?
- How can invasive species be effectively controlled?

This plan also focuses on boundary location and marking, future trail development, maintenance and improvement of bird nest boxes, land use issues shared with the principal abutting landowner, the encouragement and regulation of public use, funding land management into the future, and regular monitoring of the property.

Context of this Report

The Town and Minnechaug Land Trust (MLT) have put a great deal of thought and effort into the first five years of ownership and management of the Rice Nature Preserve. Volunteers and Land Trust members have built trails, installed a beautiful entrance kiosk, constructed and upgraded boardwalks over wet areas, installed benches and a memorial plaque, kept the fields mowed, carried out inventories of plants and birds on the property, and grappled with the control of invasive plants on and adjacent to fields and trails with the help of Chris Polatin, contractor.

The present plan recommends ways to follow that initial five-year period with constructive measures that will improve the fields, trails, boundaries, and invasive plant situation over the next five to ten years. We discuss the progress made by the Town and MLT under the ten-year, 2005-2014, federal WHIP grant awarded to improve habitat in the main fields, and we suggest follow-up steps and the possibility of future grants. We include a chart showing the approximate funds that will be needed to manage the Preserve over the period 2011-2015.

We drew up the present plan after the following:

- Numerous discussions with Planning Director John Pearsall, MLT Representative Kate Leary, NRCS/USDA staff members, land trust volunteers, and experts on various types of land management and invasive plant control between July and December 2010.
- Meeting of the MLT Rice Stewardship Committee on Oct 20, 2010.
- Meeting with abutter Dr. Rob Matthews and Planning Director John Pearsall on Nov 12, 2010.
- Meeting of the Minnechaug Land Trust directors on Dec 13, 2010.
- Site visits on July 26, Sept 28, Oct 9, Oct 11, Oct 13, Dec 7, and Dec 14, 2010.

As of January 2011 we are also nearing completion of a Baseline Documentation Report for the Preserve that will assist with future monitoring efforts and meet legal requirements associated with open space land ownership and management.

Executive Summary of Five-Year Action Recommendations

1. Clear most of the peach trees from the old peach orchard. Leave a few trees along the upper southern edge for historical purposes.
2. Include the old peach orchard in the twice-annual tractor mowing schedule.
3. Tractor mow all of the two main fields and old peach orchard twice each year, preferably before April 15 or around July 15 and again around September 15 to help keep woody plants and invasives under better control.

4. Carry out continued invasive control measures along the upper Rachel Phelps Trail and in and around the edges of the fields.
5. Monitor the property every year to be sure new invasives like porcelainberry or black swallowwort do not appear and gain a foothold.
6. Hand-clear oriental bittersweet and poison ivy from the large rock in the lower part of the north field.
7. Leave the small overgrown field at the junction of the Rachel Phelps and Underpeak Trails to grow up into woods. Clearing it would be an expensive chore and a losing battle. Multiflora rose control around the edges, especially along the two trails, will help keep the rose from spreading beyond the site.
8. Apply lime to the north field in 2012 with \$505 still available for that purpose in the WHIP grant, provided that is proves practicable to get the lime to the site, and provided the Town has supplementary funds to cover the total cost.
9. Move trails that cross the main fields to the perimeter of the fields.
10. Replace the small, broken sections of footbridge on the upper Highmoor Trail.
11. Install water bars to Appalachian Mountain Club standards on the Rachel Phelps Trail to prevent erosion of the trail tread.
12. Conduct regular mowing of perimeter field trails to a width of 4 or 5 feet several times a year.
13. Clear some of the staghorn sumac patch at the top of the south field to prevent it from spreading out into the field.
14. Clear a new loop trail from the Rachel Phelps Trail down across the lower part of the old peach orchard and over to connect with Brookside Trail.
15. Build a new footbridge (on the old footings) over the stream in the main ravine to connect Brookside Trail with the middle part of the north field.
16. Evaluate the possibility of enlarging the scale of the above proposed bridge to accommodate a tractor mower so a tractor could travel from the north field to the south field without descending to the Matthews property.
17. Clear a new trail from the upper Weshaugan Trail to the Old Cabin site.
18. Locate boundaries and carry out boundary marking with small aluminum signs, especially on portions of the boundary that meet residential properties.
19. Post "Leaving Rice Nature Preserve – No Trespassing Beyond this Point" signs at locations where walkers are tempted to enter the adjacent Matthews peach farm property.
20. Post caution signs that list seasonal hunting dates at the main entrance.
21. Conduct regular maintenance of trails and bog bridging. Future bog bridging could make use of trex or other materials other than untreated lumber.
22. Work with adjacent owner Robert Matthews to repair the steep, eroded portion of the farm road (at the sharp curve) that leads up to the north field with new gravel and one or two graded water bars.
23. Post signs indicating that dogs are prohibited from the property during the most active nesting season (April 15 through July 15). This is a recommendation that will need ratification by the Town and Land Trust if it is to go into effect.

24. Install kestrel boxes on 18-foot poles near the middle of each of the two main fields (one box in each field).
25. Remove the few remaining trees from the south field to improve the likelihood that the fields will attract grassland birds. (This is a question of priority, inasmuch as removing the trees will eliminate perches for bluebirds and other species but will render the field more likely to attract grassland species.)
26. Carry out regular pre-spring cleanings of the bluebird boxes that are already in the main fields.
27. Investigate possible trail expansion onto adjacent properties with links to Town of Wilbraham properties along Big Brook.
28. Cooperate with abutter Robert Matthews to inform neighborhood and other town users of the two properties about regulations and expectations for public use.
29. Maintain communication with adjacent landowners and others in the neighborhood to be sure they have no current un-addressed issues relating to the RNP and to be sure they understand ongoing projects and plans for the Reserve. Occasional public meetings open to neighbors could help acquaint folks with Rice plans, projects, regulations, and expectations, and could help with fundraising for the Preserve.
30. Look into the possibility of a 2nd WHIP grant (after 2014) for invasive plant control around the edges of the fields and/or an EQIP grant for peach orchard removal and rehabilitation. Either of those would be possible only if Minnechaug Land Trust proves eligible and submits the application, as towns no longer qualify for either program.
31. Continue plant and bird monitoring and listing on the property.
32. Conduct wood turtle monitoring along the stream banks in March and April when the night temperature is below freezing and the day temperature is above freezing.

Management Funds - Budget

The following is a suggested 5-year budget for management and monitoring of the Rice Nature Preserve:

| <u>Item</u> | <u>2011</u> | <u>2012</u> | <u>2013</u> | <u>2014</u> | <u>2015</u> |
|--|----------------------------|----------------------|----------------------------|--------------|--------------|
| Tractor mowing of main fields and peach orchard* | (1,410 WHIP) 2,500 Town | 3,500 Town | (1,410 WHIP) 3,000 Town | 3,500 Town | 3,500 Tn |
| Removal of old peach trees and establishment of new cover | 1,500 | 0 | 0 | 0 | 0 |
| Liming of north field | 0 | 505 WHIP 505 Town | 0 | 0 | 0 |
| Boardwalk replacement and repair | Volunteers | 0 | 0 | 0 | 500 |
| Bridge construction** | 0 | 500 | 0 | 0 | 0 |
| Invasive plant control (2 days of contract work) | 3,000 | Volunteers | 3,000 | Volunteers | 3,000 |
| Kestrel box installation | 200 | ---- | ---- | ---- | ---- |
| Trail maintenance and trail mowing | Volunteers | Volunteers | Volunteers | Volunteers | Vol'trs |
| New trail construction | Volunteers | ---- | ---- | ---- | ---- |
| Removal of old barrels | Volunteers | Volunteers | ---- | ---- | ---- |
| Gravel and grading of farm Road on Matthews property (to be cost-shared with Matthews) | 400 | 0 | 0 | 0 | 0 |
| Total non-grant funds needed | 7,600 | 5,010 | 6,000 | 3,500 | 7,000 |
| <u>Potential Funds Available</u> | | | | | |
| Minnechaug funds left from 2010 | 500 | 0 | 0 | 0 | 0 |
| Remaining Jesse Rice funds | 1,250 | ---- | ---- | ---- | ---- |
| Benefit road race*** | 1,000 | 2,000 | 2,000 | 2,000 | 2,000 |
| Donations via MLT appeal | 1,000 | 1,000 | 1,000 | 1,000 | 1,000 |
| Proposed Town funds from CPA or other sources | 3,850 | 2,010 | 3,000 | 500 | 4,000 |

*Note: this is an estimated cost; one tractor mowing for improvement of the two main fields plus the old peach orchard in 2010 cost \$1,700, but we anticipate that the cost will rise gradually over coming years as fuel costs go up. For planning purposes, we place the total cost of two annual mowings at \$3,500. **Bridge construction materials will cost approximately \$500 for a 4 ft x 24 ft footbridge, approximately \$5,000 for a 10 ft x 24 ft tractor bridge. Construction work will be done by volunteers.

***Road race proceeds are approximate. They could be higher than the above estimate depending on the amount of publicity and volunteer help that goes into the event.

Previous Management, the 2005 Management Plan, and the WHIP Grant

Minnechaug Land Trust provided the first management plan for the Rice Nature Preserve, dated May 23, 2005. The plan details the various uses to be expected on the property and lists initial and future tasks to be done under the plan. The following is the status of each item proposed:

- Trail development and maintenance. Previously existing trails have been marked and maintained, and some connector trails have been established.
- Signage. Signs identifying the property have been installed in a few places. Signs have yet to be placed along the perimeter of the boundary with adjacent land.
- Map. A trail map is exhibited at the entrance kiosk and copies may be picked up from the kiosk trail box.
- Kiosk. A new kiosk is in place just off the cul-de-sac of Highmoor Drive.
- Plaque. A bronze plaque recognizing donors has been mounted at the main trail entrance at Highmoor Drive.
- Invasive plants. Work has been done, largely through the 2005-2015 WHIP grant, to control invasives in and on the edges of the main fields and along some of the trails.
- Natural resource inventory. Inventories of plants and birds have been conducted for the property.
- Environmental education. The Town and Minnechaug Land Trust have encouraged environmental education groups to use the RNP as an outdoor classroom.
- Organized hikes. Several organized hikes through the RNP have taken place to date.
- Nature trails. Self-guiding trails have not yet been established for the property.
- Forestry management plan. The plan recommended that a sustainable stewardship plan be developed for the long-range forest management of the property, with no logging during bird nesting season (April 15 – August 15). No action has been taken yet on this matter.
- Field maintenance. The upper north and south meadows have been mowed once a year.
- Access and parking lot maintenance. Inspection and maintenance tasks have been carried out regularly.

- Trails. Various volunteers have helped with trail clearing and maintenance and with the construction of sections of bridging over wet parts of the Highmoor Trail.
- Monitoring. The Minnechaug Land Trust has been monitoring the property regularly.

There are now 4 years of funding (2011-2014) left in the 10-year federal WHIP (Wildlife Habitat Incentives Program) grant awarded to the Town in 2005 for the management of the main fields. The purpose of the grant was to carry out brush management, invasive plant control, and establishment of conservation cover on the fields.

From 2005 through 2010, WHIP funds were used for herbicide spraying of the fields and edges. Garlon 4 was applied in 2006 to attempt to control the poison ivy, oriental bittersweet, multiflora rose, Japanese barberry, and autumn olive. On Oct 18, 2006, Robert E.W.Collins of REWS Land Management, the contractor for this part of the project, noted “I cannot explain why the previous chemical (Garlon 4) did not control the invasive area ...” and suggested spring and fall foliar spraying with Crossbow, a Garlon 4 formula, for the 2007 growing season. The results have been less than satisfactory, as the fields still contain abundant poison ivy and other invasives, which I believe have been encouraged by the practice of tractor mowing only once a year. A 2007 NRCS field note states “Verified poor results of invasive spray by REWC two weeks ago. The broadleaf invasives showed no sign of being affected.”

Note: Chris Polatin (Polatin Ecological Services) conducted additional invasive plant management activities on one day in 2009. He used Garlon 4 on a 50-foot perimeter along the Rachel Phelps Trail. The applications, with motorized backpack sprayers, took place in July and August 2009, and the bill was \$1,500. He had planned to perform follow-up operations in 2010 and hoped for 95% or better invasive plant control as a result of the two years of work.

Here is Chris Polatin’s description of work done in 2009:

“Oct 22 we foliar sprayed invasive shrubs such as multiflora rose, bush honeysuckle, and Asiatic bittersweet with a 2% solution (v/v) of Garlon 3A (active ingredient = triclopyr) mixed with surfactant and water. The application was done along the perimeter of the northernmost field. We also foliar sprayed 15+ multiflora rose shrubs within the vicinity of Old Farm Road and the Brookside Trail. Nov 16 we cut mostly common buckthorn and treated the cut stems or stumps with a mixture of Garlon 4 (20%) and basal oil. We also treated honeysuckle and olive shrubs. The work was done along the east side of Brookside Trail all the way up to the southern field where the Weshaugan Trail is located. We left cut stems on the ground to decompose. Some of the larger buckthorn trees were left standing and were treated with an approach called “girdle and squirt.” Future work – we will spend 1-1/2 more days in 2010 for follow-up treatments to the areas described above. We will also plan to work within the vicinity of the Phelps Trail or any other areas you might suggest.”

Here is his December 2010 description of work done to date:

“We completed 1 day of work in 2010 with our four member *Habitat Restoration Team* along the Rachel Phelps Trail. We cut dense bittersweet vines and treated the cut stems or stumps with a mixture of Garlon 4 Ultra (20%) mixed with methylated seed oil. We are budgeted for one more half day of work. I had anticipated using this time to follow-up on the work we did in 2009. Unfortunately there wasn’t time this season to do this by the time permission was granted by the new adjacent owners.”

The following amounts are still available for the remaining years of the WHIP grant:

| | <u>2011</u> | <u>2012</u> | <u>2013</u> | <u>2015</u> |
|----------------------|-------------|-------------|-------------|-------------|
| Lime Application | | \$505 | | |
| Mowing/Brush Hogging | \$1,410 | | \$1,410 | |

After the current WHIP grant expires in 2014, it may be possible to secure a second WHIP grant to concentrate on invasive plant removal from the edges of the fields, but because towns are no longer eligible for the WHIP program, Minnechaug Land Trust would have to show the NRCS office that it had a significant management role in the property. It may also be possible to secure a 2011 federal EQIP grant, also through NRCS, for peach orchard tree removal and orchard rehabilitation (removal of trees and stumps, re-grading of the orchard, and establishing a cover crop). The same eligibility requirements would apply, necessitating a legal management role for Minnechaug Land Trust. Application deadlines for upcoming EQIP rounds are January 15 and May 15.

As to the proposed lime applications, the original plan under the WHIP grant was to apply lime in 2009 and 2012 to assist with the success of the timothy/orchard grass mix that was to be applied by no-till seeding and to help discourage the poison ivy and multiflora rose. On April 1, 2008, Gene Kosinski of NRCS wrote to John Pearsall, “I know that the application of lime has been an issue since the cost seems to be more than the Town cares to justify. If we could do the seeding I can apportion a percentage of the seeding funds to account for the lime application which should augment the original funds and come close to pay for the entire cost.” An NRCS note of Nov 20, 2008, states that the seeding amount was switched to pay for “upland management” to mirror an agreed-upon contract modification.

Lime applications on the north field alone would probably assist with efforts to control the poison ivy and goldenrod there, but the Town’s share of the lime cost (together with \$505 from the WHIP grant) may be more than it chooses to afford. A pH of 6.5 or greater would probably be a realistic goal, recognizing that the pH would probably go back down once lime treatments end.

NRCS staff notes from early 2010 include the following January 28 comment: “John

Pearsall ... states that foliar spray was not completed (in 2009) because field was not mown until the end of September and liming was not completed due to the cost.”

The Old Peach Orchard



The old peach orchard seen in December 2010, just after a tractor mowing. A proposed trail through the lower part of the orchard would run across the portion shown above.

The old peach orchard has not been managed for peach production for several years, and many of the trees are decaying. The orchard is also growing a vigorous crop of multiflora rose, poison ivy, and oriental bittersweet along with dense stands of goldenrod, common milkweed, cow vetch, blackberry, and Virginia creeper. The edges have considerable multiflora rose and blackberry.

There are two reasons why we recommend that most of the peach trees be removed:

1. Unless it is in production, the orchard will quickly fill with invasives, especially vines that will climb over the peach trees. Removing the trees and stumps will allow regular tractor mowing to keep vegetation under control.
2. Unless they are sprayed, the trees will gradually be infected by various disease and insect problems that could spread to adjacent production peach orchards on the lower Rice (now Robert Matthews) property.

Some of the trees along the upper margin of the orchard could be left uncut for historical purposes. Those should be kept free of poison ivy and other climbing vines by regular hand-trimming.

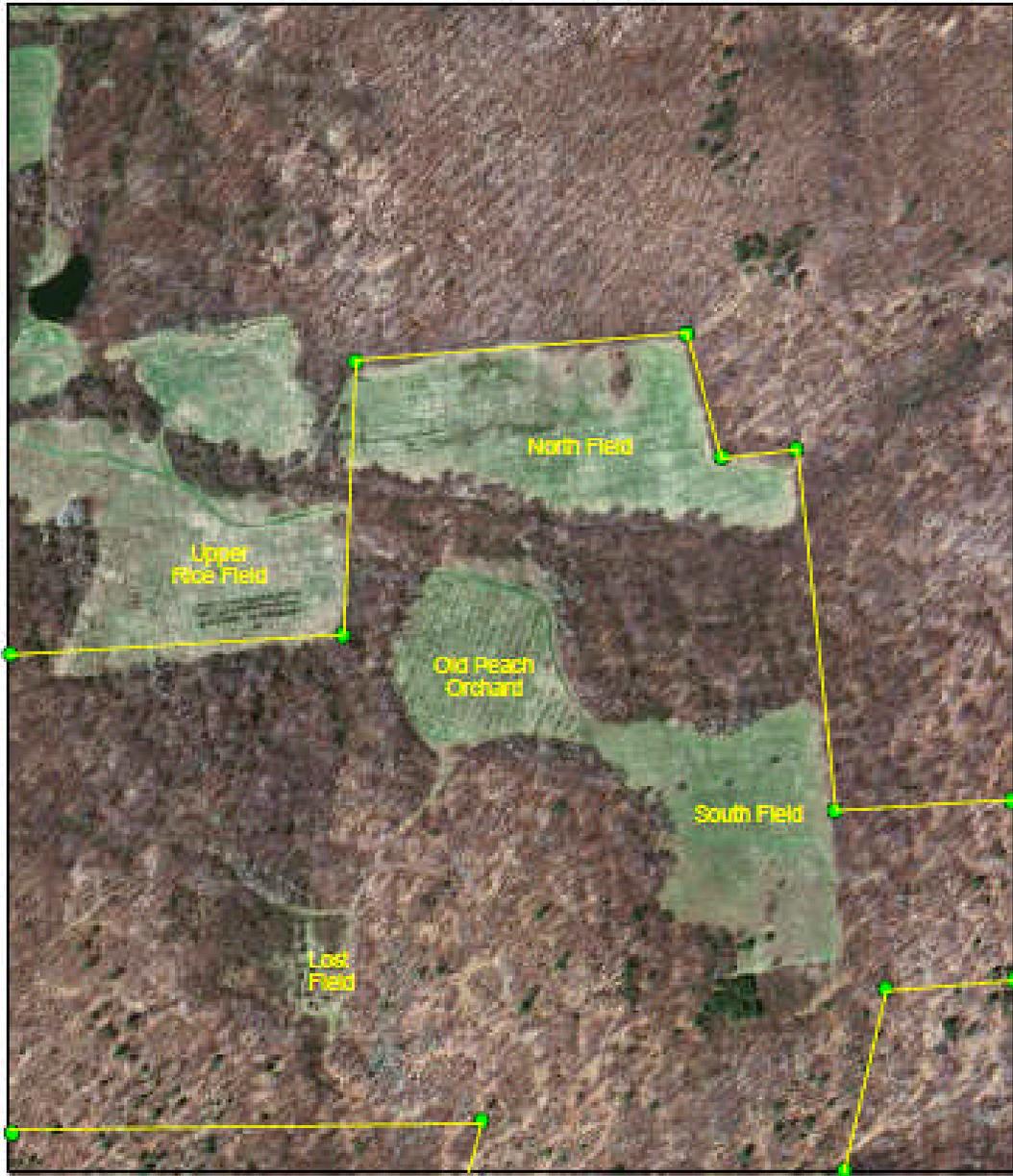
At its Oct 20, 2010, meeting, the Rice Stewardship Committee agreed to a winter 2010-11 peach tree removal project. The trees will be cut with chain saws and the stumps will be ground down. The wood debris will be piled at the lower, north side of the orchard where there is already a wood and brush pile. The pile should not be burned because of the risk of poison ivy contamination of the smoke.

In future years, the orchard, along with the north and south field, should be mowed twice annually to keep ahead of invasives and minimize additional encroachment by goldenrods and native woody plants. Periodic invasive control measures should be employed around the edge of the orchard to keep multiflora rose and Asiatic bittersweet from dominating the perimeter vegetation complex. As mentioned above, there is an outside possibility that Minnechaug Land Trust could qualify for an EQIP grant to destump the old orchard after the trees are gone and to establish a cover crop. The EQIP grant would tentatively cover about half of the \$3,000/acre cost of the work.

The Main Fields

The goal of the Town and the Minnechaug Land Trust is to keep the fields open as grassland wildlife habitat, scenery, and walking trails with spectacular open views down to the valley to the west and up to nearby hills. The fields are marginally big enough to support nesting grassland birds, and savannah sparrow, song sparrow, and redwinged blackbird pairs have nested there in the past. Five acres can be large enough to support bobolinks or savannah sparrows, with eastern meadowlark a less likely possibility. The two fields together are more likely to attract grassland nesters than one field alone, although fields surrounded by woods are poorer attractions for those species than fields in a larger agricultural setting.

Both fields probably have low soil fertility because they haven't been farmed in some time. Soil tests taken in September 2010 showed a pH of 6.2 for the north field, 6.0 for the south field. The north field is in more overgrown condition, with an abundance of poison ivy, oriental bittersweet, and multiflora rose as well as significant patches of goldenrod and bull thistle. Those species all render a field less likely to attract grassland nesting birds. Multiple mowings (at least two) each year will help lower the aggressiveness and seed-spreading potential of those species, but will not eliminate them. Mowing and removing the stubble for hay would help the grasses outcompete the forbs on the fields, but unless the fields were to be plowed and re-seeded (see item #3 below), it will probably not be possible to find someone who would want the ivy- and weed-filled hay.



Rice Nature Preserve Fields Detail

0 150 300 600 Feet



Mass GIS February 2010



The south edge of the main north field. The stream ravine and Brookside Trail are just to the right of the field.

Realistically, there are three potential ways of keeping the fields as open and free of invasives as possible:

1. (Recommended) Brush-hog mowing of the fields at least twice a year. Ideally, that will keep the non-native woody invasives that are already established from sprouting as vigorously and will keep some of them from going to fruit or seed. It will also keep the poison ivy to a manageable height so those who walk on mowed trails through or next to the fields are less likely to come into contact with it. Multiple mowings will not get rid of the poison ivy or invasives, but will render them somewhat less vigorous and can be done within a realistic budget framework for the Town. Because mowing during the nesting season for grassland birds can destroy nests and nestlings, mowing should be done before April 15 or after July 15 and again in September. (It might be possible to mow in June or early July if a thorough inspection shows no grassland nesting activity in that given year.)
2. (Not recommended) Continued broadcast applications of foliar herbicides in an effort to get rid of most of the non-native invasives and the poison ivy. This has the disadvantage of introducing a significant herbicide load into the Rice system,

and because the poison ivy and invasives are so well established and so vigorous this has not been effective in the past. Because herbicide applications have had limited effect, it has not been possible to carry out no-till re-seeding of the fields to a desirable grass mix.

3. (Not recommended) Plowing, re-seeding, and subsequent annual mowing of the fields. Plowing would run the risk of erosion of the fairly steep slopes found on these fields and would necessitate soil testing to be sure that chemicals such as lead and arsenic that were undoubtedly applied to the peach orchard in the 1950's and 1960's before they were banned would not be brought to the surface. It may be an option for 5 or 10 years down the road if the Town wants to start the field again with a new crop and feels it can take on the challenges presented by erodible slopes and possibly contaminated ground.

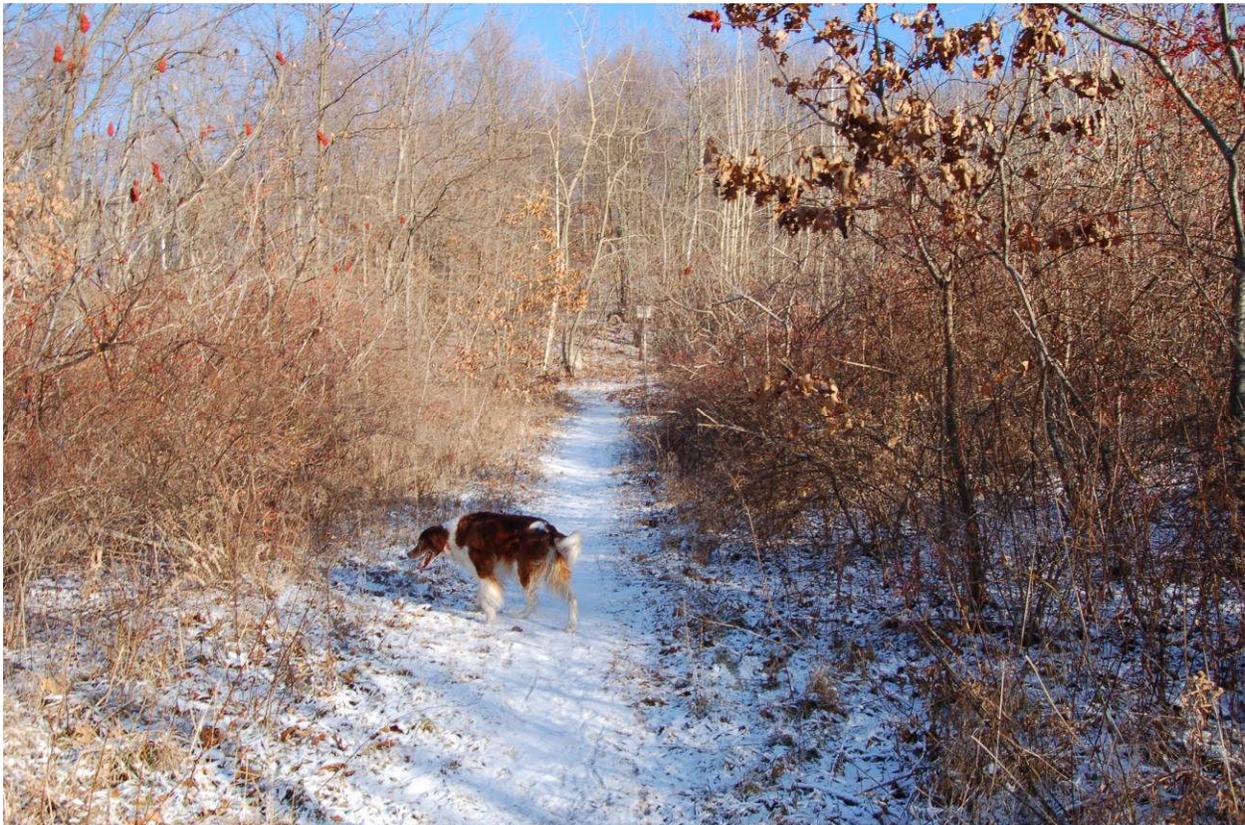
Liming the north field once in 2012, using the \$505 in available WHIP funds supplemented by Town or Land Trust funds, might make sense if it proves practicable to get the lime to the site for a reasonable cost.



The Rachel Phelps Trail cuts across the south field on the way up to the memorial bench at the high point. Regular mowing of the trail will make it more usable throughout the summer. Other trails will be moved to the perimeter of the fields.

The Small Abandoned Field at the Junction of the Phelps and Underpeak Trails

The small overgrown field (see photos below and page 30) at the junction of the Rachel Phelps Trail and the Underpeak Trail is full of multiflora rose, blackberry, and oriental bittersweet. Ideally, the field could be cleared and regularly mowed, but the tangle of shrubs and vines is well enough advanced that clearing it would be a formidable job. The land trust has mentioned its concern that the abundant rose and other fruit-producers would serve as a source of seed that would be spread by birds to the old peach orchard. Realistically, there is already abundant seed source around the edge of the peach orchard, and eliminating those plants from the abandoned field would probably do little to lessen the likelihood that they will try to spread throughout the orchard once it is cleared of trees. It would be advisable to cut and basal spray the rose plants nearest to the trails so they don't overrun the paths. That could be accomplished as part of an annual contract invasive-removal project to be carried out by Chris Polatin or other qualified specialist.



The Phelps Trail where it passes between the small abandoned field (right) and patches of multiflora rose on the left. Control of those plants in this area will be helpful.

Invasive Plant Control



Oriental bittersweet vines seen climbing trees at the woods edge on the north side of the main south field in July 2010. Limited work has been done to control these and other invasives found around the field edges.

As discussed above, non-native invasive species on the Rice Preserve include multiflora rose, Asiatic bittersweet, autumn olive, Japanese barberry, glossy buckthorn, common buckthorn, and others. The multiple mowings recommended above will help keep these species under a modest level of control in the main fields. Around the edges of the fields and along some of the trails, it will be important to keep invasives from spreading into the trails themselves. Cutting and treating the cut stems with herbicide is a practical way of controlling invasives along trail corridors. The budget above proposes \$3,000 a year for two days of contract spot control of invasives in each of the years 2011, 2013, and 2015.

Few invasives were evident in the closed woods of the RNP, but occasional volunteer woods-inspection and control days could help head off the expansion of species like Japanese barberry, garlic mustard, and glossy buckthorn. The entire property should be monitored regularly to be sure new invasives like mile-a-minute vine, black or pale swallowwort, or porcelain-berry do not show up. The latter two are already present in western Mass, and other exotics typical of areas south of Massachusetts are likely to appear as the climate warms.

Access, Boundaries, and Signs

Principal foot access to the property is by way of the main trailhead at the end of Highmoor Drive. There is room for 6 to 8 vehicles on the cul-de-sac circle, and the 2005 plan recommends building permanent off-road parking on adjacent Town-owned land, subject to environmental approval. Trail access is also available from Peak Road and the Sunrise Conservation Area via Sunrise Trail.



The kiosk, map box, and bog bridging at the Highmoor Drive trailhead. Volunteers built the new bridging in late 2010.

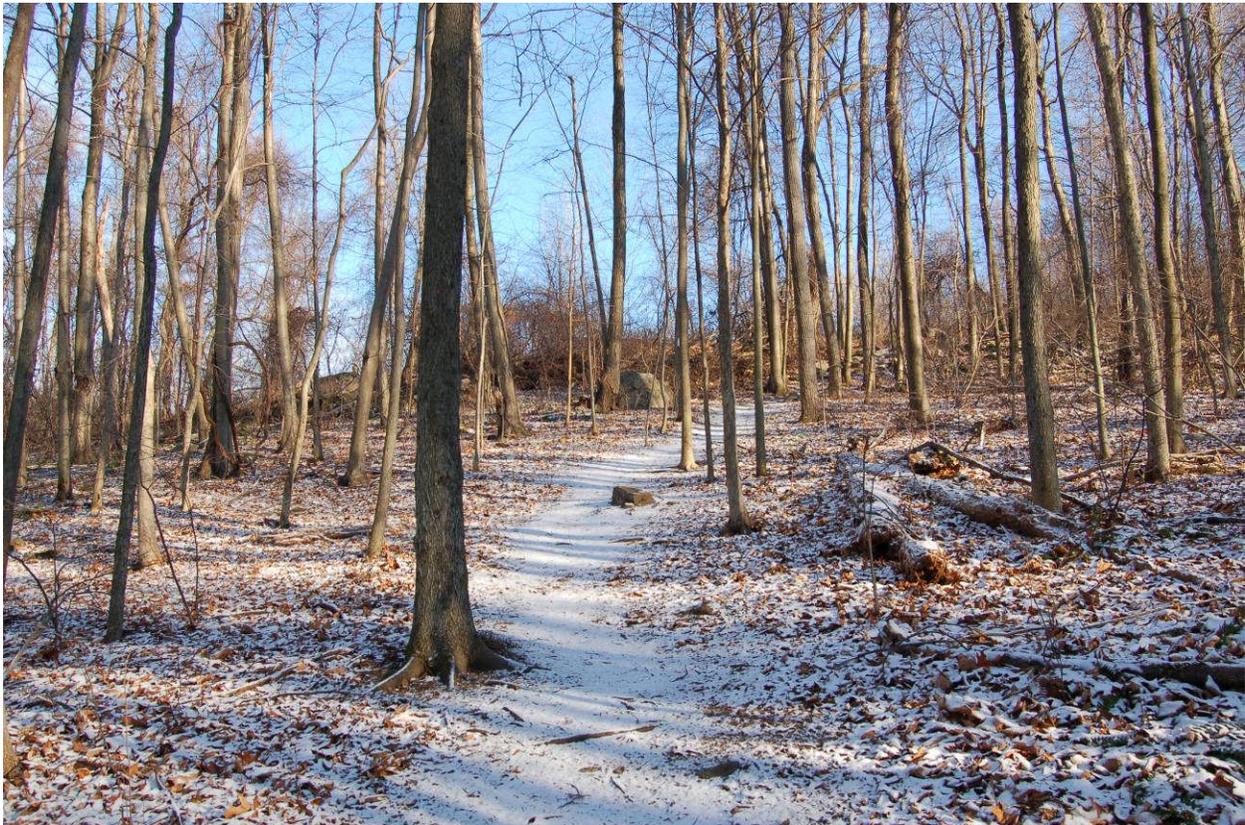
The present main trailhead at Highmoor Drive is attractive and inviting, with sturdy sign and kiosk structures. There is also a Rice Nature Preserve sign on the Old Farm Road where it enters the property from the Matthews peach farm. The Town might want to consider installing an additional entrance sign at the east end of Sunrise Trail, at Peak Road. The new bridging (photo above) was completed thanks to donated time and expertise by Gary Roberts, Jeff Smith and friends, and Charlotte Lawson's Trailblazers. The 2005 management plan proposed off-road parking in the vicinity of the cul-de-sac, but permits for that parking have proven to be unavailable.

Tractor access to the main fields is available by permission of Robert Matthews by farm

roads that start at (1) Main Street and (2) Tinkham Road and pass through the Matthews peach orchards.

Boundaries have generally not been marked. Some of the iron corner pins have been located and flagged. The boundaries should be carefully located (by survey if funds allow) and marked with aluminum boundary signs for future use in checking for boundary incursions and alerting abutters to the exact boundary location.

Trails



The Highmoor Trail below the south Matthews field, which is just beyond the woods in this photo. The Rice property boundary is about 100 feet to the left of the trail, out of the photo.

The Rice trail system takes walkers to almost every part of the preserve. Early December 2010 discussions with Matthew Fraser and Kate Leary focused on a plan to develop the following additions in 2011:

- (1) A new path from the Rachel Phelps Trail through the lower part of the old peach orchard and over to the Old Farm Road and Brookside Trail
- (2) Construction of a new footbridge across the brook where an old mounded

Rice Nature Preserve

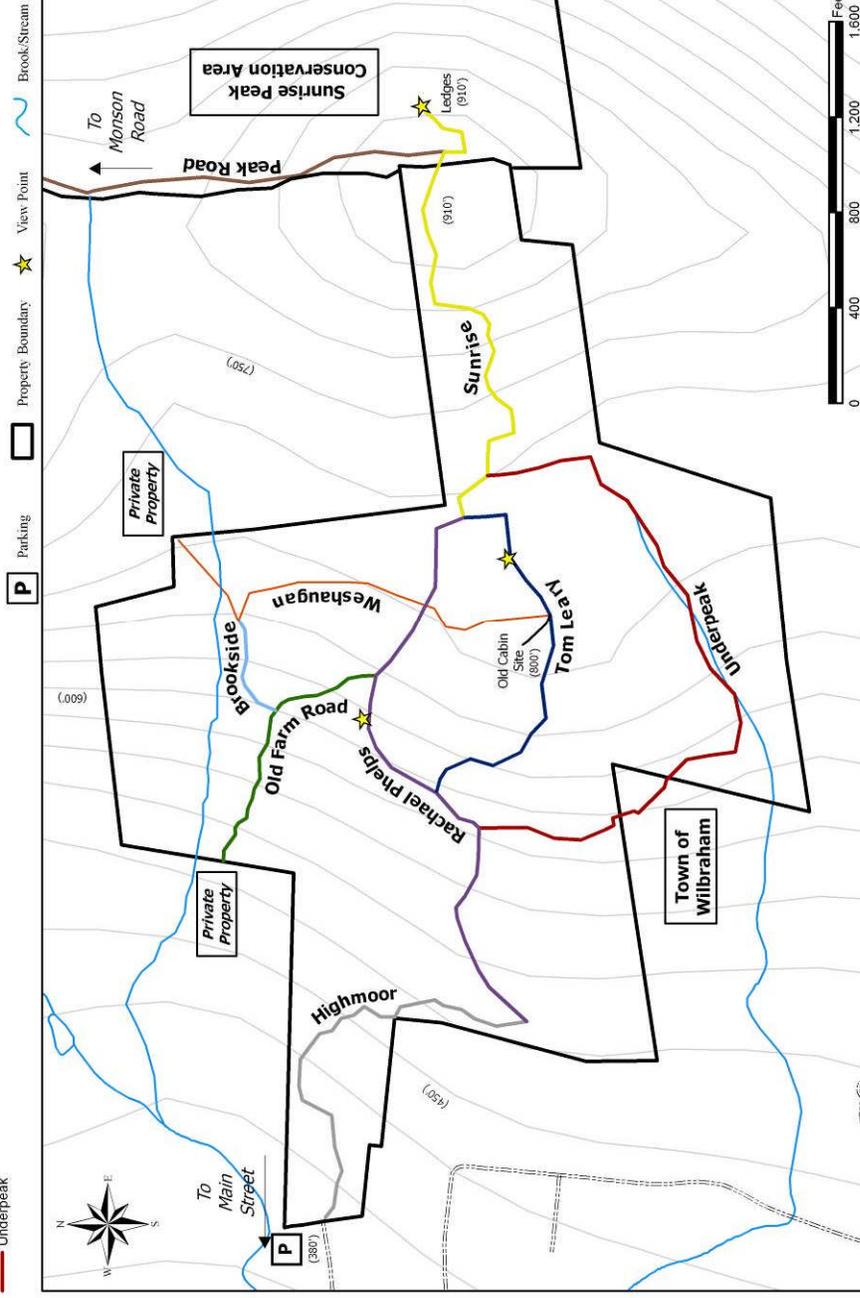
Trail Map

-  Tom Leary
-  Rachael Phelps
-  Highmoor
-  Underpeak
-  Sunrise
-  Brookside
-  Weshaugan
-  Old Farm Road
-  Peak Road

The Rice Nature Preserve is available to the public for passive conservation and recreation purposes. These include: hiking, cross country skiing, snowshoeing, educational studies, and nature observation.

The trail system (approx. 3.4 miles) is marked with rectangular blazes and may be rough in some spots. Sturdy footwear is advised. Please limit use of trails under wet conditions to minimize erosion.

LEAVE NO TRACE. Leave only footprints. If you are not planning to reuse this map, please return it to the map box.



PROPOSED RELOCATION FOR WESHAUGAN TRAIL (courtesy of Matt Fraser)



1. The trail will begin in south end of the peach block where the Rachael Phelps trail exits the wooded area as seen on the left side of the map.
2. The trail makes its way across the peach block then crosses the old farm road and continues northeast towards the brook. Once approved, a foot bridge will be constructed over the brook allowing easy passage into the north field.
3. As the trail emerges into the field it will take a left and head northwest with a great view of the pioneer valley. The trail will then sweep to the north and head towards the rock outcropping in the lower part of the field.
4. The trail will then sweep to the east heading back up the mountain along the perimeter of the field. It will follow the perimeter all the way up to the extreme northeast corner of the field.
5. At this point, the trail will follow the original trail route southwest back across the field into the wood line and back up to the south field (orange blazes). When the trail emerges into the field it will turn left and sweep back up the hill following the wood line (staying clear of the birdhouses) where it will end at the junction of the Rachael Phelps, Tom Leary and Sunrise trails.

base is already in place, connecting to

- (3) A mowed path around the perimeter of the north field;
- (4) Relocation of the lower part of the Weshaugan Trail so it follows the edge of the south field; and
- (5) Construction of a new path, possibly to be called Old Cabin Trail, from the upper Weshaugan Trail to the Old Cabin Site.

Matt offered to build the proposed footbridge over the main stream and offers to use his own mowing equipment to keep the field trails mowed in the summer to a width of 4 or 5 feet. Ideally, trails should follow the perimeter of the fields to avoid the periodic nesting activity that takes place farther from the edges of the field. Savannah sparrows, song sparrows, and red-winged blackbirds have nested in the grass at the RNP, and bobolinks are possible though unlikely because of the small size of the fields.

Bridge materials: Future bridge decking should employ trex (a durable plastic-wood composite material) or its equivalent or pressure-treated lumber rather than untreated wood. Untreated material will decay quickly in a damp, wooded setting, necessitating early replacement and disposal of the rotted wood material, both labor-intensive chores. Since about 2002, pressure-treated wood has been treated with copper-based rather than arsenic-based preservatives and are thus considerably safer and more environmentally friendly. Care should still be taken not to inhale the dust from any materials, even untreated wood, during construction projects.



New bridging on the Highmoor Trail.

Nest Boxes

Regular inspection and repairs to the many bluebird nest boxes on the Rice fields will be important so as to keep them clean and dry for the birds and attractive to passers-by as examples of good box construction and maintenance. Annual box cleanings should be done in February or March to empty them of old nest material, debris, mice, and wasp nests. Although eastern bluebird populations have rebounded significantly over the past 20 years, thanks largely to nest boxes placed on fields like these, the boxes can still be valuable in attracting bluebirds, house wrens, and tree swallows to locations where they can be easily viewed by walkers.



Two of the many bluebird nest boxes that have been installed in the main fields. This view is of the north field looking south toward the stream ravine.

American kestrel boxes can be important in maintaining dwindling kestrel populations in this region. One kestrel box for each of the main Rice fields should be built to standards recommended by Mass Wildlife or Mass Audubon and mounted on poles that are at least 16 and preferably 18 or 20 feet high (see illustrations on page 42). The poles should be sunk at least 3 or 4 feet into the ground and the boxes provided with hinged sides that can be opened for cleaning and inspection. They should be placed toward the middle of the fields, away from brushy edges and away from trails. Volunteers have already offered to construct and install two kestrel boxes.

Public Use – Hunting, Dogs, Camping, Other



Posted sign at the edge of the Matthews property just north of the main north field. Rice property boundaries have generally not been marked.

Signs describing use regulations for the RNP should be installed in prominent locations. Prohibited activities (as specified on the Rice Nature Preserve website) include these:

1. Operating motor vehicles except for authorized maintenance or handicapped access.
2. Camping except by organized youth groups or others with Conservation Commission approval.
3. Lighting campfires or other forms of open flame.
4. Use of the property at night except by Conservation Commission permission.
5. Carrying firearms, and hunting, except such hunting as may be allowed under the same conditions as other Town-owned conservation land, with Conservation Commission approval and posting required.

We recommend that the Town review with Town Counsel the present prohibitions and their enforceability and submit to Town Meeting a more comprehensive set of regulations for all town lands. Regulations should include the following:

- Include, under the prohibition of motor vehicles, specific mention of ATV's, snowmobiles, and motorcycles.
- A specific restriction on bows-and-arrows as well as firearms.
- Prohibitions on trapping and on possession of bows-and-arrows, handguns, and other firearms.
- Prohibitions on the following: littering; digging, cutting, or removing of vegetation; disturbing, defacing, or otherwise causing damage to the property; possession of alcohol; drunkenness; breach of the peace; amplified sound; and disorderly conduct offensive to the general public.

The Stewardship Committee also discussed (Oct 2010) ways to enforce the leash law during nesting season.

It would be wise to develop a comprehensive dog policy that would help educate dog owners about the effects of dogs on ground-nesting bird species. As time goes by, it is likely that more and more dogs will be brought to the Preserve, and if they are allowed to run off-leash they can detrimentally impact ruffed grouse, woodcock, other forest ground nesters like ovenbird and veery, and grassland nesters like savannah sparrow. Once a natural area becomes known as a dog haunt, people from in and out of town will drive out of their way to bring one or several dogs just to get them some exercise, often with little idea of ecological concerns. We recommend that dogs be prohibited from the Rice Preserve during the nesting period April 15 through July 15 to avoid unnecessary disturbance to ground nesters and help the property fulfill its role as a nature preserve.

Working with Abutters –Trespass and other Issues of Mutual Concern



Looking south across the Matthews property, which was formerly the Rice Fruit Farm and is protected from development by a permanent Agricultural Preservation Restriction.

The principal abutters to the Rice Nature Preserve are the Town of Wilbraham to the east and north; the owners of private residences off Apple Hill Road and Highmoor Drive and north of Burleigh Road; and Dr. Robert Matthews, owner of the 87-acre portion of the former Rice Fruit Farm that is now under an Agricultural Preservation Restriction.

It will be helpful to work on a continuing basis with Robert Matthews on the following:

- Ways of discouraging trespass that he has noted on the part of walkers entering his property from the trail that leads north into his orchards from the Highmoor Drive cul-de-sac.
- Discouraging walkers from using his farm roads as access ways to the upper RNP property.
- Maintenance access to the Rice Nature Preserve fields by way of farm roads from Main Street north of Rice Drive on the west and from Tinkham Road on the

north. Dr. Matthews has said that he will happy to allow tractor access from those points provided he is informed of the dates that will occur each year.

- Educating RNP users about private hunting use of the Matthews property. Dr. Matthews manages parts of his land as a private hunting reserve and keeps some of the property unmowed to encourage seasonal use by white-tailed deer.

Inventories of Plants, Birds, Other Ecological Features



Spotted knapweed, a nuisance invasive, near the south end of the main north field. This is a species also found here and there on the adjacent Matthews property.

The appendices to this report include (1) The Rice Nature Preserve Plant Surveys 2008 Report, (2) List of Invasive Plants found on the Rice Nature Preserve, (3) Records of Bird Sightings on the Rice Nature Preserve, and (4) Rice Nature Preserve Trail Map.

The plant survey was carried out in the summer of 2008 by more than 25 New England Wild Flower Society staff and volunteers in collaboration with the Minnechaug Land Trust. The project was funded by the Massachusetts Land Trust Coalition's grant program entitled "Empowering Local Land Trusts in Western Massachusetts." The project identified 219 species of plants growing on the site and classified them according to the Massachusetts Natural Community Classification System. NEWFS botanist Ted

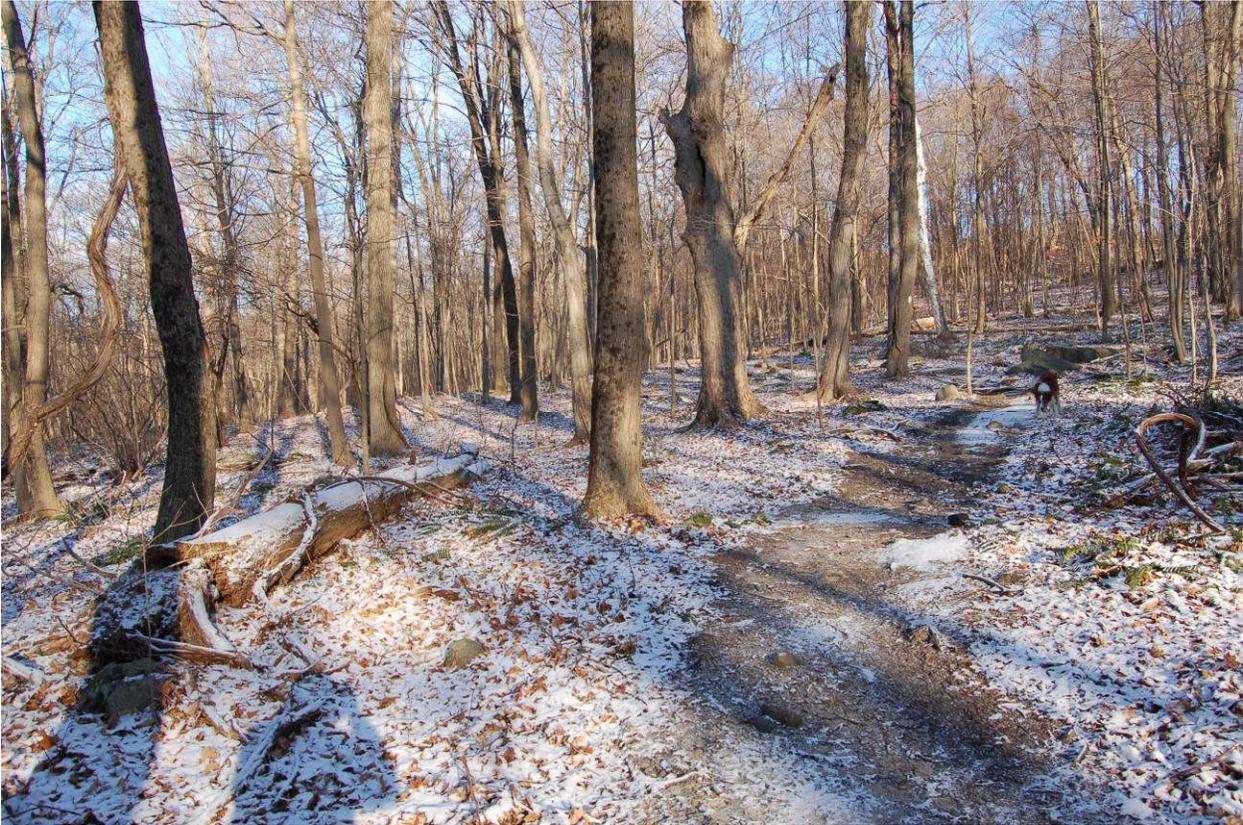
Elliman led the first day of two botanical inventories on the site to get things started.

Plants of special interest that should be watched include *Liriodendron tulipifera*, tulip tree, a species at the northern end of its range; *Tussilago farfara*, coltsfoot, an invasive that appears to be suddenly expanding in many western Mass locations; and various other species that occur only rarely. Fifteen of the 44 non-native species recorded on the property are judged “invasive” (Appendix 2).

Kate Leary has coordinated record-keeping of birds, both nesting and migrant, on the RNP for several years. It will be important to continue to monitor bird populations, especially those found in the main fields where ongoing management can affect their nesting success.

It would also be a good idea to start an inventory of reptiles and amphibians. Wood turtles in particular are scarce, declining in population, and sensitive to disturbance. They can be found along rocky streams like the one that flows along Brookside Trail, and will move into adjacent fields later in the summer, sometimes necessitating the establishment of no-mow buffer zones or extra limitations on the timing of mowing. Searches for wood turtles are best carried out along the banks of rocky streams in the spring when day temperatures are above freezing and night temperatures are below freezing so that the turtles come out of the water to warm up.

Forest Management



Hardwood forest along the Highmoor Trail. Access to much of the Rice Nature Preserve is somewhat difficult for timber harvesting, and much of the forest is fairly young.

The 2005 management plan states that “A sustainable stewardship plan will be developed for the long-range forest management of the property. No logging is to be done during bird nesting season, April 15 – August 15.” Prior to its acquisition by the Town in 2005, the Rice Nature Preserve property was heavily logged. Upon the 2010 inspection of the forests of the Rice Preserve, it does not appear that there is significant potential for timber sales or need for selective cutting at this time. After another ten years of growth, Rice forests should be re-inspected to see if commercial harvesting would make sense.

However, it will be advisable to check wooded areas on the Preserve periodically, to cut or kill invasives shrubs, and possibly to thin around mast-producing trees by cutting, girdling or removing as firewood the competing trees. Valuable native wildlife shrubs like highbush blueberry, spicebush or winterberry should be protected from invasives that may have sprung up around them. Dead snags or cavity trees should be left in place unless they present a safety hazard to adjacent trails.

Potential Links with Adjacent and Nearby Protected Lands



A yellow-blazed trail at the south boundary near the southwest corner of the Rice Preserve.

Future trail connections with other Town-owned protected land in the vicinity may be possible in the future. With volunteer assistance, the Town has already developed an extensive trail system running from the McDonald Preserve south of Route 20 southerly to the Wilbraham Middle School.

Future Land Monitoring

Annual monitoring of the property should include a walk of all trails, boundaries, and fields to make note of any problems and make sure no boundary violations or trail damage has taken place. At least every three years a full monitoring report should be prepared. It should include the following:

- Narrative report of full site inspection.
- Map showing inspection route and any problems or issues noted.
- Notes documenting any changes (from the original baseline documentation report) in property conditions, boundary incursions, or work needed.
- Photographs depicting current conditions of the property and keyed to a photo index map.
- Notes documenting rare species, invasives, or other items of ecological interest.



The stream ravine showing, in the distance, one of the handful of old barrels sitting in or near the stream bed.

CONSERVATION WORKS, LLC. Conservation Works has considerable experience in property monitoring and documentation, boundary marking, habitat improvement, nesting and migratory bird monitoring, turtle monitoring, trail construction and maintenance, and consultation on a wide range of land management issues. If funds are available, the Town and Land Trust might consider using Conservation Works on a task-by-task basis to assist with management in coming years.

ADDITIONAL DOCUMENTARY PHOTOGRAPHS



1. Weeds and brush in the old peach orchard before the late fall mowing.



2. Broken peach tree in the old orchard. Many of the trees are in dilapidated condition.



3. The upper portion of the old peach orchard showing trees uprooted by recent tractor mowing.



4. The lower part of the north field in mid-summer before mowing. Poison ivy and exotic invasives, especially oriental bittersweet and multiflora rose, are abundant.



5. The central part of the north field in December showing grass that is still quite short after a late summer mowing and a dry August and September.



6. Oriental bittersweet in the north field in October following a late summer mowing. Mowing only once each year encourages bittersweet and rose, which rapidly sprout back.



7. Thick poison ivy ground cover under grasses in the north field as seen in July before the field was mowed. Previous herbicide applications have done little to control the ivy.



8. Oriental bittersweet covering the large rock in the lower, W end of the N field. These vines should be hand-cleared from around the rock, which is hard to see while tractor mowing.



9. The sumac patch on the left side of the photo (top of the S field) should be partially or entirely cleared to keep it from advancing into the field. A tractor mowing should take care of most of the sumac.



10. This abandoned field at the junction of the Rachel Phelps and Underpeak Trails is too overgrown to justify clearing and continued mowing, but some multiflora rose cutting, herbiciding, and/or weed-wrenching may be necessary to control the tangle.



11. New bridging is needed on this section of the Highmoor Trail. This view looks south toward a hairpin turn and the junction with the Rachel Phelps Trail.



12. The Weshaugan Trailhead above this point just north of the south field should be relocated by several yards so it is easily found from the field.



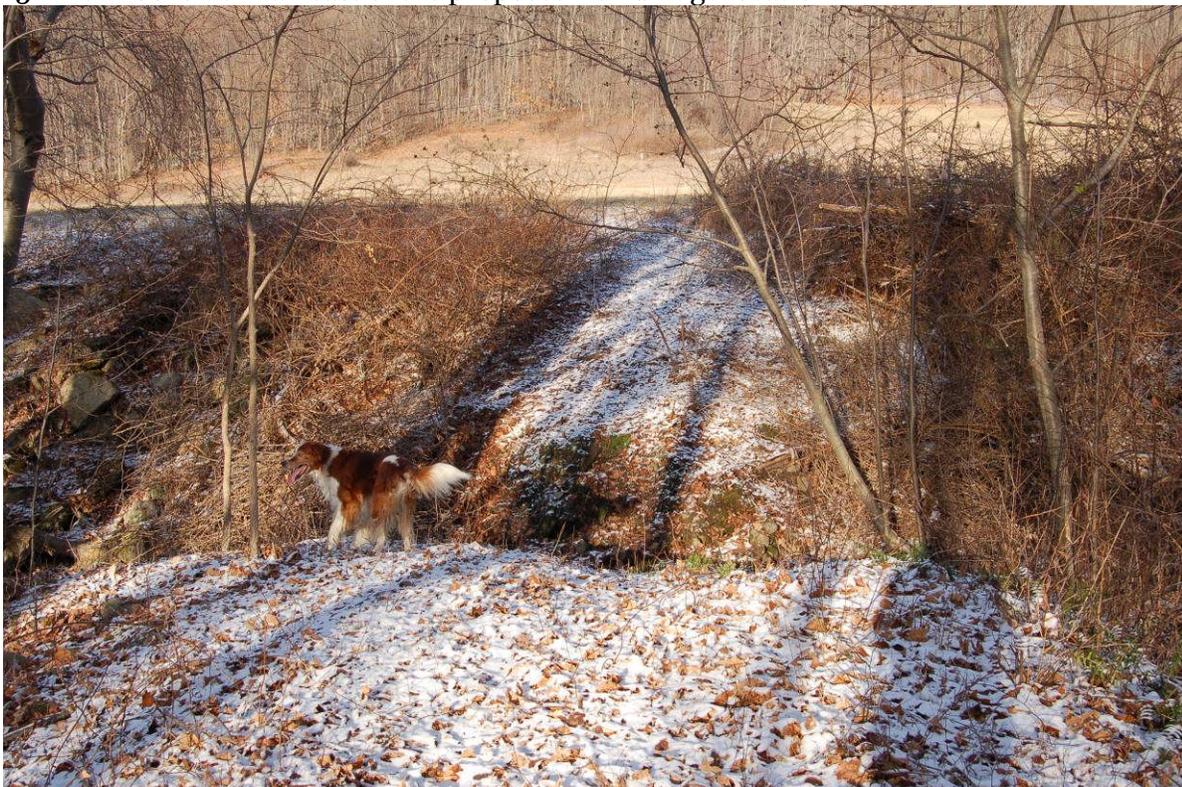
13. The part of the Weshaugan Trail that crosses the north part of the south field will cut across this section but stay clear of the two bluebird boxes sign in the center distance.



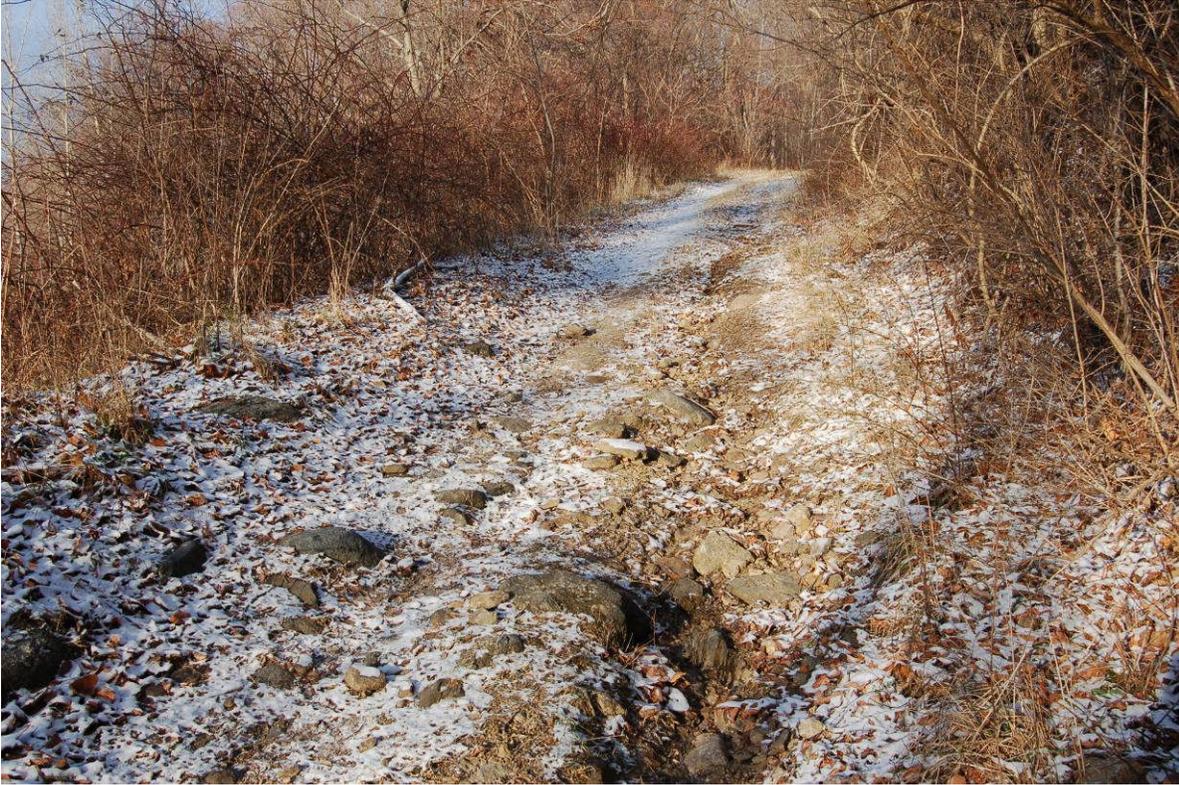
14. The south field. Regular mowing of this and other field trails will keep the grass down and allow easy walking.



15. The Brookside Trail east of the proposed new bridge location.



16. At this point a proposed new footbridge will connect the Brookside Trail with the north field. An optional, heavier bridge would allow a tractor crossing.



17. Repairs to this section of farm road are needed. This portion is just above a sharp turn in the road on the Matthews property below the north field of the Rice Nature Preserve.



18. This section of farm road, just at the sharp bend, is eroding from surface water flow. New gravel and one or two water bars are needed to keep the road from washing out.



19. The iron pin at lower right is at the property corner north of the end of Highmoor Drive. Pins like this should be kept clearly flagged.



20. The flag at right marks the approximate property boundary between the RNP and the Matthews property. The line should be definitely located and marked with boundary signs.



21. A brush pile sits at the edge of private property south of the Highmoor Drive circle. This spot should be checked regularly to be sure further encroachment does not take place.



22. Trespassing onto the Matthews property across this stream gully has been reported. The spot should be clearly posted to keep walkers from inadvertently straying from RNP land.



23. This home sits just outside the RNP boundary near the southeast corner of the property. The boundary line should be exactly located and marked to avoid line incursions.



24. The boundaries should also be located and marked in the vicinity of this home (on Apple Hill Road) off the southwest corner of the Rice Preserve.



25. This old pipe (foreground, white with snow) and various old barrels in the stream ravine should be removed and taken off the property.



26. Two of the bluebird nest boxes situated in the main fields. The boxes should be kept in good condition, repaired, monitored, and cleaned out before each spring nesting season.



27. These two boxes are near the north edge of the south field. The stream ravine is beyond the trees and shrubs in the background.



28. This nest box is at the east, uphill end of the old peach orchard. It might be moved to a spot farther from the main trail.



29. Typical kestrel box in a large field. A ladder is needed to reach the box each winter to clean, check, and ready it for spring.



30. Kestrel boxes can attract screech owls or starlings as well as American kestrels. Kestrels have declined in population because of loss of nest sites and predation by Cooper's hawks.



31. This bench at the south side of the old peach orchard should be treated with preservative and kept in good condition.



32. Regular mowing and clipping around the Rice bench at the top of the south field will keep the spot from becoming overgrown.



33. Open woods along the lower portion of Highmoor Trail. It is questionable whether timber sales on the property would meet with public approval and generate significant revenue.



34. Young woods at the far east end of the property along Peak Road.



35. Young pole-size trees in the stream ravine along Brookside Trail.



36. Two specimen-sized pignut hickories located at the edge of Matthews property north of Highmoor Trail.

Appendices

1. Rice Nature Preserve Plant Surveys 2008 Report

RICE NATURE PRESERVE PLANT SURVEYS 2008: REPORT

Ted Elliman and Kaya Schmandt, New England Wild Flower Society
December 2008

Introduction

New England Wild Flower Society (NEWFS) staff and volunteers, in collaboration with the Minnechaug Land Trust, conducted a botanical inventory of the Rice Nature Preserve during the summer of 2008. The project was funded by the Massachusetts Land Trust Coalition's "Empowering Local Land Trusts in Western Massachusetts" Grant Program.

The goals of the inventory project were to:

- 1) Compile a comprehensive floristic list of the Rice Nature Preserve
- 2) Classify the site's natural communities
- 3) Search for and document plant species or communities listed as endangered, threatened, special concern and watch-list by the state of Massachusetts' Natural Heritage and Endangered Species Program
- 4) Document the site's invasive plant populations
- 5) Recommend management strategies for invasive species removal
- 6) Lead an invasive species management workday

NEWFS staff and volunteers joined Land Trust volunteers on two field-days during June and July of 2008 to compile an extensive list of the flora growing in the 150-acre Rice Nature Preserve. In total, we identified 219 species growing on the site. Plant communities were described and classified according to the Massachusetts natural community classification system (Swain and Kearsley 2001). Additionally, Land Trust volunteers mapped the infestations of the site's invasive species populations. In October of 2008, NEWFS staff and Land Trust volunteers conducted an invasive species management day, which focused on the invasive shrub thickets on the western edge of the property.

The Rice Nature Preserve is located in Wilbraham, Massachusetts. It is managed by the Minnechaug Land Trust. Much of the site was used as agricultural land prior to its purchase by the town of Wilbraham in 2005. An active peach orchard is still in operation in the northwestern part of the property; however, much of the land has been allowed to revert to wild vegetation. The Preserve owns Rattlesnake Peak (elevation 800 feet) and the surrounding lowlands, which drop to 380 feet at the Highmoor Drive entrance to the property. The area is part of the Connecticut Valley Ecoregion of the Commonwealth (Griffith et al. 1999). With the exception of narrow stream corridors in the northern and western ends of the property, almost the entire site consists of upland plant communities.

Field Survey Methods

This project was supported by a generous grant from the Massachusetts Land Trust Coalition. A number of people with the Minnechaug Land Trust gave very generously of their time and efforts throughout this project. Sherry Himmelstein, Kate Leary, and Steve Lawson enthusiastically helped with the organizational phase of the project, and Kate and Tom Leary worked hard to bring the proposal to fruition.

Kathy Barz did a remarkable job recruiting, organizing, and motivating the Minnechaug Land Trust volunteers, whose contributions in field inventories and invasive management at both Minnechaug Mountain and Rice Nature Preserve were essential to the success of the project. Many Land Trust volunteers spent many hours in the field. Individuals who participated include:

Minnechaug Land Trust volunteers

Mary Bacon
Bill Barz
Kathy Barz
Ginney Blake
Judy McKinley Brewer
Pat Burke
Amanda Carron
Margie Connell
Carole Dupont
Karla Grant
Jacob Landcik
Kate Leary
Linda Leed
Ed McCorkindale
Robert Olsen
Barbara Pilarcik
Sandy Porcelli
Amy Toulson
Connie Witt
Ken Wagner
Mary Wagner
Marjorie Williams

New England Wild Flower Society volunteer (PCV)

Jim Wickis

IPANE volunteer

Bill Hersh

On June 7, 2008, NEWFS botanist Ted Elliman led the first day of two botanical inventories on the site. Land trust volunteers joined him and NEWFS staff member Kaya Schmandt, and the group spent the day cataloguing all of the vascular plant species that they observed on the site. Most of the species identifications took place on-site, using popular (e.g.

Newcomb 1978) and technical field manuals (e.g. Gleason and Cronquist 1991, Sorrie and Somers 1999). Species that were difficult to identify were collected, pressed, and identified in the office. During the inventory, surveyors also categorized the site's plant communities according to the Massachusetts Natural Heritage and Endangered Species Program's natural community classification system (Swain and Kearsley 2001). Locations of state watch-listed plants were documented using a Garmin Map76 GPS unit.

On July 19, 2008, NEWFS staff and NEWFS volunteer Jim Wickis continued surveying the site's flora, while Minnechaug Land Trust field surveyors mapped the site's invasive plant populations.¹

Field Survey Results

FLORA

We identified a total of 219 plant taxa in the Rice Nature Preserve. These species break down into the following growth-habits:

Trees: 31
Shrubs and woody vines: 37
Forbs and prostrate woody plants: 118
Graminoids: 23
Ferns and fern allies: 10

172 (79%) of these species are native to New England, and 47 (21%) are not native to the region. Fourteen of the 44 non-native species are considered to be invasive (see "Invasive Species," below), and one of the species found on the site is on the Massachusetts Natural Heritage and Endangered Species Program's watch-list (see "Rare Plants and Communities").

NATURAL COMMUNITIES

Before the Minnechaug Land Trust acquired the Rice Nature Preserve, the property was actively used as farmland. Since agricultural abandonment has been very recent, much of the property is comprised of old fields and shrub thickets in various stages of succession. The open meadow on the north side of the property contains a number of common meadow species, such as common milkweed (*Asclepias syriaca*), Queen Anne's lace (*Daucus carota*), and a mixture of non-native grasses like Kentucky bluegrass (*Poa pratensis*) and orchard grass (*Dactylis glomerata*). The area to the southwest of the meadow, along the Rachel Phelps trail, is dominated by mid-successional shrub thickets. These thickets are comprised primarily of invasive species, such as multiflora rose (*Rosa multiflora*), oriental bittersweet (*Celastrus orbiculatus*), both common and glossy buckthorn (*Rhamnus cathartica* and *Frangula alnus*), and Japanese barberry (*Berberis thunbergii*). Shrub thickets and early successional woodlands also occur in the southern part of the site along the Under Peak Trail.

We did find two relatively mature forest community associations, which we categorized according to Swain and Kearsley's natural community classification (2001).

¹ These invasive species maps were used by Kathy Barz and other Land Trust volunteers to prioritize areas and invasive species populations for the management workday on November

Near the Highmoor Drive entrance to the Preserve, flanking both sides of the Highmoor Trail, we identified a mature forest stand that has some of the qualities of a rich, mesic forest community, although this stand lacks the diversity characteristic of those sugar maple-dominated communities.

The canopy at this location is dominated by white ash (*Fraxinus americana*) and sugar maple (*Acer saccharum*), with lower abundances of American elm (*Ulmus americana*), paper birch (*Betula papyrifera*) and black birch (*Betula nigra*). Hop hornbeam (*Ostrya virginiana*) is present in the sub-canopy. An assemblage of herbaceous species identified here, including red trillium (*Trillium erectum*), bloodroot (*Sanguinaria canadensis*), and doll's eyes (*Actaea pachypoda*), are characteristic of the mesic forest community type. Spicebush (*Lindera benzoin*), skunk cabbage (*Symplocarpus foetidus*), jack-in-the-pulpit (*Arisaema triphyllum*), and spotted touch-me-not (*Impatiens capensis*), species indicative of wet soil, occur along a streambed that runs through this forest stand. Unfortunately, large populations of invasive plants, including burning bush, oriental bittersweet, Japanese barberry, and garlic mustard occur in these woods (see "Invasive Species," below, for further discussion of these plants).

The other relatively mature forest community identified on the property was an oak-hickory forest on the summit of Rattlesnake Peak. The overstory is dominated pignut and shagbark hickories (*Carya glabra* and *C. ovata*), as well as white, red and black oaks (*Quercus alba*, *Q. rubra*, and *Q. velutina*). The ericaceous shrub layer is dominated by black huckleberry (*Gaylussacia baccata*) and lowbush blueberries (*Vaccinium angustifolium* and *V. pallidum*). Mapleleaf viburnum (*Viburnum acerifolium*) is also abundant in this stand.

This oak-hickory community extends to the south of Rattlesnake Peak, where we encountered ledges with a large population of forked chickweed (*Paronychia canadensis*) and a number of sedge species. Forked chickweed can be indicative of a relatively high nutrient substrate, so there is the possibility of unusual flora at this location. We recommend that the ledges be surveyed again, particularly in May and June when more plant species are in flower.

Along the Underpeak, Weshaugan, and Rattlesnake trails, the oak-hickory forest becomes patchy and fragmented, interspersed with early successional woodlands and thickets.

RARE PLANTS AND COMMUNITIES

We identified one species that is on the Massachusetts Natural Heritage and Endangered Species Program's watch-list. Butternut (*Juglans cinerea*) is on the list because most of these trees in Massachusetts are infected by a cankerous disease spread by the fungus *Sirococcus clavigignenti-juglandacearum*. Although the four butternut trees growing at Rice are probably infected by the fungus, some butternut trees are partially resistant to the cankers and can live for a long while.

INVASIVE SPECIES

We identified the following 14 invasive species² growing at the Rice Nature Preserve:

Garlic mustard (*Alliaria petiolata*)
Japanese barberry (*Berberis thunbergii*)
Oriental bittersweet (*Celastrus orbiculatus*)
Autumn olive (*Elaeagnus umbellata*)
Burning bush (*Euonymus alatus*)
Glossy buckthorn (*Frangula alnus*)
Morrow's honeysuckle (*Lonicera morrowii*)
Reed canary grass (*Phalaris arundinacea*)
Canada bluegrass (*Poa compressa*)
Oriental lady's thumb (*Polygonum cespitosum*)
Common buckthorn (*Rhamnus cathartica*)
Multiflora rose (*Rosa multiflora*)
Sheep sorrel (*Rumex acetosella*)
Colt's foot (*Tussilago farfara*)

Of these species, an assemblage of shrubs and woody vines (Japanese barberry, oriental bittersweet, burning bush, glossy buckthorn, common buckthorn, and multiflora rose) are the most abundant invasive species on the site. Garlic mustard is also common in the mesic forest along the Highmoor Trail. The shrubs and vines form dense thickets along the eastern part of the Highmoor Trail, and along the Rachel Phelps and Underpeak Trails. The Brookside Trail is also densely populated by invasive shrubs, primarily multiflora rose, Japanese barberry and burning bush. The other listed invasive species were found in much lower abundances scattered throughout the site.

The oak-hickory community on Rattlesnake Peak is remarkably free of invasives compared with the rest of the site, but, southeast of the peak area, we found multiflora rose, Japanese barberry, burning bush and common buckthorn growing near rocky outcroppings.

The interior of the mesic forest growing on the western edge of the property is also relatively pristine. However, the western edge of the stand, alongside Highmoor Drive, is vulnerable to infestations. Moreover, the eastern edge of the stand is bordered by encroaching thickets of multiflora rose, oriental bittersweet and common buckthorn.

Invasive Species Management

MANAGEMENT DAY SUMMARY

On October 4, 2008, NEWFS staff members joined land-trust volunteers to conduct invasive species management on-site. The crew divided into two groups—one focused on invasive species along the Highmoor Trail, and the other focused on the invasive shrubs growing along the Rachel Phelps Trail. Smaller shrubs were hand-pulled, while weed-wrenches were used to remove the larger plants. Species that were removed included multiflora rose, burning bush, common and glossy buckthorn, Morrow's honeysuckle, oriental bittersweet, and

² Invasive species are defined by the Massachusetts Invasive Plant Advisory Group (MIPAG) as “non-native species that have spread into native or minimally managed plant systems in Massachusetts, causing economic or environmental harm by developing self-sustaining populations and becoming dominant and/or disruptive to those systems” (MIPAG 2008). The species that we list in our report are considered invasive by the Invasive Plant Atlas of New England (IPANE).

Japanese barberry.

RECOMMENDATIONS FOR FURTHER MANAGEMENT

We recommend that future invasive species management at Rice focus on conserving the natural plant communities found on the site. Management priority should be invasive removal in the mesic forest community east of Highmoor Drive. This was one of the areas targeted on the October field-day. We believe that invasive species can be significantly reduced in this mature and relatively diverse community through continuing efforts. We suggest hand-pulling and weed wrenches for invasive removal in this area.

We also recommend that Land Trust volunteers monitor the populations of other invasive populations species growing on the property. These species are autumn olive, Morrow's honeysuckle, reed canary grass, Canada bluegrass, Oriental lady's thumb, sheep sorrel, and colt's foot. If any of these species start becoming more abundant, we advise rapid management while the infestation is easily controllable. At this point, however, we do not believe that these species pose significant risk to the site, and we do not suggest immediate management.

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Minnechaug Land Trust volunteers

Mary Bacon
Bill Barz
Kathy Barz
Ginney Blake
Judy McKinley Brewer
Pat Burke
Amanda Carron
Margie Connell
Carole Dupont
Karla Grant
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Sandy Porcelli
Amy Toulson
Connie Witt
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New England Wild Flower Society volunteer (PCV)
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IPANE volunteer
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**Rice Nature Preserve:
Plant Inventory - 6/7/2008 and 7/19/2008**

Key:

H Highmoor Trail
W Washaugan
F Field past rattlesnake peak
RP Rachel Phelps
O Orange trail
S Sunrise trail

[^] Exotic (Sorrie and Somers 1999)
[*] Designated "Invasive" (MIPAG 2005)

| Latin Name | Common Name | Location |
|--------------------------|--------------------|----------|
| Trees | | |
| Acer rubrum | Red maple | H |
| Acer saccharum | Sugar maple | H |
| Betula alleghaniensis | Yellow birch | H |
| Betula lenta | Black birch | H |
| Betula papyrifera | Paper birch | H |
| Betula populifolia | Gray birch | RP (F) |
| Carya alba (tomentosa) | Mockernut hickory | W |
| Carya cordiformis | Bitternut Hickory | RP |
| Carya glabra | Pignut hickory | W |
| Carya ovata | Shagbark hickory | H |
| Castanea dentata | American chestnut | W |
| Catalpa bignonioides [^] | Catalpa | O |
| Crataegus sp. | Hawthorn sp. | W |
| Fagus grandifolia | American beech | H |
| Fraxinus americana | White ash | H |
| Juglans cinerea | Butternut | H |
| Juniperus communis | Common juniper | W |
| Juniperus virginiana | Red cedar | H, RP |
| Liriodendron tulipifera | Tulip tree | O |
| Ostrya virginiana | Hop hornbeam | H |
| Picea abies | Norway spruce | RP (F) |
| Pinus strobus | White pine | H |
| Populus deltoides | Eastern cottonwood | H |
| Populus grandidentata | Bigtooth aspen | H |
| Populus tremuloides | Quaking aspen | RP |
| Prunus serotina | Black cherry | H |
| Quercus alba | White oak | H |
| Quercus rubra | Red oak | H |
| Quercus velutina | Black oak | H |
| Tsuga canadensis | Eastern hemlock | H |
| Ulmus americana | American_elm | H |

| Shrubs, Woody Vines, & Brambles | | |
|--|----------------------------|--------|
| <i>Alnus incana</i> ssp. <i>rugosa</i> | Speckled alder | RP |
| <i>Amelanchier laevis</i> | Smooth shadbush | W |
| <i>Berberis thunbergii</i> [*] | Japanese barberry | 0 |
| <i>Comptonia peregrina</i> | Sweetfern | RP |
| <i>Comus alternifolia</i> | Alternate-leaf dogwood | H |
| <i>Comus amomum</i> | Swamp dogwood | RP |
| <i>Comus racemosa</i> | Graystem dogwood | W |
| <i>Corylus comuta</i> | Beaked hazlenut | H |
| <i>Elaeagnus umbellata</i> [*] | Autumn olive | RP (F) |
| <i>Euonymus alatus</i> [*] | Burning bush | H |
| <i>Frangula alnus</i> [*] | Glossy buckthorn | H |
| <i>Gaylussacia baccata</i> | Black huckleberry | W |
| <i>Hamamelis virginiana</i> | Witch hazel | H |
| <i>Ihex verticillata</i> | Winterberry | H |
| <i>Lindera benzoin</i> | Spice bush | H |
| <i>Lonicera morrowii</i> [*] | Morrow's honeysuckle | H |
| <i>Parthenocissus quinquefolia</i> | Virginia creeper | H |
| <i>Rhamnus cathartica</i> [*] | Common buckthorn | H |
| <i>Rhus typhina</i> | Staghorn sumac | H |
| <i>Rosa carolina</i> | Pasture rose | H |
| <i>Rosa multiflora</i> [*] | Multiflora rose | H, RP |
| <i>Rubus occidentalis</i> | Black raspberry | H |
| <i>Rubus</i> sp. | Blackberry sp. | H |
| <i>Salix discolor</i> | Pussy willow | W |
| <i>Salix</i> sp. | Willow | RP |
| <i>Sorbus aucuparia</i> [^] | European mountain ash | 0 |
| <i>Spiraea alba</i> var. <i>latifolia</i> | Meadowsweet | W |
| <i>Spiraea tomentosa</i> | Steeplebush | 0 |
| <i>Vaccinium angustifolium</i> | Late lowbush blueberry | W |
| <i>Vaccinium pallidum</i> | Early lowbush blueberry | H |
| <i>Viburnum acenfolium</i> | Mapleleaf viburnum | W |
| <i>Viburnum lantana</i> [^] | Wayfaring tree | 0 |
| <i>Viburnum lentago</i> | Nanny berry | H |
| <i>Viburnum opulus</i> | Highbush cranberry | H |
| <i>Vitis aestivalis</i> | Summer grape | H |
| <i>Vitis labrusca</i> | Fox grape | 0 |
| <i>Vitis riparia</i> | Riverbank grape | RP |
| Forbs & Prostrate Woody Plants | | |
| <i>Achillea millefolium</i> | Common yarrow | H |
| <i>Actaea pachypoda</i> | Doll's eyes | H |
| <i>Ageratina altissima</i> | White snakeroot | H |
| <i>Agrimonia gryposepala</i> | Agrimony | RP |
| <i>Alliaria petiolata</i> [*] | Garlic mustard | H |
| <i>Ambrosia artemisiifolia</i> | Ragweed | H |
| <i>Amphicarpaea bracteata</i> | Hog peanut | H |
| <i>Anemone quinquefolia</i> | Wood anemone | H |
| <i>Antennaria plantaginifolia</i> | Plaintain-leaved pussytoes | 0 |

| | | |
|---|---------------------------------|--------|
| <i>Antennaria</i> sp. | Pussytoes | H |
| <i>Apios americana</i> | Ground-nut | 0 |
| <i>Arabis glabra</i> | Tower mustard | W |
| <i>Aralia nudicaulis</i> | Wild sarsparilla | W |
| <i>Arctium minus</i> [^] | Common burdock | H |
| <i>Arisaema triphyllum</i> | Jack in the pulpit | H |
| <i>Asclepias syriaca</i> | Common milkweed | H |
| <i>Asparagus officinalis</i> [^] | Wild asparagus | RP (F) |
| <i>Barbarea vulgaris</i> [^] | Winter cress | 0 |
| <i>Bidens frondosa</i> | Beggars ticks | S |
| <i>Cardamine</i> sp. | Bittercress | RP (F) |
| <i>Celastrus orbiculatus</i> [*] | Oriental bittersweet | RP (F) |
| <i>Cerastium fontanum</i> ssp. <i>vulgare</i> [^] | Mouse-ear chickweed | W |
| <i>Chenopodium album</i> [^] | Lamb's quarters | RP |
| <i>Chimaphila maculata</i> | Spotted wintergreen | H |
| <i>Circaea alpina</i> | Dwarf enchanter's nightshade | 0 |
| <i>Circaea lutetiana</i> | Enchanter's nightshade | H |
| <i>Cirsium vulgare</i> [^] | Bull thistle | 0 |
| <i>Daucus carota</i> [^] | Queen Anne's lace | S |
| <i>Desmodium</i> sp. | Tick trefoil | RP |
| <i>Epipactis helleborine</i> [^] | Helleborine | RP |
| <i>Equisetum arvense</i> | Common horsetail | RP |
| <i>Erechtites hieraciifolia</i> | Fireweed | 0 |
| <i>Erigeron annuus</i> | Eastern daisy fleabane | 0 |
| <i>Erigeron philadelphicus</i> | Common fleabane | RP (F) |
| <i>Erigeron pulchellus</i> | Robin's fleabane | H |
| <i>Erigeron strigosus</i> | Fleabane | H |
| <i>Eupatorium maculatum</i> | Spotted Joe-Pye weed | 0 |
| <i>Eurybia divaricata</i> | White wood aster | S |
| <i>Euthamia graminifolia</i> | Grass-leaved goldenrod | S |
| <i>Fragaria virginiana</i> | Wild strawberry | H |
| <i>Galium aparine</i> | Cleavers | H |
| <i>Galium lanceolatum</i> | Lanceleaf wild licorice | S |
| <i>Geranium maculatum</i> | Wild geranium | H |
| <i>Geum canadense</i> | White avens | 0 |
| <i>Hedeoma pulegioides</i> | False pennyroyal | 0 |
| <i>Hieracium paniculatum</i> | Panicled hawkweed | 0 |
| <i>Houstonia caerulea</i> | Bluet | H |
| <i>Hylotelephium telephium</i> [^] | Sedum | H |
| <i>Hypericum canadense</i> | Lesser Canadian St. John's wort | 0 |
| <i>Hypericum perforatum</i> [^] | Common St. John's wort | 0 |
| <i>Hypericum punctatum</i> | Spotted St. John's wort | 0 |
| <i>Impatiens capensis</i> | Spotted jeweiweed | H |
| <i>Lechea</i> sp. | | 0 |
| <i>Leonurus cardiaca</i> [^] | Motherwort | S |
| <i>Lepidium campestre</i> | Field pepperweed | RP (F) |
| <i>Lespedeza hirta</i> | Hairy bush clover | S |
| <i>Lespedeza</i> sp. | Bush clover sp. | W |
| <i>Linaria vulgaris</i> [^] | Butter-and-eggs | RP |

| | | |
|---|--------------------------|--------|
| <i>Lobelia inflata</i> [^] | Indian tobacco | 0 |
| <i>Lonicera</i> sp. | Honeysuckle | RP (F) |
| <i>Lysimachia quadrifolia</i> | Whorled loostnfe | H |
| <i>Maianthemum canadense</i> | Canada mayflower | H |
| <i>Melampyrum lineare</i> | Cowwheat | S |
| <i>Monotropa uniflora</i> | Indian pipe | H |
| <i>Osmorhiza claytoni</i> | Sweet cicely | H |
| <i>Oxalis stricta</i> | Wood sorrel | RP (F) |
| <i>Paronychia canadensis</i> | Forked chickweed | 0 |
| <i>Phytolacca americana</i> | Pokeweed | H |
| <i>Plantago lanceolata</i> [^] | English plantain | H |
| <i>Polygonatum pubescens</i> | King Solomon's seal | H |
| <i>Polygonum cespitosum</i> [*] | Oriental lady's thumb | 0 |
| <i>Polygonum scandens</i> | Climbing false buckwheat | RP (F) |
| <i>Potentilla argentea</i> [^] | Silvery cinquefoil | RP (F) |
| <i>Potentilla canadensis</i> | Dwarf cinquefoil | W |
| <i>Potentilla recta</i> [^] | Rough-rooted cinquefoil | S |
| <i>Potentilla simplex</i> | Common cinquefoil | H |
| <i>Prunella vulgaris</i> | Heal-all | H |
| <i>Pyrola elliptica</i> | Shinleaf pyrola | H |
| <i>Ranunculus abortivus</i> | Little-leaf buttercup | 0 |
| <i>Ranunculus acris</i> [^] | Tall buttercup | RP (F) |
| <i>Ranunculus bulbosus</i> [^] | Bulbous buttercup | RP (F) |
| <i>Rubus flagellaris</i> | Northern dewberry | 0 |
| <i>Rubus hispidus</i> | Bristly dewberry | H |
| <i>Rumex acetosella</i> | Sheep sorrel | W |
| <i>Rumex crispus</i> [^] | Curly dock | RP (F) |
| <i>Sanguinaria canadensis</i> | Bloodroot | H |
| <i>Satureja vulgaris</i> [^] | Wild basil | H |
| <i>Sisyrinchium angustifolium</i> | Stout blue-eyed grass | RP |
| <i>Smilacina racemosa</i> | False Solomon's seal | H |
| <i>Smilax herbacea</i> | Carrion flower | H |
| <i>Solidago bicolor</i> | Silverrod | S |
| <i>Solidago caesia</i> | Blue Stem Goldenrod | H |
| <i>Solidago canadensis</i> | Canada goldenrod | RP (F) |
| <i>Solidago juncea</i> | Early goldenrod | H |
| <i>Solidago rugosa</i> | Rough stem goldenrod | W |
| <i>Stellaria graminea</i> [^] | Lesser stitchwort | RP (F) |
| <i>Symphotrichum cordifolium</i> | Common blue wood aster | H |
| <i>Symplocarpus foetidus</i> | Skunk cabbage | H |
| <i>Taraxacum officinale</i> [^] | Dandelion | H |
| <i>Thalictrum pubescens</i> | Tall meadow rue | H |
| <i>Toxicodendron radicans</i> | Poison ivy | H |
| <i>Tragopogon lamottei</i> | Goatsbeard | H |
| <i>Trientalis borealis</i> | Starflower | H |
| <i>Trifolium pratense</i> [^] | Red clover | RP (F) |
| <i>Trifolium repens</i> [^] | White clover | RP |
| <i>Trillium erectum</i> | Red trillium | H |
| <i>Tussilago farfara</i> [*] | Coltsfoot | W |
| <i>Urtica dioica</i> | Stinging nettle | RP |
| <i>Urtica dioica</i> ssp. <i>gracilis</i> | Tall stinging nettle | RP |

| | | |
|--------------------------------------|----------------------|--------|
| Uvularia sessilifolia | Wild oats | H |
| Verbascum thapsus | Common mullein | 0 |
| Verbena urticifolia | White vervain | 0 |
| Veronica officinalis [^] | Common speedwell | H |
| Vicia tetrasperma [^] | Lentil vetch | H |
| Viola fimbriatula | Ovate leaf violet | W |
| Viola pensylvanica | Smooth yellow violet | H |
| Viola sp. | Violetsp. | H |
| Vivia cracca [^] | Cow vetch | RP (F) |
| Grasses, Sedges, & Rushes | | |
| Agrostis stolonifera | Creeping bentgrass | H |
| Anthoxanthum odoratum [^] | Sweet vernal grass | H, RP |
| Carex cephalophora | Oval-leaf sedge | W |
| Carex gracillima | Graceful sedge | H |
| Carex lurida | Shallow sedge | 0 |
| Carex pensylvanica | Pennsylvania sedge | H |
| Carex platyphylla | Broadleaf sedge | H |
| Carex virescens | Ribbed sedge | H |
| Carex vulpinoidea | Fox sedge | 0 |
| Dactylis glomerata [^] | Orchard grass | W |
| Danthonia spicata | Poverty oatgrass | 0 |
| Elymus hystrix | Bottlebrush grass | 0 |
| Juncus effusus | Soft rush | 0 |
| Juncus tenuis | Path rush | H |
| Leersia virginica | Whitegrass | H |
| Luzula multiflora | Woodrush | H |
| Panicum sp. | Panic grass | 0 |
| Phalaris arundinacea [*] | Reed canary grass | 0 |
| Poa compressa [*] | Canada bluegrass | H |
| Poa pratensis [^] | Kentucky bluegrass | W |
| Rhynchospora capitellata | Brownish beaksedge | 0 |
| Scirpus hattorianus | Mosquito bullrush | 0 |
| Setaria sp. [^] | Foxtail grass | H |
| Ferns and Fern Allies | | |
| Athyrium filix-femina | Lady fern | H |
| Dendrolycopodium obscurum | Princess pine | W |
| Dennstaedtia punctilobula | Hayscented fern | W |
| Dryoptenis intermedia | Evergreen wood fern | H |
| Dryoptenis marginalis | Marginal wood fern | 0 |
| Onoclea sensibilis | Sensitive fern | H |

2. Invasive Plants of the Rice Preserve (from 2008 Plant Survey)

| <u>Latin Name</u> | <u>Common Name</u> |
|-----------------------|-----------------------|
| Berberis thunbergii | Japanese barberry |
| Alaegagnus umbellata | Autumn olive |
| Euonymus alatus | Burning bush |
| Frangula alnus | Glossy buckthorn |
| Lonicera morrowii | Morrow's honeysuckle |
| Rhamnus cathartica | Common buckthorn |
| Rosa multiflora | Multiflora rose |
| Sorbus aucuparia | European mountain-ash |
| Virburnum lantana | Wayfaring tree |
| Alliaria petiolata | Garlic mustard |
| Celastrus orbiculatus | Oriental bittersweet |
| Tussilago farfara | Coltsfoot |
| Polygonum cespitosum | Oriental lady's thumb |
| Phalaris arundinacea | Reed canary grass |
| Poa compressa | Canada bluegrass |

3. BIRD LIST FOR RICE NATURE PRESERVE (Courtesy of Kate Leary)

Key **Bold face = breeding bird;**
PR = Permanent Resident (present throughout the year).
* = species declining significantly due to habitat loss.

Half of New England's land bird species are significantly decreasing in number, according to data from 32 years of spring and fall bird banding at Manomet (1970-2001). Wood Thrush is the overall loss leader; in general, the declines are most severe for forest-dwelling neotropical migrants such as Red-eyed Vireo, American Redstart, and Scarlet Tanager" (Manomet Center for Conservation Sciences, Plymouth, MA). American Woodcock is severely threatened due to loss of specific wet wooded habitat requirement (Audubon).

American Woodcock *
Turkey Vulture
Sharp-shinned Hawk
Cooper's Hawk, PR
Broad-winged Hawk
Red-tailed Hawk, PR
American Kestrel
Ruffed Grouse, PR
Wild Turkey, PR
Mourning Dove, PR
Black-billed Cuckoo
Eastern Screech-owl, PR
Great Horned Owl, PR
Barred Owl, PR
Chimney Swift
Ruby-throated Hummingbird
Red-bellied Woodpecker, PR
Downy Woodpecker, PR
Hairy Woodpecker, PR
Northern Flicker, PR
Pileated Woodpecker, PR
Eastern Wood-pewee
Eastern Phoebe
Great Crested Flycatcher
Blue-headed Vireo
Warbling Vireo
Red-eyed Vireo
Blue Jay, PR
American Crow, PR
Black-capped Chickadee, PR
Tufted Titmouse, PR
Red-breasted Nuthatch, PR
White-breasted Nuthatch, PR
Brown Creeper, PR
Carolina Wren, PR
House Wren

Golden-crowned Kinglet
Ruby-crowned Kinglet
Eastern Bluebird, PR
Veery
Hermit Thrush
Wood Thrush *
American Robin, PR
Gray Catbird
Northern Mockingbird, PR
Brown Thrasher
European Starling, PR
Cedar Waxwing, PR
Blue-winged Warbler
Northern Parula
Yellow Warbler
Chestnut-sided Warbler
Magnolia Warbler
Black-throated Blue Warbler
Yellow-rumped Warbler
Black-throated Green Warbler
Blackburnian Warbler
Pine Warbler
Prairie Warbler
Palm Warbler
American Redstart *
Worm-eating Warbler
Ovenbird
Common Yellowthroat
Canada Warbler
Scarlet Tanager *
Eastern Towhee
American Tree Sparrow
Chipping Sparrow
Fox Sparrow
Song Sparrow
White-throated Sparrow
Dark-eyed Junco
Northern Cardinal, PR
Rose-breasted Grosbeak
Indigo Bunting
Red-winged Blackbird
Brown-headed Cowbird
Baltimore Oriole
House Finch
Common Redpoll
Pine Siskin
American Goldfinch, PR
House Sparrow