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Date: August 1, 2018

To: Land Stewardship Subcommittee (LSC), Conservation Commission (CC), Trustees of the Trust Funds, Michael Behrendt (Town Planner)

From: Ellen Snyder, Land Stewardship Coordinator

Subj: Doe Farm Stewardship Issues

This year we've directed some of our stewardship focus on the 87-acre Doe Farm off Bennett Road. At the LSC, CC, and Doe Farm working group meetings we have discussed the invasive plant control initiative, forestry, trail improvements, and cemetery maintenance. At the July 23rd Conservation Commission meeting we discussed several additional issues: tree falls into the Lamprey River and camping, fires, trails, and fireworks on Moat Island (which is part of Doe Farm). I'm providing this update on these stewardship issues with maps, recommended next steps, and estimated budget needs (page 7) in advance of discussion at the August LSC and CC meetings.

Invasive Plant Control and Forest Management

Invasive plant control was begun in 2016, based on a plan developed by consulting forester Charlie Moreno (See map on page 2). The goal is to control invasive plants to restore forest health and ensure long-term sustainability of the forest resource and produce income through periodic timber harvests. Moreno recommends that the next timber harvest not occur until invasive plants are controlled, which may take up to five years. The approach selected was a two-step process: first cut the medium to large glossy buckthorns then treat with herbicides after a new flush of growth.

In 2016, Turfpro (Bill Price) was hired to implement this plan on 13 acres with the most severe infestation at a cost of \$12,600. No treatments occurred in 2017 due to lack of funding. In 2018, Turfpro was hired to cut the buckthorn stems across the entire main section of Doe Farm, approximately 67 acres at a cost of \$4,000. This was completed in July. Turfpro proposes to return in Spring 2019 to treat the cut stems with herbicide. This approach will likely be needed for 2-3 more years, but anticipate a reduced effort each subsequent year due to effectiveness of treatment.

Next Steps:

- Identify funding source for Spring 2019 herbicide treatment. Anticipated cost is around \$9,000. Due to the expense, I recommend that we draft an RFP to get several quotes including from TurfPro.
- The invasives control plan includes a volunteer component to assist in pulling small buckthorn seedlings, which are numerous throughout the property, including on Moat Island. Schedule volunteer work days, hire a contractor, and/or hire a summer intern to assist the Land Stewardship Coordinator with this effort.
- Assess invasive control in summer 2019 to determine next phase of project.

Map of the Town of Durham's

DOE FARM

Durham, New Hampshire

87± acres

Showing Areas of Non-Native, Invasive Plant Infestation



Acreage of Severe Polygons	
A	< 0.1± acres
B	1.4± acres
C	1.4± acres
D	2.9± acres
E	0.1± acres
F	0.1± acres
G	4.6± acres
H	0.1± acres
I	1.3± acres
J	< 0.1± acres
K	0.2± acres
L	1.0± acres
M	0.1± acres
Total:	13.2± acres

Notes:

- 1) Edges of railroad tracks and sections of the Lamprey riverfront contain invasive plants.
- 2) Relatively small concentrations of invasives – “hotspots” – are found in green areas, along with scattered plants.
- 3) Orange areas have more/larger hotspots, as well as individual plants.
- 4) The understory of severe areas – red – contains invasive plants almost exclusively.
- 5) Glossy buckthorn is the most common invasive species on Doe Farm. The property also has: Japanese & European barberry, Oriental bittersweet, burningbush, common buckthorn, multiflora rose, honeysuckle, autumn-olive, and Norway maple.
- 6) Control relies on a mixed treatment strategy, with ongoing efforts.
- 7) Control of invasives on abutting properties is an important factor.

Key to Invasive Plant Areas

Infestation Level	Estimated Stems/Acre	Acres
Gray – Mostly Free	0 - 10±	19.7±
Green – Light	10 – 500±	36.6±
Orange – Moderate	500 – 5,000±	17.6±
Red – Severe	5,000 – 20,000+	13.2±

Approx. Acres
Vol.

Map researched and drawn by:
Charlie Moreno, Consulting Forester
Moreno Forestry Associates
Center Strafford, NH
(603) 335-1961 November 2015

Map references:

Town of Durham Tax Maps
NH DOT Orthophotography (2010). Supplied by Strafford County Regional Planning Commission.
“Sketch Map of Doe Farm” (Moreno, January 2000)
Field Examination (Moreno Forestry Associates, 2015)

This map is not intended as a legal description or for legal purposes. Property lines, acreages, and interior details are approximate.

Trails, Bridges, and interpretive Information

Ellen toured Doe Farm with trails consultant Lew Shelley in May 2018. We discussed several needed trail improvements, which include new bridges, brushing back trails, removing dilapidated bog bridges, and creating new trail segments. The trail network is accessible for hiking, x-country skiing, snowshoeing, running, and mountain biking. The Durham Rowing Club grooms a section of the trail for skate skiing in good snow years; this trail connects to a loop on the LaRoche Farm. Trail improvements are needed to allow the groomer to cross a wet section of trail (See trail map on page 4).

Next Steps:

- Work with DPW in September 2018 to remove logs across old stone bridge. Assess need for new bridging, either pressure-treated (PT) wood or more stone. Design and build new bridge.
- Brush cut/mow entire length of the “groomed trail”; this will be needed 2x per year.
- With volunteers, build new PT bridges to cross several short sections of trails that dip or cross wet areas.
- Remove dilapidated bog bridge across wetland between upper loop trail and the groomed trail.
- Evaluate campsite that has historically been used by Boy Scouts in exchange for some stewardship. Consider whether camping is a sustainable use; if so, develop more comprehensive camping rules, such as who, when, what conditions. See discussion below under Moat Island regarding camping and campfires.
- Lay out new sections of trails.
- Install kiosk near gated entrance
- Add interpretive information to kiosk, including trail map and allowed and prohibited uses
- Install property boundary signs
- Install sign at trail terminus near railroad crossing over Lamprey River
- Install “danger” sign at parking lot near RR entrance

Historical Resource Interpretation and Cemetery Maintenance

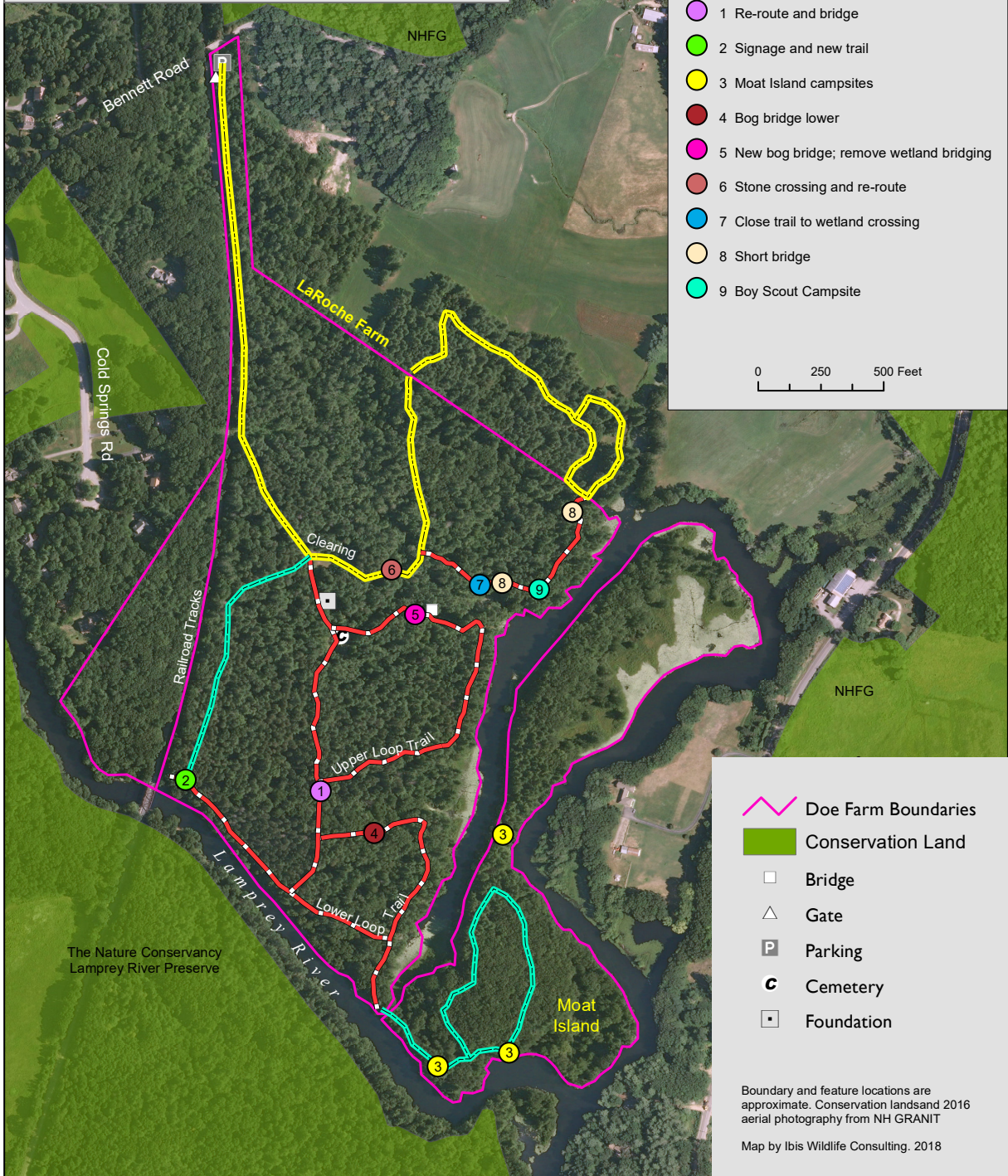
The DPW periodically mows the entrance road, clearing, and the Doe cemetery. A fallen tree near the cemetery has prevented mowing in recent years, allowing vegetation, including invasive plants, to grow up around the cemetery. We consulted with the State Archaeologist Richard Boisvert. He provided the following guidance: “RSA 289:3 III states: *no new construction, excavation, or building shall be conducted within 25 feet of a known burial site or within 25 feet of the boundaries of an established burial ground or cemetery.* Clearing trees and brush, so long as there is no ground disturbance or impacts on the fence, headstones, burials, etc., is acceptable. Signage and trails are a double edged sword, they often attracts looters and vandals, especially when they think there is a bottle dump nearby. Adding these facilities should be done with careful consideration with the protection of the cemetery and archaeological resources in mind. It seems to me that a more comprehensive management plan could be developed with the assistance of qualified archaeologist. This would encompass not only the known features but take into account other cultural resources likely to be present.”

Next Steps:

- Remove fallen tree from edge of cemetery then brush cut the area so that DPW can resume mowing around the cemetery periodically.
- Determine type of interpretive information related to historic Doe cemetery and foundation to include on the kiosk.

Doe Farm Stewardship Map

Durham, NH



Moat Island

Moat Island is approximately 15 acres and is connected to the main section of Doe Farm by a land bridge along the Lamprey River. During high water this connection is typically underwater. The island vegetation includes floodplain forest and alluvial thickets around the edge and oak-pine upland forest in the interior. Invasive buckthorn is present, but at low density. Currently there are no established trails on Moat Island, mainly due to accessibility. The southern end of Moat Island is very popular with boaters on the Lamprey River. Several major campsites with campfires are present in two locations, as well as several smaller tent sites and a couple trash dumps. During July 4th weekend this year, people were setting off major fireworks from one of the campsites. See photos on page 7.

Ellen contacted the Lamprey River Advisory Committee (LRAC) and the National Park Service (NPS) about camping, campfires, and trees in the Lamprey River. Jim MacCartney, the NPS staff person for the Lamprey Wild & Scenic River, provided guidance on how to handle these issues. We discussed the difficulty in the Town managing campsites, given issues of latrines, firewood collecting, patrolling, and related management issues. He suggested that a day use picnic area is more sustainable and favorable. Fire pits are a problem as no way to control use and collecting firewood from the island is not desirable. He recommends a “leave no trace” policy, so just picnicking and no fires. These same issues apply to the “Boy Scout” campsite in the mainland. Based on this discussion and current conditions, the following are recommended.

Next Steps:

- Clean-up all the campsites and trash dumps on Moat Island and on the mainland. For Moat Island, this is best done with volunteers with access to flat bottom boats. All signs of camping and campfires should be removed. Jim MacCartney suggested a weekly patrol of these sites as continuous cleanup will be required for some time until people get the message that camping and campfires are not allowed.
- Designate one to two areas as shown on map as day use picnic areas. Build and place a picnic table at each site. Install signs from the river access that describes allowed and prohibited uses.
- Create a new trail that loops through the southern end of Moat Island (leave north end as a natural area). A trail will increase visitation, which tends to reduce unwanted activities.
- Install property boundary signs.

Fallen Trees in Lamprey River

At the July Conservation Commission meeting, member Coleen Fuerst raised the issue of large trees that have fallen in the Lamprey River, which cause some barrier to boaters, especially scullers who row backwards. Ellen researched the issue, contacting the NPS (Jim MacCartney) and the NH DES Rivers Program. Both spoke about the importance of “large woody material” in rivers, and said that ideally trees that fall in the river are not removed. Attached with this memo is a fact sheet from NH DES: *Managing Large Woody Material in Rivers and Streams*. The fact sheet says: “Removing LWM from a river or stream should only be performed if it poses an imminent threat to human health, human safety, river integrity or public infrastructure, e.g., a blocked stream crossing.” Jim MacCartney recommended that if one-third of a channel is still open that trees should be left in place. If it is desirable to remove some of a fallen tree he recommended that it be trimmed back safely, but that most of the tree be left in the river. Removing a tree requires big machinery on-shore and should not cause any bank erosion nor disrupt the river bottom.

Next Steps:

- Via boat, conduct a reconnaissance of the river along Doe Farm, including Moat Island, to map and assess location of fallen trees. Determine what portion of the river is blocked by each tree and whether a trimming back is feasible with handsaws from a boat and if best solution.

Doe Farm Stewardship Budget Estimates (DRAFT 1 August 2018)					
	Timeline	Amount	Contractor/Vendor	Funding Source	Completed
INVASIVE PLANT CONTROL					
Year 1 spring cutting	2016	\$12,284	TurfPro (Bill Price)	Durham TA Contingency Fund	Yes
Year 1 fall herbicide	2016		TurfPro (Bill Price)	Durham TA Contingency Fund	Yes
Year 2 summer cutting	2018	\$4,000	TurfPro (Bill Price)	Patron's Fund & Land Use Fund	Yes
Year 2 hand pulling of seedlings	Fall 2018	\$500	contractor		
Year 3 spring herbicide	2019	\$9,000	contractor		
Year 3 hand pulling of seedlings	2019	\$5,000	summer intern to assist LSC with all conservation areas		
TOTAL FUNDING NEEDED		\$14,500			
TRAILS AND BRIDGES					
Trail re-route and build bridge (lower tier); pressure treated (PT); granite slab abutments	Fall 2018 or 2019	\$1,000	Volunteers		
Removal of bog bridges in wetland	Fall 2018	\$300	DPW or Contractor		
Improve trail crossing of wet area from clearing east (x-country groom trail) and re-route short segment; remove timbers; build up bridge as needed with PT or rock	Fall 2018	\$1,000	DPW and Volunteers		
Install bridges across short trail dips/wet areas	Fall 2018	\$500	Volunteers		
Update trail map	Fall 2018		Land Stewardship Coordinator	in-kind	
Clean-up Moat Island	Fall 2018		Volunteers	in-kind	
New Mainland	Fall 2018		Volunteers	in-kind	
New Moat Island Trail	Fall 2018		Volunteers	in-kind	
TOTAL FUNDING NEEDED		\$2,800			
INTERPRETIVE SIGNS, KIOSK, HISTORIC SITE MAINTENANCE					
Remove tree and mow around cemetery	Summer/Fall 2018		DPW	in-kind	
Entrance sign: printing	2019	\$300	Portsmouth Sign		
Kiosk: build	2019	\$1,900	Contractor or Scouts		
Interpretive panels - kiosk: design and printing	2019	\$1,500	Contractor or LSC		
Trail markers: printing	2019	\$500	Portsmouth Sign or VOSS		
Boundary signs: printing	2018 or 2019	\$735	for all conservation areas		
Moat Island signage: printing	2019	\$500	contractor; design by LSC		
Moat Island picnic tables	2019		Eagle Scouts?		
TOTAL FUNDING NEEDED		\$5,435			
ANNUAL MAINTENANCE					
Rotary mow upper ski trail	2-3x per summer	\$500	Contractor or DPW		
Clearing and cemetery mowing	During summer		DPW	in-kind	
Downed tree removal (large trees)	As needed		DPW	in-kind	
Parking lot plowing	Winter		DPW	in-kind	
Winter x-country trail grooming	Winter		Durham Rowing Club	in-kind	
Moat Island Clean-ups	As needed		Volunteers	in-kind	
Brush back foot trails	During summer		Volunteers/Interns	in-kind	
TOTAL FUNDING NEEDED		\$500			



Doe Farm-Moat Island Campsite 1



Doe Farm-Moat Island Campsite 1



Doe Farm-Moat Island Campsite 2



Doe Farm-Moat Island Campsite 3



Doe Farm-Mainland "Boy Scout" campsite