Restoration Notes

A. Typical Stream Crossing Restoration without Existing Trail/Road

1. Following the removal of equipment bridges, timber mats, and construction debris, waterbody banks will be restored to preconstruction contours.

2. In all areas of ground disturbance a permanent cover crop of native annual and perennial seed mixes will be used to establish immediate soil stabilization. All seed mixes must be approved by the NH Natural Heritage Bureau.

3. Following seeding, a layer of weed-free straw mulch will be applied to all seeded areas. Mulch will be anchored to prevent displacement by surface water flow or wind erosion. No hay will be permitted.

4. Temporary erosion control blankets and silt fence will be used on and at the base of slopes greater than 8 percent. Permanent slope breakers and water diversions will also be installed and maintained.

5. Live stakes will be installed in late fall or early spring during the dormant season (following September 15 or before June 1) at a rate of 500 shrubs per acre along restored stream banks as shown on the detail sheets (to be developed).

6. Riverbank and stream bank stabilization areas shall have at least 75% successful establishment of wetlands vegetation after two (2) growing seasons, or shall be replanted and re-established in a manner satisfactory to DES.

7. Temporary erosion control materials will be removed following vegetation establishment.

B. Typical Stream Crossing Restoration with Existing Trail/Road

1. For stream crossings in areas with existing improved and unimproved roads that the landowner intends to retain, all road surfaces will be re-contoured to pre-construction grades, with all ruts and potholes filled and smoothed. Where necessary, road fill will be compacted in 6-inch lifts to established pre-construction contours. If requested by the landowner, existing access roads may be removed, and original stream bed and bank contours restored.

2. In all areas where ground disturbance has occurred, final grading, seeding, mulching, and planting will occur as outlined in Section A. above.

C. Typical Depressional Wetland Crossing Restoration

1. Following the removal of timber mats and construction debris, wetland contours, including microtopographic relief, will be restored to preconstruction conditions.

2. Establishment of preconstruction contours may require soil de-compaction through tilling in areas where the use of timber mats and machinery result in soil compaction during the construction phase. In areas of severe soil compaction, or in areas where topsoil and subsoil separation was not achieved, the use of a wetland soil mix may be required to establish pre-construction contours and soil organic content.

3. Additionally, coarse wood debris will be preserved in the wetland or replaced during the restoration process as long as it will not interfere with ROW maintenance.

4. In all areas of ground disturbance, a permanent cover crop of native annual and perennial seed mixes will be used to establish immediate soil stabilization. All seed mixes must be approved by the NH Natural Heritage Bureau.

5. Following seeding a layer of straw mulch will be applied to all seeded areas. Use of hay will not be permitted. Mulch will be anchored to prevent displacement by surface water flow or wind erosion. Temporary erosion control blankets and silt fence will be used on and at the base of slopes greater than 8 percent, and where determined to be necessary. Permanent slope breakers and water diversions will also be installed and maintained. Live stakes of native shrubs will be installed in late fall or early spring during the dormant season (following September 15 or prior to June 1) at a rate of 100 shrubs per acre along restored wetland edges and within wetlands, when feasible.

6. Wetland restoration areas shall have at least 75% successful establishment of wetlands vegetation after two (2) growing seasons, or shall be replanted and re-established in a manner satisfactory to DES.

D. Seepage Slope Wetland Crossing Restoration

1. Where seepage slope wetlands are crossed, the path will be restored by adding (or replacing stockpiled) wetland soil mix to the disturbed area so it matches the surrounding topography and pre-construction contours.

2. Newly placed wetland soil will be seeded with a wetland seed mix approved by the NH Natural Heritage Bureau.

3. Erosion control blankets will be placed over the disturbed and seeded area to hold soil in place until vegetation has become established.

4. Restoration areas shall have at least 75% successful establishment of wetlands vegetation after two (2) growing seasons, or they shall be replanted and re-established until a functional wetland is replicated in a manner satisfactory to the DES Wetlands Program.

E. Wetland Swale Crossing Restoration

1. Following the removal of equipment bridges, timber mats, and construction debris, wetland swale bed and banks will be restored to preconstruction contours.

2. In all areas of ground disturbance a permanent cover crop of native annual and perennial seed mixes will be used to establish immediate soil stabilization. All seed mixes must be approved by the NH Natural Heritage Bureau.

3. Following seeding a layer of straw mulch will be applied to all seeded areas. Use of hay will not be permitted. Mulch will be anchored to prevent displacement by surface water flow or wind erosion. Temporary erosion control blankets and silt fence will be used on and at the base of slopes greater than 8 percent.

4. Restoration of temporary impact areas shall have at least 75% successful establishment of wetlands vegetation after two (2) growing seasons, or they shall be replanted and re-established until a functional wetland is replicated in a manner satisfactory to the DES Wetlands Program.

5. Temporary erosion control materials will be removed following vegetation establishment.

F. Wetland Crossing Restoration with Existing Trail/Road

1. For wetland crossings in areas with existing improved and unimproved roads all road surfaces will be re-contoured to pre-construction grades, with all ruts and potholes filled and smoothed.

2. If requested by the landowner, existing access roads may be removed, and wetland contours restored to grades and microtopograpy similar to portions of the wetland not previously impacted by anthropogenic disturbances.

3. In all areas where ground disturbance has occurred, final grading, seeding, mulching, and planting will occur as outlined in Section C. above.

Restoration Table

Common Name	Genus	Species	Status	Spacing	Installation Method	Alignement
Speckled alder	*Alnus*	*incana*	FACW	3-6 feet	Live stake or cutting	N/S
Black chokeberry	*Aronia*	*melanocarpa*	FAC	3-6 feet	Cutting	N/S
Common buttonbush	*Cephalanthus*	*occidentalis*	OBL	3-6 feet	Live state or Live Pole	N/S
Heart-leaved willow	*Salix*	*eriocephala*	FACW	3-6 feet	Live stake or Live Pole	N/S
Long-beaked willow	*Salix*	*bebbiana*	FACW	3-6 feet	Live stake or Live Pole	N/S
Black willow	*Salix*	*nigra*	OBL	3-6 feet	Live stake or Live Pole	N/S
Silky willow	*Salix*	*sericea*	OBL	3-6 feet	Live stake or Live Pole	N/S
Black elderberry	*Sambucus*	*nigra*	FACW	2-8 feet	Live stake or cutting	N/S
White meadowsweet	*Spiraea*	*alba*	FACW	2-8 feet	Live stake or cutting	N/S
Steeplebush	*Spiraea*	*tomentosa*	FACW	2-8 feet	Live stake or cutting	N/S
Red-osier dogwood	*Swida*	*sericea*	FACW	3-6 feet	Live stake or Live Pole	N
Silky dogwood	*Swida*	*amomum*	FACW	3-6 feet	Live stake or Live Pole	S
Gray dogwood	*Swida*	*racemosa*	FAC	3-6 feet	Live stake or Live Pole	S
Smooth arrowwood	*Viburnum*	*dentatum*	FAC	2-8 feet	Live stake or cutting	N/S
Nannyberry	*Viburnum*	*lentago*	FAC	2-8 feet	Live stake or cutting	N/S
Highbush-cranberry	*Viburnum*	*opulus*	FACW	2-8 feet	Live stake or cutting	N/S
Riparian Seed Mix (per approval by NHNHB; seed at supplier spec. rate)					hydro-seed, mech. spreader, broadcast	N/S
Wetland Seed Mix (per approval by NHNHB; seed at supplier spec. rate)					hydro-seed, mech. spreader, broadcast	N/S
Permanent Upland Seed Mix (per approval by NHNHB; seed at supplier spec. rate)					hydro-seed, mech. spreader, broadcast	N/S
Temporary Upland Seed Mix					hydro-seed, mech. spreader, broadcast	N/S

Note 1: N refers to WMNF and points north; S refers to south of the WMNF

Standing Water Construction Notes

- The contractor will evaluate opportunities to access pond construction locations from public roads on opposite sides of the waterbody to reduce impacts, where safety, weather, seasonal conditions, schedule and structure type allow.
- Work in ponds will take place in winter under frozen conditions to the extent that the construction schedule allows. As necessary, the contractor will enhance frozen conditions by:
  - Removal (plowing) of insulating snowpack from underlying ice;
  - Application of water to plowed icy areas to strengthen ice; and
  - Use of timber matting over ice or deep snow.
- Access in or through ponded locations will follow existing access road and/or ORV trail crossing sites that have been previously disturbed and may have hardened bottoms where possible.
- Access and construction pads in ponded locations may include bridging, stacking timber matting in shallow water to achieve the stability needed, and shallow water work barges where needed.
- If stacking timber mats in ponds, they will be stacked in a manner that includes gaps for movement of aquatic animals through the mats.

THE NORTHERN PASS

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2/19/16

NHDES Wetlands & US Army Corps of Engineers Section 404/10 Permit Application Plans

THE NORTHERN PASS PROPOSED ROUTE

Wetland Restoration Notes/Standing Water Construction Notes

Date: 1/24/2017