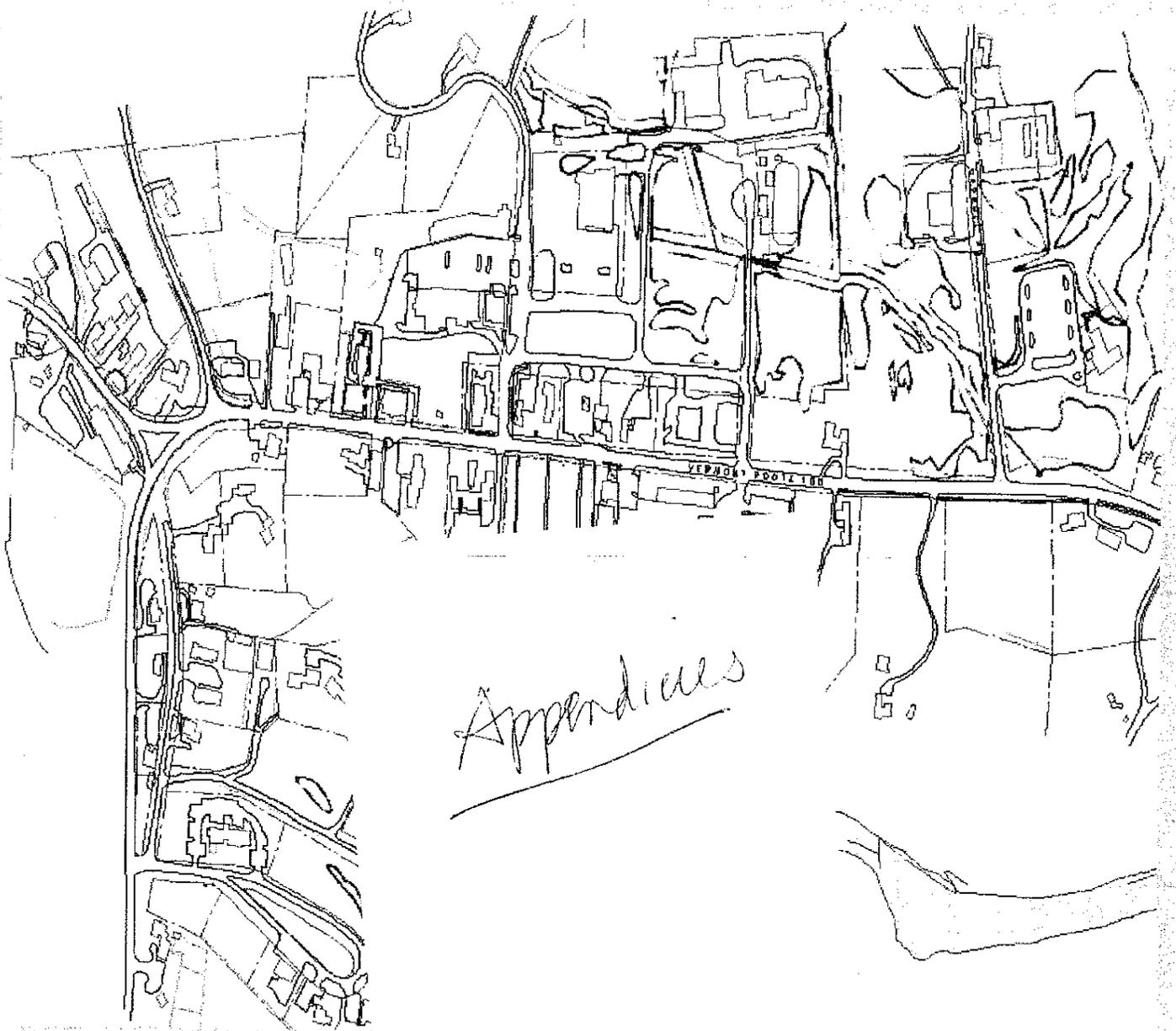


Appendix A:
Irasville Growth Center Wetland Functional Evaluation

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Irasville Growth Center Wetland Functional Evaluation

Introduction

The Irasville Growth Center area contains several types of wetlands determined by landscape position, hydrology, soils, and vegetative cover. These wetlands were divided into six "types" to allow a more accurate and location-specific functional evaluation. These wetland types were classified according to *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin, L.M., et al, Dec. 1979).

Several wetland functional evaluation methods applicable to this portion of New England were used:

- *Vermont Wetland Rules*
- *US Army Corps of Engineers Highway Methodology*
- *Method for the Comparative Evaluation of Nontidal Wetlands in New Hampshire*

What follows is a discussion of each of the six wetland types and the functions they are likely to provide. See the attached Wetland Classification Map for the approximate locations of each of the wetland types.

Wetland Type #1

Wetland Meadow

Palustrine/Emergent/Seasonally Saturated

Wetland Description: This is the major wetland type in the Irasville Growth Center area. The wetlands are formed on glacial till with shallow hardpan and receive groundwater drainage and surface water run-off from the steeper slopes to the northwest. Soil saturation typically occurs only in the Spring; during the rest of the year, the water table is well below the surface. These wetlands are dominated by grasses, forbs, sedges, and rushes. Most of the wetlands included in this type are currently, or were formerly, hay fields.

Functional Evaluation:

1. **Water storage for flood water and storm runoff:** Without depressions capable of retaining a significant amount of run-off, and not associated with streams, these wetlands do not provide this function (the portions of wetlands bordering the intermittent streams are addressed in Riparian Wetlands).
2. **Surface and ground water protection:** Having a dense cover of herbaceous vegetation, this wetland type is capable of providing this function where run-off from roads or parking lots is received. The time of contact between stormwater run-off and wetland vegetation is, however,

limited due to the sloping topography and the inability of this wetland type to hold onto water before it continues downslope. It is, therefore, not as functional as a densely vegetated upland that would have a higher capacity to absorb water.

3. Fisheries habitat: This wetland type does not provide surface water of sufficient depth and duration to support fish habitat. It does not provide this function.

4. Wildlife and migratory bird habitat: This wetland type's ability to provide this function is limited by its lack of structural diversity and wildlife cover. It does not provide this function to a significant degree unless located near other complimentary wetland or upland cover types.

5. Hydrophytic vegetation habitat: This wetland type has no plant species or communities that are locally rare or unique. It does not provide this function.

6. Threatened and endangered species habitat: No threatened or endangered species are known to occur in these wetlands.

7. Education and research in natural sciences: This wetland type has no special features that would make it attractive for education or research.

8. Recreational value and economic benefit: There is no evidence of recreational use of these wetlands and they possess no features attractive for recreation.

9. Open space and aesthetics: This wetland type is not a distinctive landscape feature and does not possess plants that are generally appreciated for their flowers or foliage. It does not provide this function.

10. Erosion control through binding and stabilizing the soil: This wetland type does not occur along a waterbody or watercourse with erosive currents. It does not provide this function.

Functional Evaluation Summary:

2. Surface and ground water protection (limited)
4. Wildlife and migratory bird habitat (limited)

Wetland Type #2

Forested Wetland

Palustrine/Forested/Seasonally Saturated

Wetland Description: Forested Wetlands are found along the escarpment of a river terrace on the southeast side of Route 100. This wetland type occurs at the toe of slope and on the escarpment face where groundwater seeps create wetland conditions.

Functional Evaluation:

1. **Water storage for flood water and storm runoff:** Without depressions capable of retaining a significant amount of run-off, and not associated with streams, these wetlands do not provide this function.
2. **Surface and ground water protection:** Having a dense cover of woody vegetation, this

wetland type is capable of providing this function where run-off from roads or parking lots is received. The time of contact between stormwater run-off and wetland vegetation is, however, limited due to the sloping topography and the inability of this wetland type to hold onto water before it continues downslope.

3. **Fisheries habitat:** This wetland type does not provide surface water of sufficient depth and duration to support fish habitat.

4. **Wildlife and migratory bird habitat:** This wetland type is likely to provide habitat for smaller wildlife species, as long as the species' other habitat needs are met nearby. It provides this function.

5. **Hydrophytic vegetation habitat:** This wetland type has no plant species or communities that are locally rare or unique. It does not provide this function.

6. **Threatened and endangered species habitat:** No threatened or endangered species are known to occur in these wetlands.

7. **Education and research in natural sciences:** This wetland type has no special features that would make it attractive for education or research.

8. **Recreational value and economic benefit:** There is no evidence of recreational use of this wetland type. It does not provide this function.

9. **Open space and aesthetics:** The Forested Wetlands contrast with the surrounding landscape and extend up the escarpment far enough to provide a backdrop to one of the existing commercial developments. They provide this function.

10. **Erosion control through binding and stabilizing the soil:** This wetland type does not occur along a waterbody or watercourse with erosive currents. It does not provide this function.

Functional Evaluation Summary:

2. Surface and ground water protection (limited)
4. Wildlife and migratory bird habitat
9. Open space and aesthetics

Wetland Type #3

Riparian Wetland

Palustrine/Emergent/Seasonally Saturated (portions Temporarily Flooded)

Wetland Description: Several small intermittent streams flow through the Irasville Growth Center area. Riparian Wetlands are distinct from the Wetland Meadows because of their relationship to these streams. The Riparian Wetlands are vegetated by grasses, forbs, sedges, rushes, and sometimes trees and shrubs. For the purposes of this evaluation, this type includes an up to 50-foot wide wetland corridor centered on the intermittent streams. Exceptions to this include the narrow band of wetlands around the shore of the Detention Pond and the wetlands adjacent to the larger stream at the north end of the Growth Center. Please refer to the wetland

classification map for specific areas.

Functional Evaluation:

1. ***Water storage for flood water and storm runoff:*** Because this wetland type furnishes area for the spreading of floodwaters, it is capable of reducing the velocity and depth of floodwater in the drainageway. It provides this function.
2. ***Surface and ground water protection:*** Having a dense cover of herbaceous vegetation, this wetland type is capable of providing this function where it receives run-off from roads or parking lots. Because of the proximity to streams, flood conditions may cause the stream to overtop its banks. Under such conditions, the wetlands may reduce stream velocity sufficiently to retain waterborne sediments. As with the Wetland Meadows, the time of contact between stormwater run-off and wetland vegetation is limited due to the sloping topography and the inability of this wetland type to hold onto water before it continues downslope. The wetland type provides this function.
3. ***Fisheries habitat:*** This wetland type does not provide surface water of sufficient depth and duration to support fish habitat. It does not provide this function.
4. ***Wildlife and migratory bird habitat:*** This wetland type's ability to provide this function is limited by its lack of structural diversity and wildlife cover. It does not provide this function to a significant degree unless located near other complimentary wetland or upland cover types.
5. ***Hydrophytic vegetation habitat:*** This wetland type has no plant species or communities that are locally rare or unique. It does not provide this function.
6. ***Threatened and endangered species habitat:*** No threatened or endangered species are known to occur in these wetlands.
7. ***Education and research in natural sciences:*** This wetland type has no special features that would make it attractive for education or research.
8. ***Recreational value and economic benefit:*** There is no evidence of recreational use of these wetlands and they possess no features attractive for recreation.
9. ***Open space and aesthetics:*** Portions of this wetland type are distinctive landscape features in that they support a band of trees and shrubs that mark the stream channel. Its association with, and enhancement of, the stream channel is aesthetically appealing. It provides this function.
10. ***Erosion control through binding and stabilizing the soil:*** This wetland type occurs along small stream channels and, because of dense vegetation, is able to stabilize stream banks and resist erosion. It provides this function.

Functional Evaluation Summary:

1. Water storage for flood water and storm runoff
2. Surface and ground water protection
4. Wildlife and migratory bird habitat (limited)
9. Open space and aesthetics

10. Erosion control through binding and stabilizing the soil

Wetland Type #4

Intermittent Stream

Riverine/Seasonally-Intermittently Flooded

Wetland Description: This wetland type includes the small intermittent streams that flow through the Irasville Growth Center area. These streams originate on the hillside northwest of the Growth Center. On their way across the site, they combine into one main channel before entering the Detention Pond.

Functional Evaluation:

1. **Water storage for flood water and storm runoff:** The stream channel does not provide this function because it lacks vegetation and conducts water quickly across the site. This wetland type does not provide this function.
2. **Surface and ground water protection:** The stream channel does not provide this function because it lacks vegetation and conducts water quickly across the site.
3. **Fisheries habitat:** This wetland type does not provide year-round fish habitat but may provide seasonal habitat for fish that take refuge in the Detention Pond. It provides this function.
4. **Wildlife and migratory bird habitat:** This wetland type is likely to seasonally provide water and food to smaller wildlife species, as long as the species' other habitat needs are met nearby. It provides this function.
5. **Hydrophytic vegetation habitat:** This wetland type has no plant species or communities that are locally rare or unique. It does not provide this function.
6. **Threatened and endangered species habitat:** No threatened or endangered species are known to occur in these wetlands.
7. **Education and research in natural sciences:** The streams contain open water and aquatic organisms and may be of some use as an educational resource. Safe, off-road parking is available nearby. This wetland type provides this function.
8. **Recreational value and economic benefit:** There is no evidence of recreational use of the streams. They are much too small for water-based recreation. The streams do not provide this function.
9. **Open space and aesthetics:** The stream are aesthetically appealing by virtue of flowing water. They provide this function.
10. **Erosion control through binding and stabilizing the soil:** Without vegetation, the streams do not exhibit this function. It is the riparian wetlands that would be function to stabilize the stream banks.

Functional Evaluation Summary:

3. Fisheries habitat (limited)
4. Wildlife and migratory bird habitat (limited)
7. Education and research in natural sciences
9. Open space and aesthetics

Wetland Type #5

Marsh/Shrub Swamp

Palustrine/Emergent-Scrub Shrub/Saturated and Semi-Permanently Inundated

Wetland Description: This wetland type is limited to one location between the river terrace escarpment and the Mad River. Please refer to the wetland classification map for its location. It is dominated by cattails and alders. Its source of water is run-off and groundwater seeps. Water flows from this wetland to the Mad River through two narrow ditches.

Functional Evaluation:

1. **Water storage for flood water and storm runoff:** The wetland provides this function because it has a restricted outlet and receives run-off from developed areas.
2. **Surface and ground water protection:** The wetland receives run-off from a parking lot and Route 100. It has dense vegetation and a restricted outlet, offering extended detention. It provides this function.
3. **Fisheries habitat:** This wetland does not provide surface water of sufficient depth and duration to support fish habitat. It does not provide this function.
4. **Wildlife and migratory bird habitat:** This wetland is located between the Mad River and forested wetlands. The juxtaposition of different wetland types and the river is likely to provide wildlife habitat.
5. **Hydrophytic vegetation habitat:** This wetland is not known to contain plant species or communities that are locally rare or unique. It does not provide this function.
6. **Threatened and endangered species habitat:** No threatened or endangered species are known to occur in this wetland.
7. **Education and research in natural sciences:** The wetland may be of interest for educational use. Safe, off-road parking is available nearby. The wetland provides this function.
8. **Recreational value and economic benefit:** There is no evidence of recreational use of these wetlands and they possess no features attractive for recreation.
9. **Open space and aesthetics:** The wetland contrasts with the river and the forest on the adjacent escarpment. It provides this function.
10. **Erosion control through binding and stabilizing the soil:** This wetland type does not occur along a waterbody or watercourse with erosive currents. It does not provide this function.

Functional Evaluation Summary:

1. Water storage for flood water and storm runoff
2. Water Quality Improvement
4. Wildlife and migratory bird habitat
7. Education and research in natural sciences
9. Open space and aesthetics.

Wetland Type #6

Detention Pond

Palustrine/Open Water/Permanently Inundated

Wetland Description: This wetland type includes the pond between the cinema and Route 100. It is an artificial pond constructed to detain stormwater run-off from the developed portions of Irasville. Much of the drainage from the Irasville Growth Center northwest of Route 100 flows through this pond. At the northern end of the pond, a berm holds back water while an outlet structure controls the level of the pond and the rate of water release. The pond has emergent vegetation around the shoreline and near the inlet where sediment has been deposited.

Functional Evaluation:

1. **Water storage for flood water and storm runoff:** The pond provides this function because it has flood storage capacity above its normal water level.
2. **Surface and ground water protection:** The pond provides this function by detaining stormwater and retaining sediment.
3. **Fisheries habitat:** Because of permanent open water with sufficient unfrozen depth in the winter, the pond is able to support small fish.
4. **Wildlife and migratory bird habitat:** The pond may be able to provide limited resting and feeding habitat to waterfowl. Its ability to provide wildlife habitat is limited due to its proximity to Route 100, Carroll Road, and the Cinema. It provides this function to a limited extent.
5. **Hydrophytic vegetation habitat:** This pond has no plant species or communities that are locally rare or unique. It does not provide this function.
6. **Threatened and endangered species habitat:** No threatened or endangered species are known to occur in the pond.
7. **Education and research in natural sciences:** The pond contains open water and aquatic organisms and may be of some use as an educational resource. Safe, off-road parking is available nearby. The pond provides this function.
8. **Recreational value and economic benefit:** The pond is too small to provide for typical water-based recreational activities. However, it is occasionally used by a local outfitter for demonstration and practicing of kayaking techniques.
9. **Open space and aesthetics:** The pond is a very visible open water feature. Although not surrounded by especially scenic landscape, there are few negatives associated with the pond

itself. It provides this function.

10. *Erosion control through binding and stabilizing the soil:* This wetland type includes only the pond. There is a narrow band of palustrine wetland around the shore of the pond, but this is addressed under riparian wetlands. The pond does not provide this function.

Functional Evaluation Summary:

1. Water storage for flood water and storm runoff
2. Surface and ground water protection
3. Fisheries habitat
4. Wildlife and migratory bird habitat (limited)
7. Education and research in natural sciences
8. Recreational value and economic benefit (limited)
9. Open space and aesthetics

Summary of Wetland Functions

Wetland Functions	Wetland Types					
	1	2	3	4	5	6
1. Water storage for flood water and storm runoff			✓		✓	✓
2. Surface and ground water protection	✓	✓	✓		✓	✓
3. Fisheries habitat				✓		✓
4. Wildlife and migratory bird habitat	✓	✓	✓	✓	✓	✓
5. Hydrophytic vegetation habitat						
6. Threatened and endangered species habitat						
7. Education and research in natural sciences				✓	✓	✓
8. Recreational value and economic benefit						✓
9. Open space and aesthetics			✓	✓	✓	✓
10. Erosion control through binding and stabilizing the soil			✓			

- ✓ = Provides the function
- ✓ = Ability to provide function is limited or qualified (see discussion)

Wetland Types

- 1. Wetland Meadow
- 2. Forested Wetland
- 3. Riparian Wetland
- 4. Intermittent Stream
- 5. Marsh/Shrub Swamp
- 6. Detention Pond

Conclusions

The wetlands occurring in the Irasville Growth Center were classified into six functional types based on hydrology, vegetation type, position on the landscape, and relationship to other landscape features. Their ability to provide any of the ten wetland functions recognized by the State of Vermont Wetland Rules was evaluated.

The Detention Pond near Route 100 at the north end of the Growth Center was determined to exhibit the greatest number of functions (7 out of 10) because of its ability to detain and treat stormwater, provide habitat for fish and possibly other species of wildlife, and to provide an aesthetically pleasing landscape feature and occasional recreation resource.

The Riparian Wetlands and Intermittent Streams were determined to provide 5 out of 10 and 4 out of 10 functions, respectively. Taken as one system, they provide 7 out of 10 functions. This is due to the presence of significant surface water, the ability to handle and treat surface water on its way downstream, and the aesthetically pleasing nature of flowing water.

The Marsh/Shrub Swamp was determined to provide a fair number of functions (5 out of 10) because of its relatively remote location, lower level of disturbance, and relationship to other wetland types as well as the Mad River.

The Wetland Meadows were determined to provide the fewest functions. This is due in large part to landscape position, hydrology, and land use. The functions provided by this wetland type are similar to those provided by upland meadows.

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Irasville Growth Center Wetland Classification Map

Note:
Wetlands to the north of Route 100 were field delineated and surveyed in the Summer of 1998. Wetlands shown to the south of Route 100 are based on field reconnaissance and may not represent all wetlands in this area or be accurate as to exact size and location.

