

impact Protected Species is far greater on the Noticed-Alternative Southern Route than for the Preferred Northern Route. Therefore, regarding negative potential impacts to Protected Species and their habitats, the Preferred Northern Route is superior to the Noticed-Alternative Southern Route.

5.3.6.2.4 Mitigation Measures

WMECO and NHESP have discussed the possible construction measures and monitoring that will be required in order to avoid the taking of Protected Species. In areas mapped as potential habitat for Protected Species, these are likely to include:

- The avoidance of impacts to “Eagle Trees” within 300 feet of the Connecticut and Westfield Rivers to ensure no loss of active bald eagle habitat;
- The use of, and rigorous monitoring and maintenance of sedimentation and erosion control measures to prevent water quality impacts to the rare dragonfly, mussel, and fish habitat areas;
- Re-vegetation to the greatest extent practicable within 200 feet of the waterways known to possess the rare dragonfly, mussel, and fish habitat areas;
- Use of low ground pressure equipment (e.g., tracked vs. wheeled vehicles; wheeled vehicles with oversized tires) to the greatest extent practicable;
- Appropriate construction timing to avoid impacts to the Eastern worm snake and Eastern spadefoot toad; and
- The preparation and approval (by NHESP) of a formal “Turtle Protection Plan”, in conjunction with possible construction timing and/or daily “sweeps” of the construction area by an approved biologist, in order to avoid the taking of or injury to the Eastern box turtle and wood turtle.

WMECO anticipates further consultation with NHESP will occur during the next few months in order to formulate a detailed construction and monitoring plan intended to avoid impacts to Protected Species.

5.3.7 Surface Waters

The existing environment and impacts and mitigation measures for the Preferred Northern Route and the Noticed-Alternative Southern Route are in the following subsections.

5.3.7.1 Existing Environment

The existing surface water resources for the Preferred Northern Route and the Noticed-Alternative Southern Route are summarized below.

5.3.7.1.1 Preferred Northern Route

The Project area is located within three different watersheds: the Connecticut River Basin; the Chicopee River Basin, and the Westfield River Basin. The Chicopee River and Westfield River both discharge to the Connecticut River, which is the largest drainage system in New England. The Connecticut River Basin spans 11,263 square miles and includes the States of Vermont, New Hampshire, Massachusetts, and Connecticut. This drainage basin covers approximately 2,728 square miles within Massachusetts and drains all or part of 45 municipalities within the Commonwealth.

A number of streams and rivers are crossed by the Preferred Northern Route and each is listed on the following Table 5-23.

Table 5-23: Watercourses Crossed by the Preferred Northern Route 115-kV and 345-kV Facilities: CT/MA State Border to Ludlow

Town	Series Number and Name (if Applicable)	Water Quality Class	Fisheries Class	Type (P or I)	Popular Name or other Comments
Agawam	S1-1	B	Warm Water	P	
Agawam	S1-2	B	Warm Water	P	
Agawam	S1-3	B	Warm Water	P	Still Brook
Agawam	S1-4	B	Warm Water	P	Philo Brook
Agawam	S1-5	B	Warm Water	P	
Agawam	S1-6	B	Warm Water	P	
Agawam	S1-7	B	Warm Water	P	Tarkill Brook
Agawam	S2-11	B	Warm Water	P	
Agawam	S2-9	B	Warm Water	P	
Agawam	S2-10	B	Warm Water	I	
Agawam	S2-12	B	Warm Water	P	Threemile Brook
Agawam	S2-15	B	Warm Water	P	
Agawam	S2-13	B	Warm Water	I	
Agawam	S3-16, 17	B	Warm Water	P	Westfield River
West Springfield	S3-18	B	Warm Water	P	
Agawam	S3-19	B	Warm Water	P	Silver Stream
West Springfield	S3-20	B	Warm Water	I	
West Springfield	S3-21	B	Warm Water	P	
West Springfield	S3-22	B	Warm Water	P	Piper Brook
West Springfield	S3-23A	B	Warm Water	I	Bagg Brook
West Springfield	S3-23	B	Warm Water	P	Bagg Brook
West Springfield	S3-24	B	Warm Water	I	Goldine Brook
West Springfield	S3-24	B	Warm Water	P	Goldine Brook
West Springfield	S3-25	B	Warm Water	I	Schoolhouse Brook
West Springfield	S3-26	B	Coldwater	P	Schoolhouse Brook
Chicopee	S3-27	B	Warm Water	P	Schoolhouse Brook
Chicopee	S3-28	B	Warm Water	P	Connecticut River
Chicopee	S3-29	B	Warm Water	I	
Chicopee	S3-30	B	Warm Water	P	
Chicopee	S3-30A	N/A	N/A	N/A	Detention Basin
Chicopee	S3-30B	B	Warm Water	P	
Chicopee	S3-30C	B	Warm Water	P	Cooley Brook
Chicopee	S3-30D	N/A	N/A	N/A	Detention Basin
Chicopee	S3-31	B	Coldwater	P	
Ludlow	S3-35	B	Warm Water	I	
Ludlow	S3-36	B	Cold water	P	Fuller Brook
Ludlow	S3-37	B	Cold water	P	Fuller Brook
Ludlow	S3-37A	B	Warm Water	I	
Ludlow	S3-38	B	Cold water	P	Harris Brook
Ludlow	S3-39	B	Warm Water	P	Higher Brook
Ludlow	S3-39A	B	Warm Water	I	

The Massachusetts Surface Water Quality Standards and Classifications at 314 C.M.R. 4.00 designate the waters crossed by the Preferred Northern Route as Class B, High Quality Waters. The Connecticut River

crossed by the Preferred Northern Route is designated as a Class B, Warm Water, CSO (waters identified as impacted by the discharge of combined sewer overflows).

The two largest watercourses crossed by the Preferred Northern Route are the Connecticut River (see: Aerial Mapsheet 8 of 22 in Exhibit 5.2), and the Westfield River (see: Aerial Mapsheet 4 of 22 in Exhibit 5.2). The Connecticut River is the largest river in New England, flowing south from the Connecticut Lakes in northern New Hampshire, along the border between New Hampshire and Vermont, through Western Massachusetts and central Connecticut into Long Island Sound at Old Saybrook, Connecticut. The Connecticut River is a habitat to several species of anadromous fish, including the American shad, American eel, Striped Bass and the Sea lamprey. The Westfield River in Massachusetts flows through Westfield and empties into the Connecticut River at West Springfield, Massachusetts. It has a 497 square mile drainage area consisting of several tributaries. Running for a total of 78.1 miles, the river rises in the Berkshire Hills in the northwest of the state and flows generally southeastwardly to join the Connecticut River at West Springfield.

In addition to the rivers described above, the Preferred Northern Route also crosses perennial streams and intermittent streams. These streams along with their water quality classification, fisheries class, and associated wetlands are listed in Table 5-23, above. The named waterways crossed by or in the vicinity of the Preferred Northern Route include:

- Still Brook (Agawam) (see: Aerial Mapsheet 2 of 3)
- Philo Brook (Agawam) (see: Aerial Mapsheet 2 of 3)
- Tarkill Brook (Agawam) (see: Aerial Mapsheet 3 of 3 and 1 of 22)
- Three Mile Brook (Agawam) (see: Aerial Mapsheet 2 of 22)
- Silver Stream (West Springfield) (see Aerial Mapsheet 4 and 5 of 22)
- Piper Brook (West Springfield) (see: Aerial Mapsheet 5 of 22)
- Bagg Brook (West Springfield) (see: Aerial Mapsheet 6 of 22)
- Goldine Brook (West Springfield) (see: Aerial Mapsheet 6 and 7 of 22)
- Schoolhouse Brook (West Springfield) (see: Aerial Mapsheet 7 and 8 of 22)
- Cooley Brook (Chicopee) (see: Aerial Mapsheet 11 of 22)
- Fuller Brook (Chicopee) (see: Aerial Mapsheet 12, 13, 14, 15, 17, 18 and 21 of 22)
- Harris Brook (Ludlow) (see: Aerial Mapsheet 16 and 17 of 22)
- Higher Brook (Ludlow) (see: Aerial Mapsheet 17 and 18 of 22)
- Mountain Lake Stream (Ludlow) (see: Aerial Mapsheet 20 of 22)

- Poor Brook (Ludlow) (see: Aerial Mapsheet 22 of 22)

No lakes or ponds are traversed by the Preferred Northern Route.

5.3.7.1.2 Noticed-Alternative Southern Route

The Noticed-Alternative Southern Route crosses a number of streams or rivers in Massachusetts. The prominent streams and rivers traversed along the Noticed-Alternative Southern Route include the Connecticut River (described in Section 5.3.7.1.1), Chicopee River (see: Aerial Mapsheet 18 of 20 in Exhibit 5.2), Worthington Brook, (see: Aerial Mapsheet 5 of 20 in Exhibit 5.2) Freshwater Brook (see: Aerial Mapsheet 9 of 20 in Exhibit 5.2) , Watchaug Brook (see: Aerial Mapsheet 11 and 12 of 20 in Exhibit 5.2), the South Branch of the Mill River (see: Aerial Mapsheet 14 of 20 in Exhibit 5.2), and Fuller Brook (see: Aerial Mapsheet 20 of 20 in Exhibit 5.2). In addition to the watercourses listed above, the Noticed-Alternative Southern Route also crosses several perennial and intermittent streams. These streams along with their water quality classification, fisheries class, and associated wetlands are listed in the following Table 5-24.

Table 5-24: Watercourses Traversed by the Noticed-Alternative Southern Route ROW in Massachusetts

Town	Series Number and Name (if Applicable)	Water Quality Class	Fisheries Class	Type (P or I)	Popular Name or other Comments
Agawam	S1-8	B	Warm Water	I	Tarkill Brook
East Longmeadow	S8-58 & S8-58A	B	Warm Water	P	Connecticut River
Agawam	S3-23	B	Warm Water	I	
Agawam	S1-7	B	Warm Water	I	Tarkill Brook
Agawam	S8-55	B	Warm Water	I	Worthington Brook
East Longmeadow	S8-60	B	Warm Water	I	Freshwater Brook
East Longmeadow	S8-61	B	Warm Water	I	
East Longmeadow	S8-62	B	Warm Water	I	
East Longmeadow	S8-63	B	Warm Water	I	
East Longmeadow	S8-64	B	Warm Water	P	Watchaug Brook
East Longmeadow	S8-66	B	Warm Water	P	Watchaug Brook
Hampden	S8-67	B	Warm Water	P	Watchaug Brook
Hampden	S8-68	B	Warm Water	P	Watchaug Brook
Wilbraham	S8-70A	B	Warm Water	P	Mill River
Hampden	S8-69	B	Warm Water	P	Mill River
Wilbraham	S8-70	B	Warm Water	P	Mill River
Wilbraham	S8-71	B	Warm Water	I	
Wilbraham	S8-74	B	Warm Water	I	
Wilbraham	S8-74A	B	Warm Water	I	
Wilbraham	S8-73	B	Warm Water	I	
Ludlow	S8-72	B	Warm Water	P	Chicopee River
Ludlow	S8-75	B	Cold Water	I	
Ludlow	S8-77	B	Cold Water	P	
Ludlow	S3-41	B	Cold Water	P	Fuller Brook
Ludlow	S3-40	B	Cold Water	I	

5.3.7.2 Impacts and Mitigation

The impacts and mitigation for surface water of the Preferred Northern Route and the Noticed-Alternative Southern Route are summarized below.

5.3.7.2.1 Preferred Northern Route and Related Facilities

Potential impacts to surface waters typically stem from erosion and sedimentation into watercourses as a result of soil disturbance and vegetation removal, or from the potential installation of transmission line structures or access roads within watercourses. Because the development of the proposed transmission lines would not create a new corridor across these watercourses and, for the most part, would not involve

in-stream activities, the Project would have limited and short-term overall effects on streams and water quality.

5.3.7.2.2 Noticed-Alternative Southern Route

Potential impacts to streams, rivers, lakes, ponds, or similar surface waters are generally similar to those listed for the Preferred Northern Route. Because the development of the proposed transmission lines would not create a new corridor across these watercourses and, for the most part, would not involve in-stream activities, the Project would have limited and short-term overall effects on streams and water quality.

5.3.7.2.3 Comparison of Surface Waters Impacts

Overall, the quality of surface waters along the Noticed-Alternative Southern Route is higher than those of the Preferred Northern Route, due mainly to the fact the Noticed-Alternative Southern Route is less developed. However, significant impacts to watercourses are not anticipated for either route since the watercourses will in general be spanned. As set forth above in Tables 5-5 and 5-6, approximately 47 crossings of watercourse resources would be affected along the Preferred Northern Route, versus 41 crossings on the Noticed-Alternative Southern Route. In practical terms, based on the foregoing, selection of the Noticed-Alternative Southern Route, without consideration of the 115-kV upgrades on the Preferred Northern Route, would result in fewer crossings of watercourses. However, the watercourses on the Preferred Northern Route would also be crossed for the 115-kV upgrades. As a result, when the total crossings are considered, the Preferred Northern Route is again superior.

5.3.7.2.4 Mitigation Measures

All of the watercourses located along both routes are presently spanned by existing transmission lines, and certain of the smaller stream crossings along these existing ROWs also are traversed by existing utility access roads. Because the development of the proposed transmission lines would not create a new corridor across these watercourses and, for the most part, would not involve in-stream activities, the Project would have limited and short-term overall effects on streams and water quality.

WMECO proposes to avoid direct construction work in watercourses to the extent feasible and to limit the potential for indirect effects associated with erosion, sedimentation or spills into streams and rivers from nearby upland construction activities. The 345-kV transmission lines would span all watercourses. Temporary bridges and construction matting will be used to allow for equipment to cross streams, where

alternative means of access is not available. Use of such materials will eliminate effects to stream banks and stream bottom sediments. At major river and waterbody crossings (such as the Connecticut and Chicopee Rivers), equipment access will be via the ROW or existing roads on either side of the water resource; no in-water work is expected to be required at these large rivers to install the overhead lines as all overhead lines will span the rivers.

Crossings of smaller streams by construction equipment would be minimized to the extent possible. Existing access roads, which already cross these watercourses along the ROWs, would be utilized whenever possible.

Vegetation removal would be minimized within a 25-foot-wide riparian buffer strip along streams. Within this buffer, only the minimum amount of vegetation necessary for the construction and safe operation of the transmission facilities (including the provision of access) would be removed. Vegetation removal near streams would be performed selectively, to preserve desirable streamside vegetation for habitat enhancement, shading, bank stabilization, and erosion/sedimentation control.

Temporary bridges consisting of timber mats (or equivalent) may be used for equipment to cross streams, where alternative means of access is not available. Use of such materials will allow for the avoidance of effect to banks and stream bottom sediments.

However, in general, culverted access roads have historically been installed across the smaller existing watercourses along the ROWs. Prior to construction, integrity inspections of the culverts will be conducted, and culvert structures deemed to either be in disrepair or unable to support the weights of the anticipated construction vehicles would be replaced at the same location and designed to maintain the stream flows. New culverts may be required where no culvert currently exists. These new culverted crossings would be designed and installed in accordance with the USACE and MassDEP guidelines.

WMECO will also implement the following measures to minimize the potential effects of construction activities in or near watercourses:

- Where existing access roads that cross stream bottoms must be improved, clean materials will be used (e.g., clean riprap or equivalent, rock fords). To the extent possible, the improvement of existing access roads across streams that support fishery resources will be scheduled to avoid conflicts with fish spawning/migration.

- Water flows will not be constrained during construction.
- Installation of new culverts at currently day-lighted stream reaches will be avoided.

5.3.8 Drinking Water Supplies

The existing environment and impacts and mitigation measures for the Preferred Northern Route and the Noticed-Alternative Southern are in the following subsections.

5.3.8.1 Existing Environment

The existing drinking water supplies for the Preferred Northern Route and the Noticed-Alternative Southern Route are summarized below.

5.3.8.1.1 Preferred Northern Route

WMECO conducted a MassGIS-based investigation of public drinking water resources data for the GSRP, including:

- Active surface water reservoirs;
- Groundwater community wells;
- Proposed wells;
- Emergency surface water supplies;
- Watershed protection areas (“Public Water Supply Contributors”);
- Outstanding Resource Waters;
- MassDEP Approved Wellhead Protection Areas;
- MassDEP Interim Wellhead Protection Areas; and
- Non-Potential Drinking Water Source Areas

Figure 5-1 depicts these resources.