NEW YORK STATE | Department of Environmental Conservation

Lower Salmon River Restoration and Recreation Enhancement Plan

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A plan for the Lower Salmon River State Forest

located in the

Towns of Orwell, Albion and Richland

Oswego County

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Executive Summary

The scenic Salmon River in northern Oswego County is a tributary to Lake Ontario and home to one of the nation's most intensively used fisheries for trophy-sized trout and salmon. The substantial numbers of mature fish returning to the river and miles of publicly accessible fishing opportunities combine to produce this incredible fishery. The New York State Department of Environmental Conservation's (DEC) Salmon River Fish Hatchery, which produces all of the Pacific salmon and steelhead for New York's Great Lakes stocking program is located near the top end of the Lower Salmon River.

DEC recently acquired approximately 1,700 acres of land adjacent to the Lower Salmon River as the result of a settlement agreement with National Grid (formerly Niagara Mohawk). The purpose of acquiring these lands was to improve and ensure protection of the natural resources and provide public access to the fisheries. In addition to fishing access provided by lands now owned outright, DEC owns public fishing rights along additional sections of the river. In combination, DEC currently provides approximately 14 equivalent river miles of permanent public fishing access along the Salmon River.

The recently acquired lands are now designated as the Lower Salmon River State Forest, and the focus of this management plan. DEC Region 7 Fisheries Unit (Division of Fish and Wildlife) will act as the primary land manager through an interdivisional agreement with the Division of Lands and Forests. Due to intensive use of the area by anglers, there is currently no planned emphasis on harvesting forest products. Area-specific regulations include prohibitions on camping and target practice as well as restrictions on warm season fire use. Snowmobile use will be limited to designated trails.

This plan will address issues of degraded aquatic habitat and unimproved fisheries access. Seasonal hydroelectric project baseflows mandated by the Federal Energy Regulatory Commission license reduced the river's capacity to properly transport bedload, which led to filling in and widening of the river channel and increased bank erosion. Some existing trails are also a concern due to their location and/or erosion issues. The trail system along the river is not formally developed and current trails are the result of anglers repeatedly accessing the river over the years. To address these habitat and access issues, DEC allocated $500,000 of Lake Ontario Sportfishing Restoration Natural Resource Damages funds to river restoration and trail enhancement/ development.

As part of this plan, DEC and United States Fish and Wildlife Service (USFWS) partners developed proposals to construct river restoration structures and new trails. The goals of restoration activities are to develop habitat for fish and other aquatic organisms and improve sediment transport by restoring natural riffle, pool, run sequences in the river, and to stabilize eroding banks. Trail development and enhancement will both facilitate construction activities and improve angler access. As funding allows, additional trails will be built, relocated or otherwise upgraded to improve angler access and better protect the natural resources. The river restoration and trail projects will protect, conserve and enhance this incredible fishery for current and future generations of anglers.

Introduction and Background

The Salmon River is a tributary to Lake Ontario located in northern Oswego County. The focus of this plan is the Lower Salmon River State Forest (LSRSF) which is comprised of approximately 1,700 acres of land adjacent to the lower portion of the Salmon River in the towns of Orwell, Albion and Richland. The lands are located between the lower Lighthouse Hill Reservoir and the Village of Pulaski (Figure 1). These lands represent a portion of 2,825 acres acquired by the New York State Department Environmental Conservation (DEC) through a settlement agreement with National Grid (formerly Niagara Mohawk). A map of all of the lands acquired in the settlement is provided in Appendix 1.

This plan is designed to substitute for the Unit Management Plan (UMP) typically developed for State Forest lands due to the unique and intensive use of the area by anglers. The purpose of acquiring the lands along the Lower Salmon River is to improve and ensure protection of the natural resources and provide public access to the fisheries. Thus, the fisheries are designated as the top priority use for the area and all other recreational uses must be compatible with fishing. In alignment with the UMP process, this plan's purpose is to guide and assist management activities on the Lower Salmon River State Forest (LSRSF) for the next 10 years.

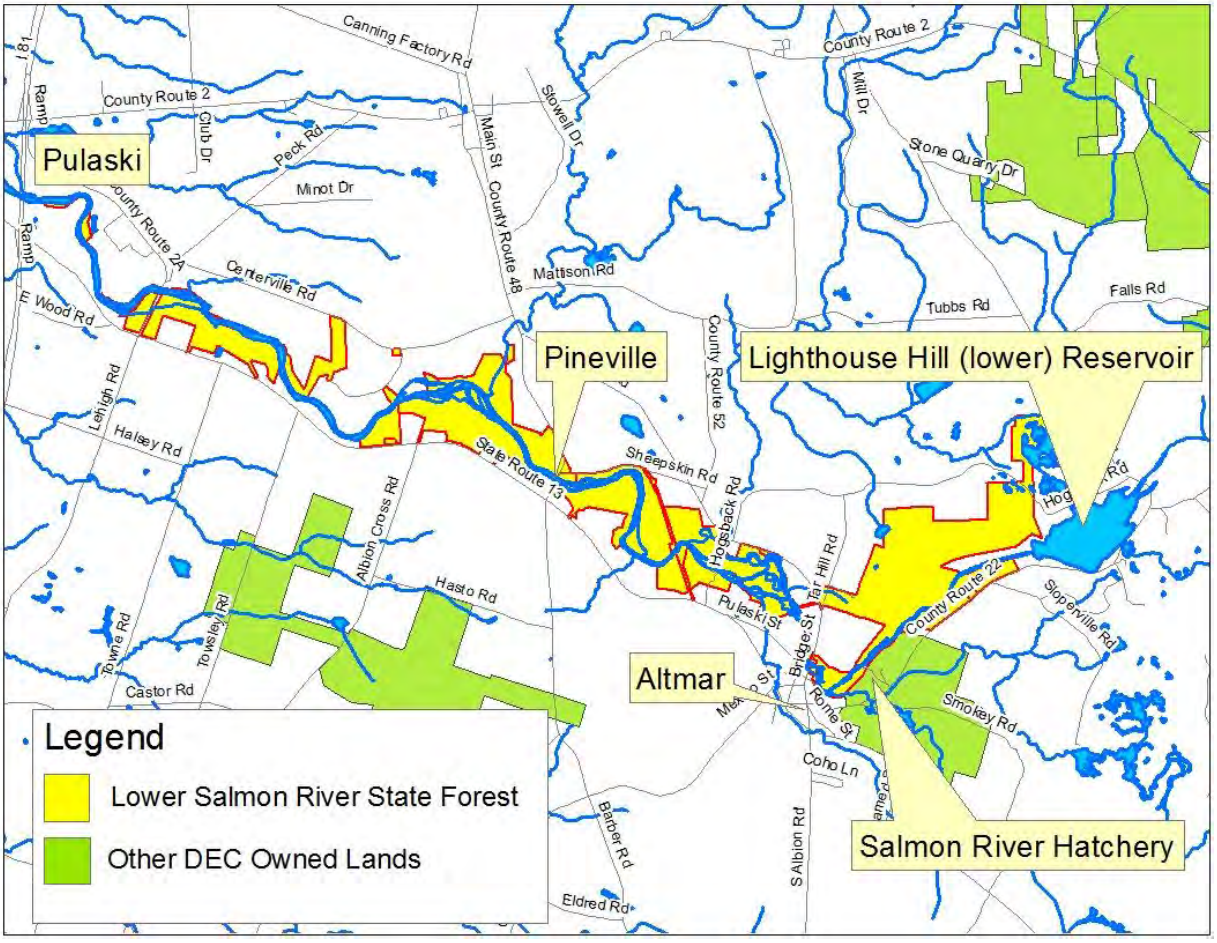

Figure 1. Lands of the Lower Salmon River State Forest and other DEC owned lands.

Remaining parcels are assigned to other State Forests in the area that are covered in other Unit Management Plans. One parcel was assigned to the Eastern Lake Ontario Management Unit, a group of State Forest lands that surround the Lower Salmon River State Forest and the remaining parcels were assigned to the Upper Salmon River Management Unit which lies to the east.

The Lower Salmon River is home to DEC's Salmon River Fish Hatchery which is located near the top end of the Lower Salmon River and provides all of the Pacific salmon (Chinook and Coho) and steelhead for DEC's Great Lakes stocking programs in Lake Ontario and Lake Erie. Approximately 20 percent of the Chinook and Coho salmon and winter run steelhead (Chamber's Creek), about one-half of the landlocked Atlantic salmon, and all summer run steelhead (Skamania) stocked in Lake Ontario are stocked at the Salmon River. The Salmon River supports a world-renowned fishery for these species that mature to adults in the lake and return to the river to spawn.

The Salmon River Fish Hatchery is also a major tourist attraction, hosting tens of thousands of visitors annually. Fall activities at the hatchery commence with annual celebrations of National Hunting and Fishing Day that occurs on the fourth Saturday in September; these events typically draw as many as three thousand visitors. Peak visitation at the hatchery occurs in October during the fall Pacific salmon spawning operations. Large groups of school children visit the hatchery on field trips for tours to learn about hatchery operations and fisheries programs. Many thousands of anglers and people who are interested in viewing fall spawning operations also visit the hatchery. Steelhead spawning operations occur in late March/early April and are also a popular attraction.

The upper Salmon River watershed is comprised of headwaters that drain a portion of the southwestern Tug Hill Plateau, a large upper reservoir (Salmon River or Bennett's Bridge), a bypass between the reservoirs where DEC's Salmon River Falls Unique Area is located, and the smaller Lighthouse Hill lower reservoir. The dam at the lower reservoir is 17 river miles above the mouth of the river, regulates flows in the Lower Salmon River, and is the first impassible barrier that prevents lake-run trout and salmon from moving farther upstream.

Two major tributaries, Trout Brook and Orwell Brook, also drain into the Lower Salmon River from the north. These tributaries receive large contributions from groundwater, making them thermally suitable for natural reproduction of steelhead and Coho salmon, species that require year-round tributary nursery habitat. The main stem of the Lower Salmon River tends to warm too much during summer months to provide year-round nursery habitat. Chinook salmon spawn in the fall, hatch in the spring, and the young move into the lake by the following June, thus avoiding excessively warm summer temperatures in the main stem of the river. Cool water tributary habitat is extremely limited in the Lake Ontario system and vital to protect and conserve.

Although this plan is focused on the Lower Salmon River where fisheries are the overwhelming attraction, other nearby public lands include State Forest lands; the Happy Valley, Little John and Deer Creek Marsh Wildlife Management Areas (WMAs); and

Selkirk Shores State Park. These lands provide a wide variety of attractions and recreational opportunities, including hunting, fishing and trapping, as well as – thanks to 300 inches of average annual snowfall – snowmobiling, cross-country skiing and snowshoeing. These recreational opportunities are a popular draw for tourism and economically important to the surrounding area. Salmon River Falls Unique Area is a popular attraction for much of the year. The Salmon River Falls can be reached by a short hike on a hardened-surface, accessible trail from the accessible parking lot.

Programmatic Management Responsibilities

Management of the Lower Salmon River State Forest (LSRSF) will be accomplished with a DEC cooperative, interdivisional team approach to address intensive use of the area by anglers and other recreational users. The uniqueness and importance of the Salmon River fisheries dictate that the Regional Fisheries Unit (Division of Fish and Wildlife) and the Special Assistant to the Commissioner for the Salmon River will serve as the primary land managers. This represents added layers of management responsibilities since other State Forest lands are managed by the Division of Lands and Forests. Lands and Forests team members will provide advisory support and planning expertise for the Lower Salmon River State Forest with their extensive experience in both arenas.

Management activities for the duration of this plan will focus on providing fishing access, protecting the natural resources, and implementing the proposed river restoration and trail development/enhancement projects, with no emphasis on harvesting forest products. As such, the lands will not be subject to the Forest Stewardship Council® (FSC®) or Sustainable Forestry Initiative® (SFI®) certification programs that are required for State Forest lands managed by the Bureau of State Land Management within the Division of Lands and Forests. This management emphasis will be reevaluated in the future, especially if additional lands are added to the State Forest.

The Environmental Conservation Police Officers (ECOs) and Forest Rangers will be responsible for law enforcement activities on the LSRSF. ECOs and Rangers will work cooperatively and assist each other as needed.

Natural Resources Descriptions

The area surrounding the LSRSF is predominantly rural with a mix of forested and agricultural lands. A wealth of information was recently compiled on natural resources in the 173,000-acre Salmon River watershed, located in portions of Oswego, Lewis, Jefferson, and Oneida Counties. The collaborative reports include, among others, the Salmon River Watershed Natural Resources Assessment (2008) which highlights the area's significant natural resources and identifies conservation targets to guide management decisions, and the Salmon River Watershed Natural Resources Viability Analysis (2008) which indicates that many of the watershed's natural resources are currently in good condition and worthy of protection or restoration. The diverse partnership responsible for creating these vital reports includes:

- New York State Department of Environmental Conservation
- The Nature Conservancy
- New York Natural Heritage Program
- New York Sea Grant
- Tug Hill Tomorrow Land Trust
- Oswego County Environmental Management Council
- State University of New York at Oswego
- State University of New York College of Environmental Science and Forestry
- New York State Tug Hill Commission.

Summary of Historical Planning Initiatives and Community Decisions for the Salmon River Corridor

Several planning initiatives and studies have been developed by or in partnership with DEC over the past 25 years. The various plans, studies, and initiatives were undertaken to provide guidance to DEC and the Salmon River Corridor communities for development of natural resource management plans within the watershed. Community feedback primarily centered on enhancing fisheries and other recreational uses, while maintaining the rural character of the area and protecting the natural resources. See Appendix 2 for descriptions.

Area-Specific Regulations

General regulations applying to State Forest lands are found in Title 6, Chapter 2, Part 190 of the New York Code of Rules and Regulations (NYCRR). DEC developed area-specific regulations for the Lower Salmon River State Forest due to its unique character and the high-intensity recreational use of the area (Part 190.37):

1. **Camping is prohibited, including camping in vehicles.**

   The camping prohibition exists for many reasons. Litter and other density-related issues could negatively impact the character and health of the natural resources. It is also beneficial to local lodging establishments and private campgrounds to prohibit camping. Camping was not allowed on these lands while under National Grid ownership, so the prohibition does not represent a new restriction.

2. **No person shall discharge a rifle, shotgun, handgun or muzzle loader, except while hunting or trapping. Target practice is prohibited.**

   There are no additional restrictions on hunting or trapping on the area and the use of firearms is limited to those activities. The target practice prohibition supports fisheries-focused management of the State Forest by preventing potential use conflicts with anglers. Target practice is permitted on several State Forest lands in the area, in addition to a nearby private rod and gun club.

3. **The use of fire shall be limited to charcoal or gas grills from May through October. Standard regulations apply November through April** (see link above)**.**

   Seasonal restrictions on the use of fire protect public safety and the health of the natural resources from chronic issues related to warm-season group activities.

4. **The use of snowmobiles shall be confined to designated snowmobile trails.**

   Restricting snowmobile use to designated trails supports fisheries-focused management of the State Forest by preventing potential use conflicts with anglers and protecting sensitive foot trails from snowmobile traffic.

Fisheries Description

Lake Ontario was once home to a large, native population of landlocked Atlantic salmon that produced large runs to the Salmon River which was a major spawning location. This population was extirpated from the river and Lake Ontario prior to the turn of the century. The following fishery description focuses on the "modern era" which began with Pacific salmon stocking in the late 1960s.

Key Species

Alewife is an invasive species of prey fish that successfully invaded the Great Lakes, partially because the lakes are connected by canals for the shipping industry. With a relative lack of predators in the lakes, alewives were subject to extreme boom/bust cycles that resulted in immense windrows of dead fish littering shorelines following die-offs. Initial stockings of Pacific salmon in the Upper Great Lakes revealed that it was possible to reduce alewife numbers adequately to break the boom/bust cycle while providing new, exciting and economically important sport fisheries.

Following initial successes in the upper Great Lakes, Lake Ontario was stocked with Coho salmon (1968) and Chinook salmon (1969) sourced from the Upper Great Lakes. Returns from these early stockings were relatively poor due to excessive mortality caused by an over-abundant population of parasitic sea lamprey, another invasive species in the Great Lakes. Sea lamprey were first observed in Lake Ontario in the 1830s. The surviving salmon that did return from these initial stockings were relatively small and displayed a high degree of lamprey wounding.

The Great Lakes Fishery Commission has developed control programs for sea lamprey that are carried out by the Canadian Department of Fisheries and Oceans and the US Fish and Wildlife Service (USFWS) throughout the Great Lakes. Sea lamprey spawn in tributaries and their larvae live in tributaries or delta areas for at least three years prior to transforming into the parasitic phase that migrates to the lake and feeds on fish.

Control programs focus on killing the larval sea lamprey prior to their transformation. This is primarily accomplished by chemically treating the tributaries with the highly selective lampricide 3-trifluoromethyl-4-nitrophenol (TFM). The most recent TFM treatment in the Salmon River system occurred during the spring of 2018. To facilitate treatment, the

utility, Brookfield Renewable Partners (Brookfield), maintained a baseflow of 650 cubic feet per second (cfs) for the treatment duration as allowable under the Federal Energy Regulatory Commission (FERC) license.

One alternate technique used in the Salmon River watershed is a low-head adjustable barrier that was built by the Great Lakes Fishery Commission on Orwell Brook (Figure 2). The barrier is comprised of removable stop logs that are deployed seasonally to selectively block spawning migrations of sea lamprey while allowing the passage of trout, salmon and other aquatic organisms. The barrier structure also includes a sea lamprey trap. Use of the structure alleviates the need to chemically treat larval sea lamprey above its location.

Benefits of sea lamprey control efforts were realized in the Lake Ontario system by the early 1970s when numbers and sizes of salmon returning began to improve. Stockings of brown trout and steelhead rainbow trout were added in 1972 and 1974, respectively.

Figure 2. Sea lamprey barrier/trap on Orwell Brook. Stop logs are installed seasonally to exclude spawning sea lamprey migration and allow for fish passage. This alleviates the need to chemically treat for lamprey larvae above the structure.

Consumption Advisories

In 1976, New York State discovered that salmon in the system carried contaminant loads of polychlorinated biphenyls (PCBs), Mirex and dioxin at levels that were a human health concern. A 1976 ban limited stocking to maintaining a returning broodstock of Coho salmon to the Salmon River for contaminant monitoring purposes. The possession and

consumption of fish was severely curtailed. The ban was terminated in 1979 with restrictive health advisories placed on fish consumption limits.

As of 2018, there is still a one meal per month limit for brown trout over 20 inches and lake trout over 25 inches. Contaminant levels in the salmon and steelhead have declined enough that there are no longer additional recommended restrictions on consumption beyond the general consumption advisory of four one half-pound meals per month that applies to all waters of New York State. Additionally, the New York State Department of Health (DOH) recommends that women under the age of 50 and children under the age of 15 eat no fish from Lake Ontario. There are additional consumption advisories for various non-trout and salmon species. Health advisories are updated annually by DOH and available in DEC's annual Freshwater Fishing Guide.

Progression of Sport Fishing

DEC's Salmon River Fish Hatchery was constructed and opened in 1981 and production capability and numbers of fish stocked have since soared. Additionally, fish raised in the hatchery imprinted and returned to the hatchery, providing a dependable source of eggs for harvest and eliminating the need to import eggs from the Upper Great Lakes.

Early visions for the sport fishery focused on Lake Ontario and relatively little thought went into the development of the tributary fisheries. Substantial numbers of fish returning to the Salmon River and other tributaries contributed to a change in focus. Unfortunately, it was widely believed that Pacific salmon could not be caught with conventional sport fishing techniques since they cease feeding during their maturation process. Due to this belief, snagging techniques were legal and commonplace, which created an atmosphere that was not conducive to successful sport fishing techniques.

Early days of the snagging era were characterized by flagrant littering, excessive harvest of females for their eggs (to be sold), serious injuries to fishermen caused by flying treble hooks with heavy lead weights, aggressive behavior by anglers and an often-confrontational atmosphere. DEC led a long and contentious effort to transition the fishery to a sport fishery through legislative and regulatory changes, educational outreach and law enforcement efforts. Legal snagging was curtailed and eventually eliminated by 1995. While issues still exist, the fishery in its current state is vastly improved.

The evolution of fishing regulations on the Salmon River and other Great Lakes tributaries in NY has been driven by the transition of these fisheries from snagging to sport fishing for Pacific salmon and realization of the benefits of the catch and release of steelhead. These fisheries use specialized techniques and regulations are available in the DEC Freshwater Fishing Guide in the Great Lakes Tributaries section. The regulations are generally designed to enhance sport fishing opportunity and discourage the various forms of snagging.

Pacific salmon runs occur in the fall during September and October and typically account for about half of the annual angler effort. Pacific salmon die in the fall after spawning. The steelhead fishery usually intensifies in mid-to-late October as the salmon run subsides and continues through winter and into spring until the steelhead have spawned and returned to the lake (Figure 3). Ample numbers of fall Chinook and Coho salmon and

winter and summer run steelhead return to the Salmon River Fish Hatchery to meet egg demand. Both strains of steelhead spawn in the spring.

Hatchery-generated runs of Chinook salmon are also augmented by a naturalized population of wild fish that is the result of natural reproduction in the river (Bishop et al. 2017). These wild Chinook account for a substantive portion of the open lake (Lake Ontario) Chinook catch and half or more of the annual run returning to the river (Connerton et al. 2016). Far smaller numbers of wild steelhead and Coho salmon that are produced in the tributaries also likely contribute. Thus, the fisheries for steelhead and Coho are more dependent on stocked fish.

There is also a much less intense and unique summer fishery for Atlantic salmon and Skamania steelhead. Fisheries managers are concerned about maintaining Skamania steelhead as a component of the summer fishery. Recently enacted disease protocols that prevent DEC from holding adults in the hatchery have altered egg take dates and methods to the extent that returning adults are tending to run later, similar to winter run Chamber's Creek strain.

Figure 3. A happy angler with a Salmon River steelhead.

United States Geological Survey (USGS) crews from the Tunison Laboratory of Aquatic Sciences in Cortland, NY have recently documented natural reproduction of Atlantic salmon in the Salmon River for the first time in over 100 years. Numbers of wild young of year collected have been very small and survival to the smolt life stage, when they would typically migrate to the lake, has not been documented. Stocking histories, Salmon River creel survey reports and other fisheries related research on Lake Ontario are available from the Lake Ontario Committee annual reports to the Great Lakes Fishery Commission.

Economic Benefit

The Salmon River fisheries provide millions of dollars of annual economic benefit to the local area. The most recent New York Statewide Angler Survey for the calendar year 2007 estimated on-site angler expenditures at $18.8 million (Connelly and Brown 2009). That survey occurred in a year of extreme drought which resulted in greatly reduced flows in the river during the Pacific salmon run and almost certainly resulted in below average angler effort and the associated economic benefits in that year. DEC is currently conducting another Statewide Angler Survey for 2017, with results expected by early 2019.

Periodic creel surveys conducted by DEC reveal that angler effort often exceeds 100,000 angler trips per year (Prindle and Bishop 2017). Creel surveys provide estimates of angler effort and catch and harvest for the various species but do not address economic impact. These surveys reveal that approximately two-thirds of angler effort comes from non-New York State residents. Estimates of angler trips and catches of Chinook salmon and steelhead are provided below in Table 1.

It is important to note survey dates since different aspects of the fisheries were surveyed in different years. For example, the 1984 survey was part of the Great Lakes Angler Survey that covered the entire calendar year (NYSDEC 1984). The catch and effort estimates from September through November in Table 1 were partitioned to depict the portion of the annual effort and catches that occurred during the fall fishery. The 1989 and 1992 surveys were roving direct contact surveys designed by Cornell University (Connelly et al. 1989 and Bishop 1993). All subsequent creel surveys were access site surveys designed and conducted by DEC. The 1997-2004 surveys were designed to assess the fall steelhead fishery and did not capture the fall fishery for Pacific salmon.

The 2005-2006, 2006-2007, 2011-2012, and 2015-2016 surveys were all part of comprehensive surveys of Lake Ontario tributaries on the New York side of the lake, which covered all of the major tributary fisheries from the fall Pacific salmon fishery through the spring steelhead fisheries. The Salmon River accounts for approximately 60-75% (varies annually) of all angler effort expended on the tributaries on the New York side of Lake Ontario. DEC conducted a survey for 2017-2018 (results pending) and plans to continue to survey the Salmon River annually.

Table 1. Angler effort and catch and harvest estimates for Chinook salmon and steelhead from various creel surveys conducted on the Salmon River since 1984

Year(s)	Dates	Angler trips	Chinook salmon		Steelhead	
			Catch	Harvest	Catch	Harvest
1984	Jan 1 to Dec 31	140,911	143,244	83,784	36,925	20,699
1984	Sept-Nov	107,306	143,244	83,784	15,529	8,359
1989	Aug 17 to Dec 4	180,400	150,100	69,200	8,150	4,350
1992	Sept 3 to Nov 1	103,900	80,300	55,900		
1997	Oct 20 to Nov 30	7,061	----	----	1,543	554
1998	Oct 19 to Nov 29	7,009	----	----	2,830	523
1999	Oct 18 to Nov 28	11,372	----	----	4,751	1,010
2000	Oct 16 to Nov 26	11,231	----	----	2,870	806
2001	Oct 15 to Nov 25	12,563	----	----	3,660	746
2002	Oct 21 to Dec 1	9,381	----	----	2,743	555
2003	Oct 20 to Nov 30	6,183	----	----	1,960	357
2004	Sept 7 to Nov 28	90,825	85,251	24,360	6,924	1,314
2005	Sept 6 to Nov 30	75,985	89,448	25,998	7,738	1,441
2005-2006	Sept 6 to May 15	98,959	89,448	25,998	20,705	2,713
2006	Sept 9 to Nov 26	83,409	96,088	33,530	9,509	2,002
2006-2007	Sept 9 to May 16	87,539	96,088	33,530	21,489	3,869
2011	Sept 1 to Nov 30	112,109	85,106	31,516	39,697	3,657
2011-2012	Sept 1 to May 15	158,214	85,106	31,516	96,398	8,608
2015	Sept 1 to Nov 30	101,465	23,940	12,305	11,334	1,401
2015-2016	Sept 1 to May 15	129,018	23,940	12,305	25,170	3,405

White Water Releases

Summer white water canoeing, kayaking and rafting opportunities are also available on the Lower Salmon River due to prescribed whitewater releases mandated by the 1996 Federal Energy Regulatory Commission (FERC) license issued to the utility, currently Brookfield (Figure 4). Whitewater releases are subject to cancellation when upper reservoir levels are below a pre-determined threshold based on historical weather trends and reservoir elevation records.

The FERC license also established a Salmon River Flow Management Team (SRFMAT), a group consisting of representatives of various interests in the Salmon River. SRFMAT members include representatives from local municipalities, whitewater interests, fishing interests, utility personnel from Brookfield and representatives from DEC and USFWS. There is also an executive committee comprised of DEC and USFWS personnel and Brookfield representatives. The SRFMAT meets annually in May to review the previous

year and discuss any issues. The executive committee makes the final decision on whether to hold the whitewater release when reservoir elevation is near the threshold, which varies by date. The annual listing of release dates, daily flow levels and status of scheduled releases are available online (Table 2).

Table 2. Scheduling of the annual Salmon River whitewater releases from the 1996 FERC license

Release	Date	Size
5	Labor Day Weekend	750 cfs
4	First full Weeked in August	750 cfs
3	Two weeks prior to 4 (second July release)	750 cfs
2	Two weeks prior to 3 (first July release)	750 cfs
1	Two weeks prior to 2 (June release)	400 cfs

The following sections of this plan address the need for river restoration structures, with several structures proposed. The structures will improve navigation conditions for both whitewater-type boats (i.e., kayaks, canoes and rafts) and drift boats, by constricting the river channel and providing increased velocity and depth. The restoration techniques that will be implemented on the Salmon River were also used on the San Juan River in Pagosa Springs, Colorado, resulting in greatly improved conditions for kayaking.

Figure 4. Rafters enjoying a whitewater release on the Salmon River.

The Need for River Restoration and Fishing Access Trail Enhancement/Development

River systems are dynamic and sediment transport is a critical factor that influences channel morphology. An ideal river channel consists of series of pools, runs, and riffles with an appropriate meandering pattern that provides a variety of habitats for fish and other aquatic organisms. The channel neither aggrades nor degrades material due to bedload transport (used interchangeably with sediment transport). Most bedload transport occurs at 75 to 100 percent of bank full flows and these flow events typically occur at least once per year. Adequate floodplains are also critical in relieving pressure on the system when flows exceed bank full elevation by allowing excess water to escape the banks and dissipate energy.

The hydroelectric power generation projects on the upper Salmon River, specifically the Lighthouse Hill project on the lower reservoir that regulates flows into the Lower Salmon River, have a profound effect on channel definition in the lower river. The 1996 Federal Energy Regulatory Commission (FERC) license mandates continuous seasonal baseflows of 185 cubic feet per second (cfs) from May 1 through August 31, 335 cfs from September 1 through December 31, and 285 cfs from January 1 through April 30. Flows often exceed these levels when excess water is present in the system.

Prior to the FERC license agreement, the Lighthouse Hill project was operated in a "peaking" mode. Under the peaking mode of operation, the utility would alternately shut down releases to store water and generate power during periods of peak energy demand. This practice resulted in daily flows that alternated between 0 cfs (with some small leakage) and 2000 cfs (the hydraulic capacity of the turbines at Lighthouse Hill). The no-flow periods that were a detriment to fish and other aquatic organisms were eliminated with implementation of the baseflows.

Flows during the peaking era had greater capacity to transport bedload than the lower post-license flows. Implementation of baseflows has reduced the river's capacity to transport bedload and resulted in the filling-in of pools and widening of the river channel, causing deposition in areas that were formerly scoured. High flow events in this scenario result in further deposition, as the channel lacks adequate restrictiveness and depth to support the velocity necessary to properly transport bedload.

Blockage in the channel promotes bank scouring and opening of new erosion sources during high flow events, leading to channel migration. While the river would eventually "adjust" to the new flow regime, there would be an extended period during which the river provided sub-optimal habitat for fish and other aquatic organisms and the resulting adjustments could be detrimental to existing infrastructure along the river (e.g. bridges, homes, roads, villages).

The purpose of the recently completed and proposed stream restoration projects (discussed in the following section) is to provide bank stabilization, improve sediment transport, create improved habitat for fish and other aquatic organisms, improve conditions for navigation and, in some cases, protect human infrastructure. Bank stabilization projects reduce the amount of sediment entering the river, and are also

designed to narrow and deepen the channel by directing and concentrating flows, thereby increasing the water velocity at bank full elevation and providing the energy necessary to properly transport bedload. The techniques implemented in the current and proposed projects are intended to transform the currently plugged channels back into the natural pool, riffle, run sequences that provide more stable, natural and vastly improved habitat.

The intensity of the Lower Salmon River fishery is such that anglers accessing the river are also a substantial factor contributing to erosion. Erosion is exacerbated by the common use of steel cleats due to the slippery nature of the river bed substrate. Rerouting of some existing trails that cross environmentally sensitive areas, development of new trails and utilizing erosion resistant materials to construct or rehabilitate trails will be employed, where practical, to improve angler access and be more protective of the natural resources.

River Restoration Projects – Completed, Planned and Proposed

A truly comprehensive approach to river restoration goes beyond fixing individual problems. The entire river system should be holistically considered; circumstances upstream of a project affect the project and, likewise, the project affects channel dynamics downstream. For example, a project that stabilizes a cut bank will influence downstream dynamics by reducing bedload carried down the river and conditions upstream of a project influence the amount of bedload the project must transport. Thus, it is necessary to simultaneously address upstream and downstream issues on both public and private lands to achieve the best possible result.

State and federal funding sources have been, and will continue to be, used for projects on State Lands and lands on which the State owns public fishing rights. Projects on non-state owned lands will continue to be funded privately, by privately acquired grant monies, or in the case of the project in the village of Pulaski, a State budget line item. DEC allocated $500,000 to the Salmon River from the Lake Ontario Sportfishing Restoration Natural Resource Damages (NRD) settlement to be apportioned between river restoration and trail enhancement/development projects. A list of completed, planned and proposed restoration projects is provided below in Table 3.

Completed Projects

Initial restoration projects on the Salmon River included repairing a large section of cut bank in the Upper Fly-fishing Only Catch and Release Area above the Salmon River Fish Hatchery (Figure 5) and building a bed sill with vanes to block further formation of a secondary channel that would have further isolated the hatchery from the river (Figure 6). Once completed, the projects blend well with the natural scenery. Note the difference in vegetation on the projects below in Figures 5 and 6. The Upper Fly Area project photo in Figure 5 was taken several years after construction and the Figure 6 photo of the bed sill was taken the year it was constructed. Similar to the Upper Fly Area project, vegetation has now established on the bed sill and the structure looks much more natural. Both projects were funded by the NYS Clean Water/Clean Air Bond Act of 1996 that provided an allocation of $181,900. Two additional bankfull bench and vane projects were

subsequently constructed at the Church Pool in Altmar and at Ellis Cove with Great Lakes Restoration Initiative funding.

Table 3. Completed, planned and proposed river restoration projects for the Lower Salmon River

Project	Techniques	Funding Source	Status
Upper Fly Area	bankfull bench, vanes, floodplain	Bond Act	completed
North channel blocker at SRH	rock bedsill and vanes	Bond Act	completed
Church Pool	bankfull bench, vanes	GLRI	completed
Tailwater (Altmar)	bankfull bench, vanes	Private	planned
Ellis Cove	bankfull bench, vane	GLRI	completed
Phase 1 - Lighthouse Hill to Ellis Cove	toe wood shelves, blockers and rock vanes	LOSFR NRD	construction 2018-2019
Phase 2 - Ellis Cove to Pulaski	toe wood shelves, blockers and rock vanes	TBD	needs development
Village of Pulaski	rock shelves and vanes	NYS Budget	completed
Douglaston	toe wood shelves, blockers and rock vanes	Private	planned

Future Projects

Phase 1 - Currently Planned NRD Funded Restoration Projects (Lighthouse Hill Reservoir to Ellis Cove)

The proposed projects are intended to enhance fisheries habitat by improving sediment transport, narrowing over-wide reaches and stabilizing eroding banks. These objectives will be accomplished through the implementation of a natural channel design river restoration approach and would involve the installation of about 1,500 feet of toe-wood structures, two W-weirs, one J-hook, one cross-vane and six large wood channel blocks. A site location map with locations of the proposed structures and photos of similar structures are provided in Appendix 3. There will likely be some minor adjustments to current plans as the projects progress.

Some of the access roads to the structures will be developed into trails for angler access. Contracting for the Phase 1 projects will be through the DEC Division of Operations Job Order Contract (JOC) process, with construction beginning in 2018. There are also plans to construct restoration projects on private lands at the Tailwater Lodge property in Altmar and the Douglaston Salmon Run located below Pulaski. Projects completed on private lands will also be designed and constructed by USFWS partners but funded privately.

Phase 2 – Future Projects Pending Funding (Ellis Cove to Pulaski)

Design work to date focused on the Phase 1, NRD funded projects. Phase 2 projects and potential funding sources need to be developed. DEC anticipates that funding from Governor Andrew M. Cuomo's Adventure New York initiative may be available. USFWS and DEC staff floated the river from Ellis Cove to Pulaski to identify potential Phase 2 projects which will require further refinement and planning. Additional trail development, enhancement and relocation will also be addressed in Phase 2.

Figure 5. Restoration project in DEC's Upper Fly Fishing area consisting of a bankfull bench, vanes and a floodplain (opposite side of the river).

Figure 6. Bed sill structure across from the Salmon River Fish Hatchery. This structure blocked a secondary channel that was forming which would have diverted the main channel of the river around the mouth of Beaverdam Brook. The brook provides returning fish access to Salmon River Fish Hatchery.

Fishing Access

DEC currently provides a total of approximately 14 equivalent river miles (ERM) of permanent public fishing access to the main stem of the Lower Salmon River. An ERM would include both sides of the river so, for example, 1.25 miles on one side and 0.75 miles on the other side would comprise one ERM. The access includes 11.7 ERM on lands DEC owns outright and 2.3 ERM on which DEC owns public fishing rights (PRF). DEC's total ERM of fishing access will increase to 15.6 with the pending acquisition of an additional 1.6 ERM of PFR in the village of Pulaski; these areas are already being used for public fishing access. DEC's acquisition of PFR prevents future commercialization of the fishing rights and provides opportunity to implement state-funded river restoration projects in those areas. The portions of the river and tributaries publicly accessible to anglers and angler parking lots are shown below in Figure 7.

DEC owns PFR on lands that are not owned outright and not formally part of the Lower Salmon River State Forest that provide fishing access to the public and are of equal importance to anglers. Acquiring ownership of lands on which DEC already owned PFR provides greatly increased management flexibility. As the landowner, DEC can more feasibly build river restoration projects; enhance, build and/or relocate trails; and benefit from the protection provided by area-specific regulations. DEC also owns 0.9 ERM on the lower sections of Salmon River tributaries and additional sections of PFR in the Trout Brook and Orwell Brook systems.

Two special regulations fly fishing only catch and release areas are provided on the upper end of the Lower Salmon River. These areas are open seasonally. The Lower Fly Area is located between the County Route 52 bridge in Altmar, upstream to a cable located below the mouth of Beaverdam Brook. The Upper Fly Area is located just above the Salmon River Fish Hatchery and below the Lower Reservoir. The seasons and regulations for the fly fishing areas can be found in the DEC Freshwater Fishing Guide.

Oswego County owns the parking lot at County Route 2A (Compactor) which also offers a drift boat launch. DEC is currently pursuing ownership of the parking lot at the Black Hole in Pulaski, currently owned by the village. DEC owns the remainder of the parking lots identified on the map below in Figure 9, and plans to build new parking lots at County Route 2A across the street from the DEC Training Academy and at the Wire Hole in Altmar at the junction of County Route 52 and Tar Hill Road. There is potential for DEC to develop additional parking lots in the future.

In addition to the Oswego County-owned launch at County Route 2A, DEC offers drift boat launches at Altmar South and Pineville. The launch in Altmar is located just upstream of the County Route 52 bridge on the south side of the river. The Altmar launch is plagued by chronic gravel deposition and DEC periodically dredges the area to maintain adequate depth for safe launching. One proposed Phase 1 restoration project will reduce maintenance at the launch. Another option is to move the launch across the river and below the bridge. There is also a municipal drift boat launch at the ballpark in the village of Pulaski. Detailed maps of all fishing access infrastructure in the Lower Salmon River State Forest are provided in Appendix 4.

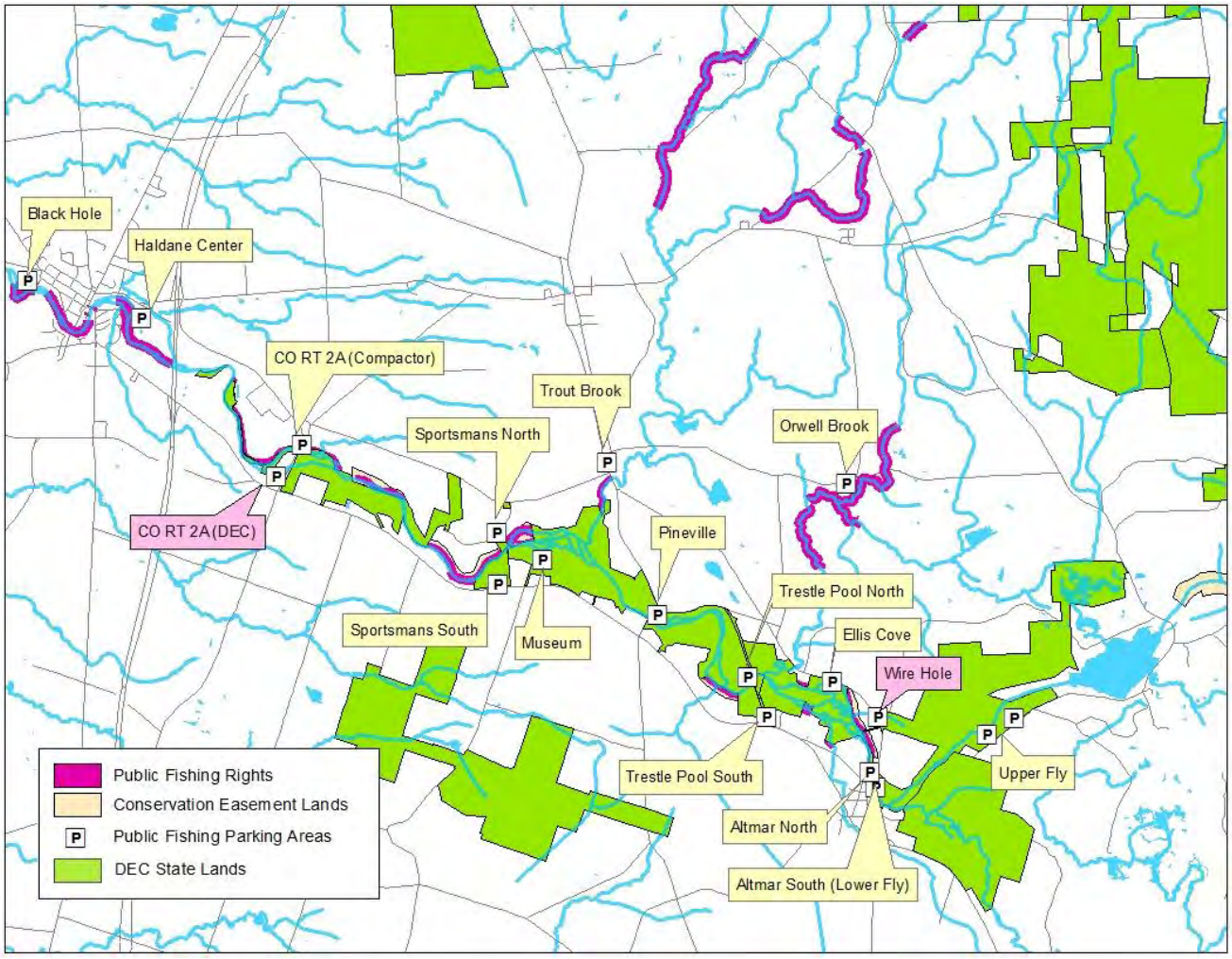

Figure 7. Publicly accessible fishing areas on the Lower Salmon River. These include DEC owned lands and lands where DEC owns public fishing rights. Existing parking lots are the cream-colored labels and parking lots to be constructed are the violet-colored labels.

Trails

Trails along the Salmon River play a vital role in providing access to the river. Over decades, miles of trails have been developed by anglers repeatedly accessing the river from parking areas and other access sites. DEC has not previously pursued trail development or improvements due to limitations in property ownership along the river. The recent acquisition of the Lower Salmon River State Forest will allow DEC to comprehensively plan and execute future trail enhancements and development.

The first step in developing a strategy for trail enhancement and development was to inventory existing trails. A 2017 DEC inventory documented 22.4 miles of trails. Trails were categorized by type (single track or wide track) and use intensity (heavy, light, and minimal), and the length for each was recorded. Single track trails are narrow trails with a tread width of 2 to 4 feet. Wide track trails are categorized as tread greater than 4 feet in width. Heavy use trails are those with a well-worn or eroded tread, light use trails have

a discernable trail but do not have the appearance of constant use, and minimal use trails display slight evidence of current or past use. A summary of inventoried trail mileages by width and use intensity is provided below in Table 4. Maps of existing trail locations are provided below in Figures 8 and 9.

Improved Access

To improve angler access and protect environmentally sensitive areas, DEC will reroute some existing trails and, where practical, use erosion resistant materials to construct or improve other trails. For example, DEC may relocate existing trails to higher ground to lessen environmental impacts on wetlands. DEC will also consider developing new trails where additional access is needed or improved networking would be advantageous. DEC expects to develop some new trails from roads constructed to build river restoration structures.

Table 4. Inventory of existing trails along the Lower Salmon River

Trail Type	Use Intensity	Trail Length (Miles)	Trail Length (Percent)
Single Track	Heavy	9.1	41
Single Track	Light	5.8	26
Single Track	Minimal	1.5	7
Total - Single Track	All Use Intensities	16.4	73
Wide Track	Heavy	4.3	19
Wide Track	Light	1.7	8
Total - Wide Track	All Use Intensities	6.0	27
Total - Both Widths	Heavy	13.4	60
Total - Both Widths	Light	7.5	33
Total - Both Widths	Minimal	1.5	7
Total - Both Widths	All Use Intensities	22.4	100

DEC anticipates that adjoining private landowners may request to create trails to tie into the public fishing rights and/or Lower Salmon River State Forest trail system to establish or maintain access to the river. Requests from both residential and commercial landowners will be considered on a case-by-case basis and be accommodated only where practical and consistent with DEC Division of Lands and Forests policies provided in the Strategic Plan for State Forest Management (Strategic Plan).

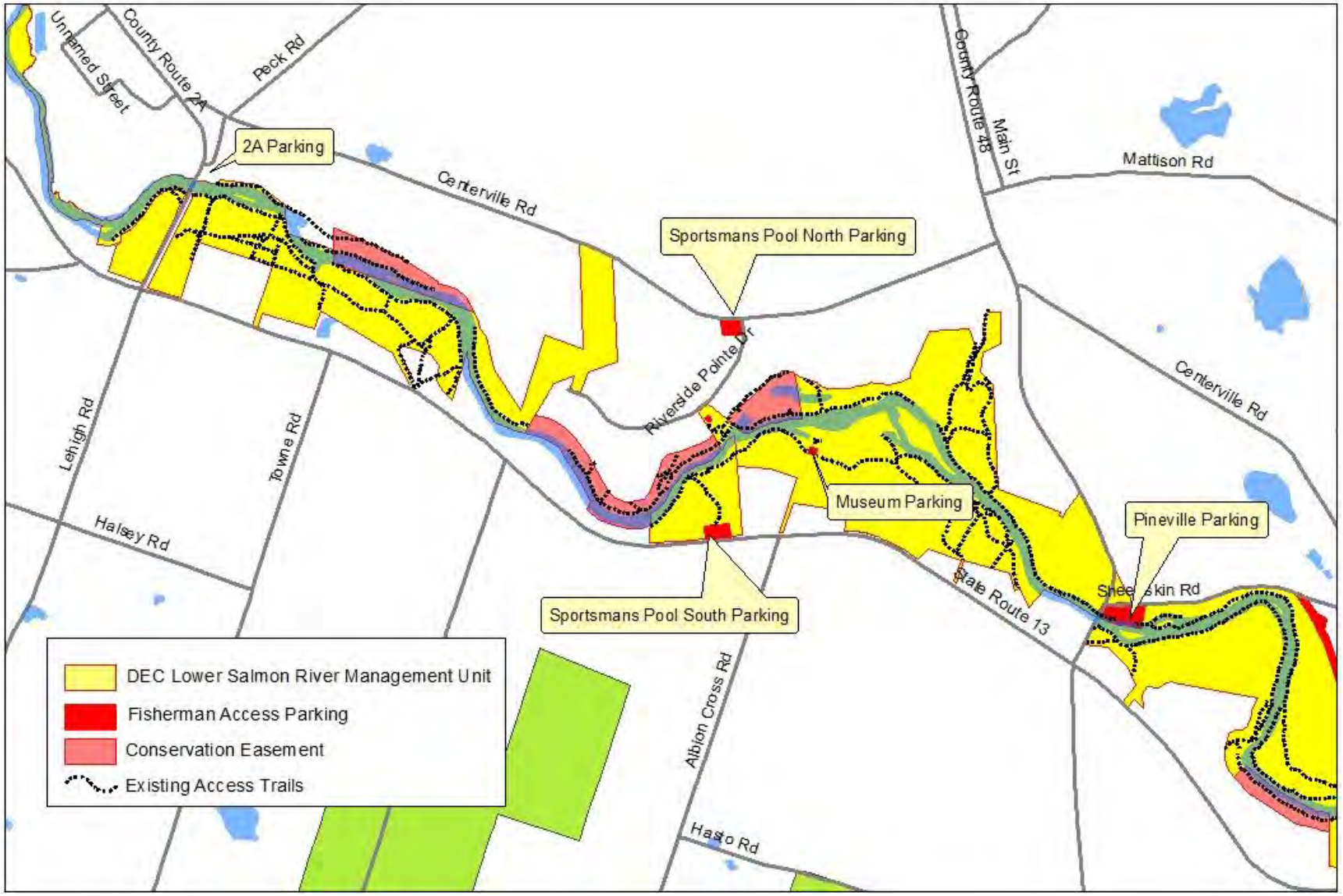

Figure 8. Existing trails along the Lower Salmon River from County Route 2A to Pineville.

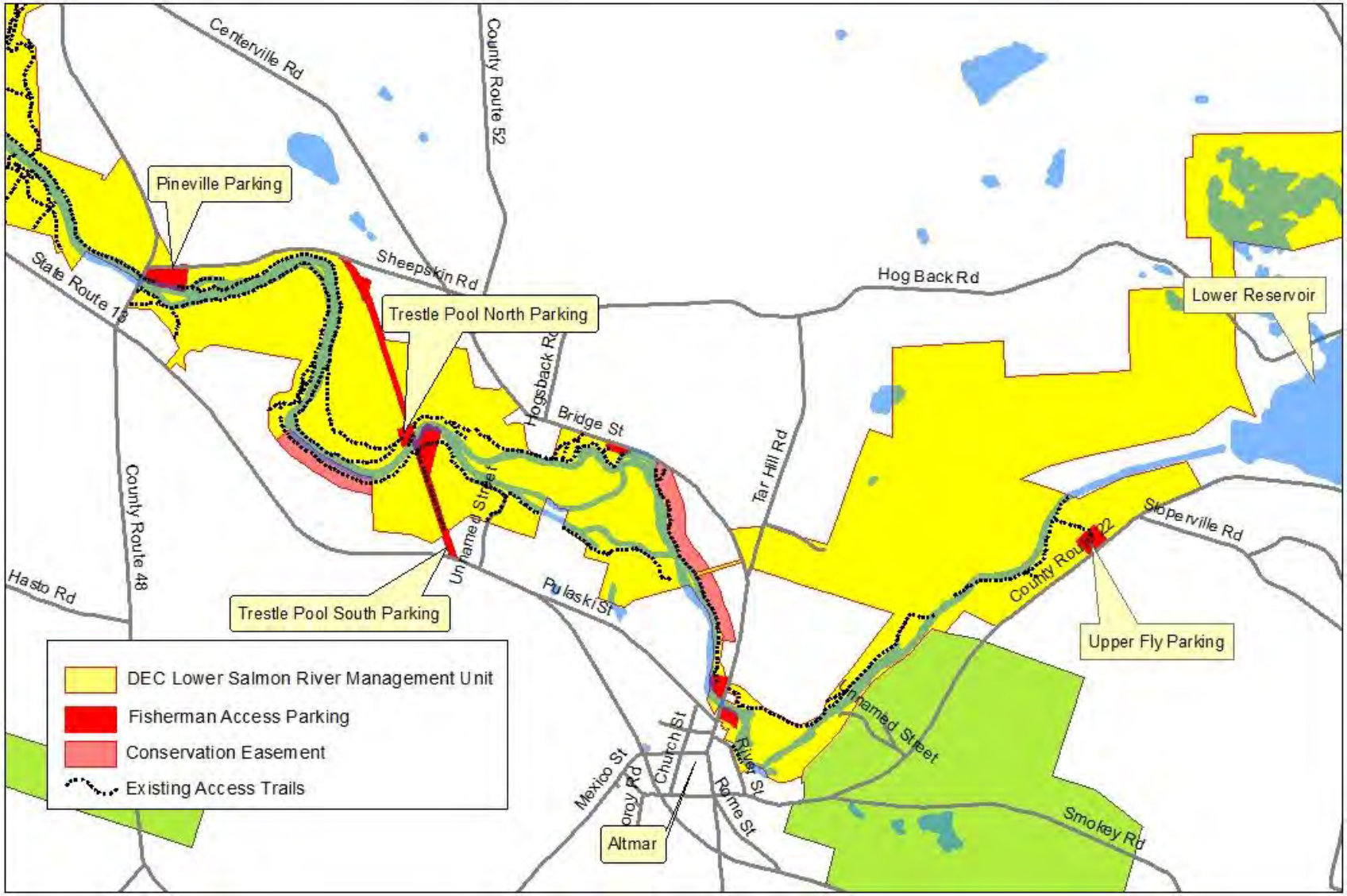

Figure 9. Existing trails along the Lower Salmon River from Pineville to the Upper Fly Fishing Area.

Accessible Recreation

Another consideration of DEC's trail enhancement and development strategy will be to leverage opportunities to provide accessible recreation, including improved access to the fisheries. The Strategic Plan also addresses the need to provide universal access with the following:

> *The Americans with Disabilities Act (ADA) mandates that it is the duty and responsibility of public agencies to ensure that people with disabilities have access to public recreational programs and facilities. While State Forests are generally rustic in nature, there are opportunities for universal access to hunting, fishing, wildlife viewing, nature immersion and other recreational programs.*

Over the past decade, DEC has upgraded or designed many State Forest parking areas, trails, access routes, platforms and other surfaces and facilities on State Forests in accordance with the Universal Access section of the Strategic Plan. In addition, some roads and trails are open, by permit only, to motor vehicle access by people with mobility impairments (see accessible recreation link above).

Developing a comprehensive trail plan incorporating the myriad considerations along the Lower Salmon River is beyond the scope of this document and will be the focus of future efforts as additional information on existing and desired trails is gathered. Future trail plans will address previously described issues and ensure that all trail enhancement and development activities comply with New York State regulations and DEC policies.

DEC's general guidelines for trail planning and construction include:

- Trail width should be kept to a minimum to meet the demand or need;
- Trails should be located in the best environmentally sustainable locations;
- Construction materials should be environmentally friendly and constructed with as natural a material as practical;
- Construction should be designed and materials used to minimize effects from high water events;
- Any or all necessary permits will be acquired and all special conditions met.

Trails associated with restoration structures will be built during construction of the Natural Resource Damages-funded Phase 1 river restoration projects. Additional funding (possibly through Governor Andrew M. Cuomo's Adventure New York initiative) will be sought to support future trail work.

Potential / Anticipated Costs

The US Forest Service developed a range of cost estimates for construction of new trails and maintenance of existing trails. The estimated range for new construction of foot paths is from $2,500 to $12,000 per mile. These estimates do not include the design or installation of bridges, hardened stairs or structures which lead down to the river. A general estimate for a hardened access to the river, a stream, or wet area crossing will likely cost an additional $50 to $100 per square foot. To develop a comprehensive cost

estimate, DEC must also consider the issues of project location and the ability to access the area with heavy equipment. Use of equipment can reduce the time required for construction but may also increase total project costs.

Permitting Considerations

State Environmental Quality Review Act

The nature and magnitude of the proposed river restoration and trail enhancement/ development projects require a Type 1 designation under the State Environmental Quality Review Act (SEQRA), as projects that could potentially have significant adverse environmental impacts.

The criteria DEC used to evaluate the environmental impacts of the river restoration and trail projects included, among others: change in ground or surface water quality or quantity; alteration in potential for erosion, flooding, or drainage problems; effects to the movement of any resident or migratory fish or wildlife species; impacts to threatened or endangered species and their habitat; impairment of historical, archeological, and community character; and change to the use of the recreational resources.

The Salmon River, from the confluence with Lake Ontario to the Lower Salmon River Reservoir, is a Coastal Water and Significant Coastal Fish and Wildlife Habitat, as defined in Article 42 of the NYS Executive Law. During DEC's SEQR review, a Coastal Assessment Form was completed, and the action was evaluated against the 44 Coastal Policies outlined in the June 2017 State Coastal Policies document from the New York State Department of State Coastal Management Program. DEC concluded that, per the State Coastal Policies document, the "project adheres to each policy statement as much as is legally and physically possible." A summary of the assessment is provided in Appendix 5.

Additionally, DEC's Division of Fish and Wildlife operates under a Programmatic Environmental Impact Statement (PEIS). This statement reviewed, and covers, the division's activities to protect and manipulate various elements of the physical environment to maintain or produce desirable habitats for fish and wildlife. The scope of the habitat management practices and objectives proposed for the Lower Salmon River State Forest have been previously reviewed under this broader PEIS. Completion of the SEQR process determined that plan activities would result in minor, short-term impacts, leading to a negative declaration and alleviating the need for a Supplemental EIS.

Water Quality

USFWS will construct the river restoration projects under US Army Corps of Engineers ACE Nationwide Permit 27, a general permit that covers stream restoration and other aquatic habitat modifications. DEC is exempt from obtaining a New York State Environmental Conservation Law Article 15 (protection of waters) permit but will abide by the environmental protection measures typically required in a permit. The anticipated

timeframe for in-stream construction activities is June 15 through August 31 to protect the fishery and support the local economy. This date range will accommodate the wild young of year Chinook salmon that will migrate to the lake by mid-June, as well as the major influx of anglers to the area on or after Labor Day weekend.

Threatened and Endangered Species

DEC performed a geographic information system (GIS) analysis to screen the various New York Natural Heritage Program databases for recent and historical occurrences of rare animals, plants and natural communities in the region. There were several occurrences of each within the Salmon River watershed, and none within the proposed project areas (Figure 10). DEC biologists surveyed the proposed Phase 1 project areas for freshwater mussels. The survey revealed low densities of Eastern Lampmussel, which is a common species. No other species were encountered.

Trees for toe wood structures will be harvested from nearby Happy Valley Wildlife Management Area (WMA). DEC Bureau of Wildlife has a goal of establishing 10 percent of the acreage on WMAs as "early successional" habitat through the Young Forest Initiative, which includes harvesting large trees. Wildlife staff met onsite with USFWS and DEC Lands and Forests and Fisheries staff to discuss river restoration project needs and evaluate potential sources of trees. Wildlife staff incorporated identified project needs in the Happy Valley Habitat Management Plan.

To avoid disturbing roosting or nesting Indiana or Northern long-eared bats, DEC will stockpile trees for toe wood structures in late fall and/or winter when bats are not present. DEC estimates tree harvesting for the Phase 1 toe wood structures during the fall of 2018.

Wetlands

Some of the river restoration projects and trails built to access them will cross wetlands, as do some existing trails. Maps of the potentially affected wetlands are provided in Figure 11. DEC Region 7 Division of Environmental Permits issued a General Permit for all of the proposed work within the plan that requires a Water Quality Certification and/or a NYS Freshwater Wetlands permit.

Historical/Cultural Resources

A State Historical Preservation Office (SHPO) review was conducted for the project area along the Lower Salmon River and the areas on the Happy Valley Wildlife Management Area where trees for toe wood restoration structures will be harvested. Since trees will be harvested with their root-systems intact, there will be soil disturbance. Through completion of the SEQRA Environmental Assessment long form, DEC identified archeological resources in the project area along the Lower Salmon River where trail work is planned. DEC worked closely with SHPO and received clearance to proceed with all proposed project activities provided trail work is completed at or above existing grade.

Public Outreach

DEC Region 7 Natural Resources and Public Participation staff held two public meetings to present the Draft Unit Management Plan for the Eastern Lake Ontario Forest Management Unit and planning information on the Lower Salmon River State Forest. The meetings were held at Pulaski High School on the afternoon of August 1 and evening of August 3, 2017.

Natural Resources staff presented information about the Lower Salmon River including acquisition of the National Grid lands, background on the fisheries and information on what DEC had planned and accomplished to date with an emphasis on river restoration. DEC sought input from the public to help further guide planning efforts. Public comments from the meetings were generally aligned with DEC's proposed management actions.

Comments received during public meetings emphasized the importance of vegetated riparian buffer zones to protect water quality through erosion control and create shade along streambanks to control water temperature. Streambank shade was identified as particularly important on tributaries to enhance natural reproduction of trout and salmon species requiring summer nursery habitat. Comments also emphasized the importance of maintaining large trees and other vegetation to retain water and mitigate flood effects. DEC recognizes the protection of wetlands as critical to retention of stormwater, water quality protection, and fish and wildlife habitat.

DEC contacted the Oneida Indian Nation for comment. The Nation expressed concern about whether proposed river restoration structures would negatively impact kayaking. Generally, the proposed structures will improve conditions for navigation of all types of boats including kayaks, as described in the White Water Releases section.

On April 11, 2018, the completed draft plan was posted in the Environmental Notice Bulletin, including announcement of the 30-day comment period ending May 10, 2018. DEC Staff presented the approved draft plan to the Oswego County Tourism Advisory Council on April 17, and hosted a public open house on April 26 at the Salmon River Fish Hatchery to answer questions and describe the plan. The plan was well-regarded and no additional substantive comments requiring response were received.

Conclusion

DEC developed this management plan with the goal of protecting and enhancing the unique and important Salmon River fisheries. Management activities for the duration of this plan will focus on providing fishing access, protecting the natural resources, and implementing the proposed river restoration and trail development/enhancement projects.

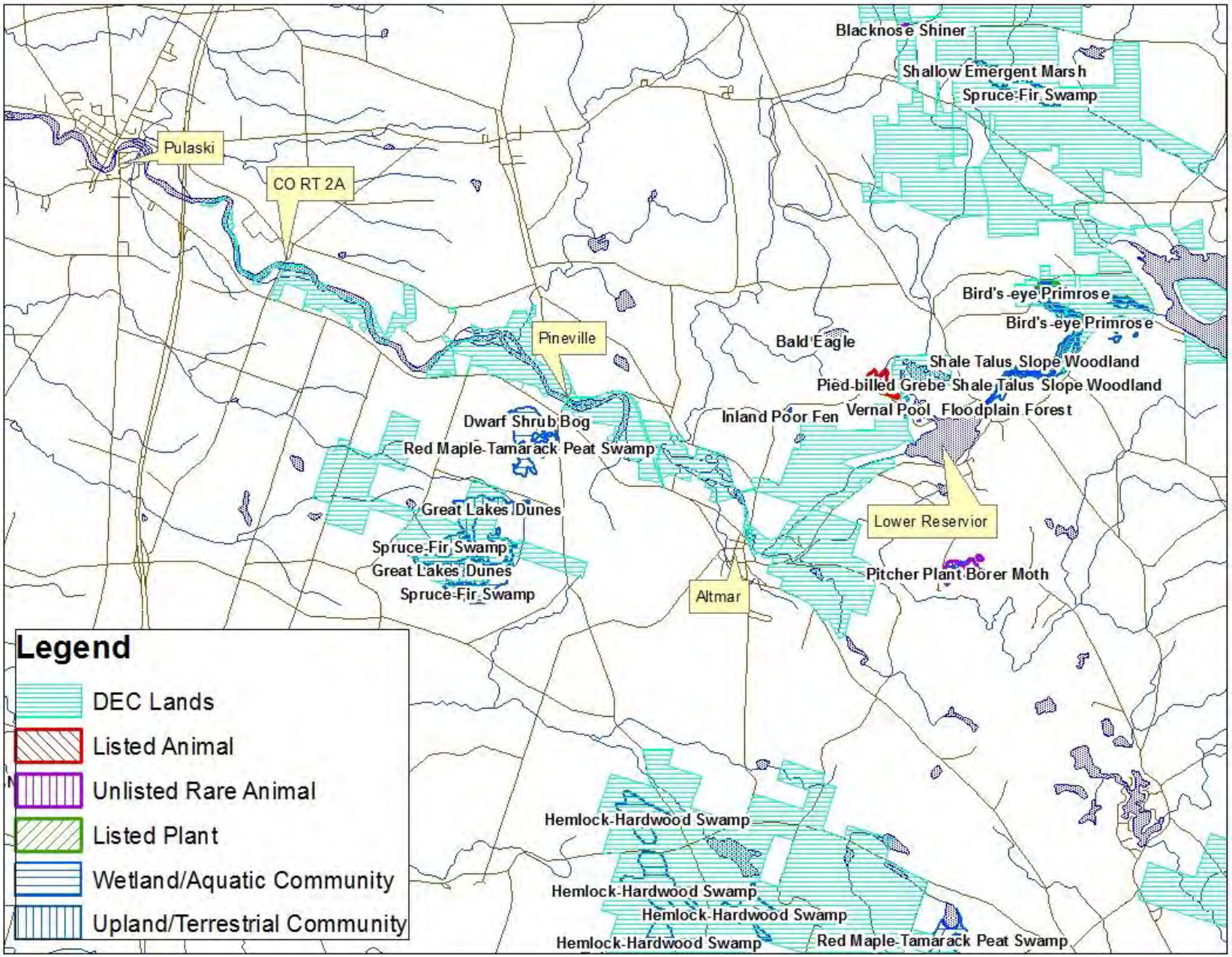

Figure 10. Rare plants, animals and natural communities located near the Lower Salmon River State Forest.

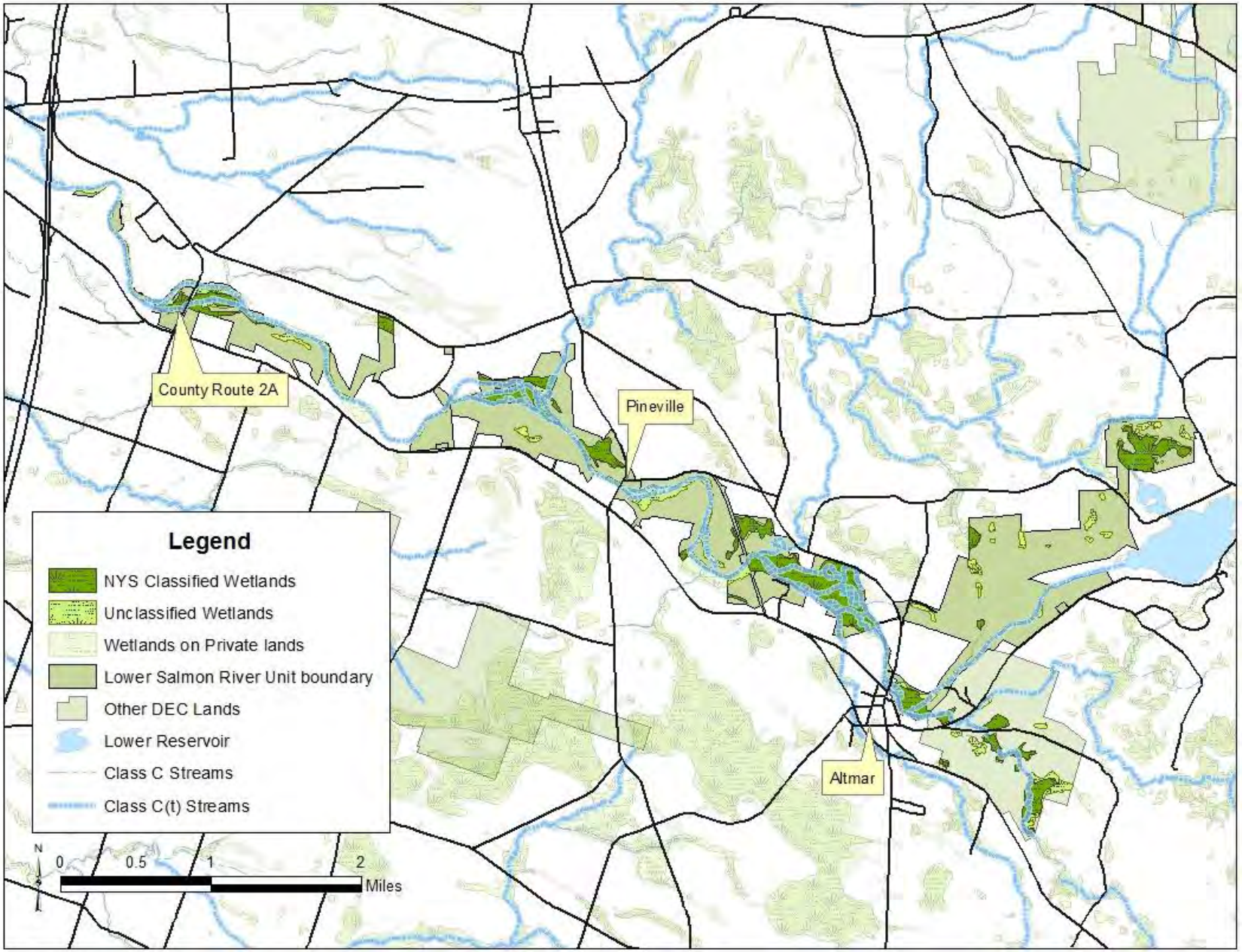

Figure 11. Wetlands in Lower Salmon River State Forest and stream classifications.

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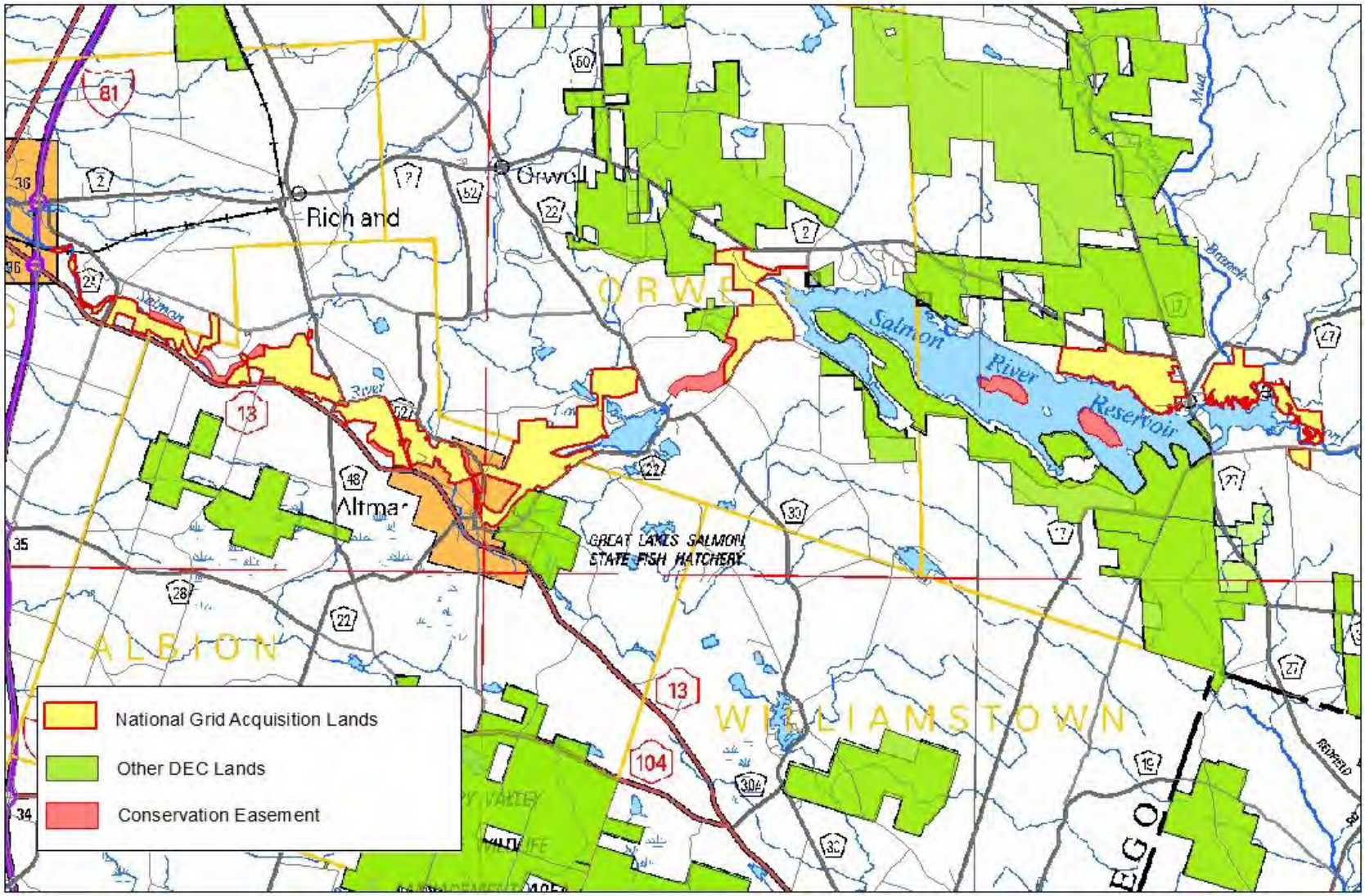
Appendix 1: DEC Lands Acquired in the Salmon River Watershed

resulting from the December 2016 National Grid Settlement (2,825 acres)



Appendix 2: Summary of Historical Planning Initiatives and Community Decisions for the Salmon River Corridor

Several planning initiatives and studies have been developed by or in partnership with DEC over the past 25 years. The various plans, studies, and initiatives were undertaken to provide guidance to DEC and the Salmon River Corridor communities for development of natural resource management plans within the watershed, and are summarized below. Community feedback primarily centered on enhancing fisheries and other recreational uses, while maintaining the rural character of the area and protecting the natural resources.

Tug Hill Reserve Act

New York State Senate and Assembly, 1992

Section 1 of the Act states "The legislature finds that the Tug Hill Region as defined by law, provides water, wildlife, forest, farm, and recreational resources of nationwide, statewide and regional significance." Definition 11 of the Act states "major river or stream corridors" shall mean a Tug Hill region river identified for its significant water supply, recreational, habitat or scenic value.

Although the Lower Salmon River and its surrounding State Lands, now the Lower Salmon River State Forest, are technically outside the Tug Hill Reserve, the attributes described above certainly meet the criteria for similarly managing and protecting the natural and recreational resources of the area.

A Comprehensive Land Management Program for the Salmon River Properties

Niagara Mohawk Power Corporation, 1992

The primary purpose of the Comprehensive Program was to manage Niagara Mohawk's Salmon River properties. These properties are now the major land resources of the Lower Salmon River Sate Forest acquired from Niagara Mohawk (now National Grid) through a consent order with the State of New York.

Since the 1980 opening of the Salmon River Fish Hatchery in Altmar NY, the character of the Oswego County Salmon River region has changed dramatically. The scenic Salmon River has been transformed from a relatively passive recreational river into one of the most productive and heavily utilized sport fisheries in America. Increased tourism has boosted economic development in the area, but can also burden local infrastructure and transform the rural quality of life. The proper course of recreational development, economic growth, and scenic habitat are all issues of immediate concern.

Needs and primary concerns identified in the Program include:

- Lack of recreational diversity – sport fishing is the area's most notable recreational attraction;
- Homogeneous user type – sport fishing is predominantly a male activity;

- Limited recreational /economic season – the large majority of tourists visit the Salmon River during the September and October salmon run;
- The perception that the Salmon River is a day use destination. Many visitors do not spend significant time or money in the Salmon River communities as compared to other recreation/tourist centers;
- Lack of appropriate fishing related infrastructure. Improved river access, restrooms, support facilities, and informational/educational services are needed;
- Lack of quality services. Private development has focused on the short duration needs of the homogeneous river user. Commercial development has been primarily limited to low budget motels and fast food restaurants;
- Poor social, environmental, and angling ethics. Littering, rowdiness, unsportsmanlike practices, and a general lack of courtesy and respect for the resource devalues the outdoor experience; and
- Environmental degradation. River bank erosion, habit deterioration, and the decline of aesthetic character resulting from overuse of the resource are significant concerns.

Goals identified to address needs and primary concerns include:

- Enhance the Salmon River as America's premier sport fishing destination;
- Have the Salmon River Corridor and its many resources provide a diversified year-round recreational opportunity that promotes a healthy, broad-based economy for the local area while enhancing the environment, outdoor ethics, and quality of life for the community.

Strategies identified to achieve the aforementioned goals include:

- Build a year-round destination –orientated tourism center;
- Further develop recreational services and facilities;
- Appeal to a wide range of income groups; and
- Conserve the scenic and environmental character of the river corridor. Visual buffers should screen all proposed development from the scenic waterway.

Salmon River Corridor Citizen Survey Results

Salmon River Greenway Committee, 1996

Following the release of the Niagara Mohawk Comprehensive Plan for the Salmon River Properties, communities along the river corridor designed a survey to assess landowners' desires and priorities for the future of the corridor. The collaborative Tug Hill Council secured a grant to carry out the survey in cooperation with the other members of the Salmon River Greenway Committee. The Tug Hill Council includes members from the 14 towns that comprise the core of the Tug Hill region, the source of the waters that flow into

the Salmon River. The Salmon River Greenway Committee includes representatives from local, county, and state governments and the Tug Hill Council.

In the spring of 1995, the survey was mailed to 4,800 landowners in the river corridor through a joint effort of the S.R. Greenway Committee, whose members provided manpower and financing for the survey. The project was funded in part by the Rural New York Environmental Action Fund administered by the Open Space Institute with support of the J.M. Kaplan Fund, through a grant to the Cooperative Tug Hill Council. 1,700 surveys were completed and returned. Survey results showed strong support for maintaining the character and environmental quality of the river corridor. Some of the attributes in the survey that residents rated highly were the following:

- Reasons to live or own property were the natural resources of the area and rural atmosphere.
- Type of development to be encouraged included single family homes, skiing, hiking, biking trails, and fishing access trails.
- Types of development to be discouraged included mobile home parks, apartments, multi-family dwellings, and mobile homes on lots.
- Actions to manage future growth included encouraging developers to locate structures in ways that preserve open space, control the location and type of development through zoning and control the location and types of mobile homes.
- Recreation and tourism related facilities important to develop along the Salmon River and (upper) Salmon River Reservoir included hiking, skiing, a fishing access trail from Pulaski to Redfield, the Salmon River Falls overlook recreation area, and improved educational and tourist services at the NYSDEC Salmon River Fish Hatchery.
- Corridor characteristics they felt were important included clean streams, pure groundwater and wells, and wildlife habitat.

Salmon River Fisheries Enhancement Plan for the Salmon River, NY, A Tributary to Lake Ontario

United States Fish and Wildlife Service, 1994

The executive summary states the plan will lay the groundwork for future enhancement and preservation of the fisheries resources for the Salmon River. Challenges for the future include assessing current information gaps and setting ecosystem requirements to improve and protect the fishery.

Toward achieving Lake Ontario fishery management objectives of the Salmon River Fisheries, the Enhancement Plan shall:

- Present historic and current fisheries resources information including hydrology, modifications, species composition and water quality.
- Note significant changes in fishery conditions such as species abundance, distribution, and productivity. Identify probable causes for changes noted with

emphasis on the degradation of sensitive fish habitats such as spawning and nursery grounds.
- Ascribe current fishery resource values in terms of expenditures to date.
- Define fishery management objectives for the Salmon River.
- Recommend fisheries restoration activities where needed.

Plan Management Goals and Objectives Downstream of Lighthouse Hill Reservoir:

Goal 1 – Provide a diverse, high quality aquatic habitat, and improve the present water quality to restore a healthy, diverse community of indigenous aquatic organisms and to support the management of indigenous and introduced fish species.

Objectives
- By the year 2000:
    - Achieve minimum baseflows that attain suitable habitat for year-round survival of indigenous and introduced fish species and enhances the year-round fishery
    - Achieve a program of gradual flow changes from minimum to generation and back.
    - Stabilize one half mile of critical river bank erosion areas.
    - Determine the need and feasibility of creating additional holding areas for adult salmonids
- Maintain water quality through compliance of the SPDES permit process
- Improve summer water temperature regimes by providing baseflow released from Lighthouse Hill Reservoir
- Protect critical habitats through Articles 15 and 24 of the NYS Environmental Conservation Law and applicable federal laws

Goal 2 – Develop a premier year-round sport fishery for trophy sized lake run salmonids consistent with management objectives for Lake Ontario.

Objectives
- By the year 2000, develop a salmonid run that consists of 80,000 fish of the following species: Chinook salmon, Coho salmon, winter and summer run Steelhead, Atlantic salmon, and Brown trout.
- By 2003 develop a summer component of the run that includes Atlantic salmon and steelhead.
- Maintain a September through May salmonid fishery that receives 150,000 angler trips
- By 2005
    - Develop a June through August fishery that receives 3,000 angler trips
    - Develop through public participation, regulations to promote reduced harvest of low abundance species or strains
- Monitor salmon runs with creel surveys and hatchery collections every 5 years.

Goal 3 – Provide brood stock runs of migratory salmonids to the Salmon River Fish Hatchery adequate for statewide /Great Lake's needs.

Objectives

- Annually monitor returns to the hatchery to estimate future brood stock requirements
- Continue release techniques research to maximize correct imprinting and survival
- Identify all brood stock releases by fin removal
- Select summer run steelhead and Atlantic salmon brood stock to develop/ maintain June through August runs

Goal 4 – Maximize the warm water fishery in the river and estuary consistent with goal 2.

Objectives

- Protect lake dwelling species while spawning and protect spawning and nursery habitat year-round
- Produce a warm water fishery with annual fishing effort of 5,000 trips
- Determine the potential impact of a resident or seasonal walleye population on obtaining objectives in goals 2 and 3

Goal 5 – Capitalize on the potential, if any, of natural reproduction by Atlantic salmon in the river and its tributaries without adversely impacting existing fisheries.

Objectives:

- Document successful reproduction, if any, by Atlantic salmon in the system by the year 2005
- Develop stocking strategies to produce adult runs to areas when spawning success by Atlantic salmon has been demonstrated

Goal 6 – Utilize the Salmon River for lake sturgeon spawning and nursery area if suitable.

Objectives

- Determine suitability by 1997
- Establish a juvenile population in suitable habitat by the year 2000
- Monitor for the presence of adults and or fry biannually

Goal 7 – Maximize the potential use of the lower river and estuary for forage species spawning and nursery.

Objectives:

- Identify habitat suitable for spawning /nursery area by 1996
- Protect identified habitat through application of Articles 15 (Protection of waters) and 24 (Freshwater wetlands) of the Environmental Conservation Law

Goal 8 – Maximize opportunities for a diversity of quality angling experiences.

Objectives

- Participate in an access infrastructure development and maintenance plan to be completed by 1996
- Develop a plan for non-traditional funding sources for access facilities maintenance by 1996
- Establish an additional fly fishing area and parking area upstream of the Salmon River Fish Hatchery by 1995

DEC's discussions on the current state of the fisheries with stakeholders indicates progress on many of the goals listed above. Bureau of Fisheries staff met with the Tug Hill Chapter of Trout Unlimited (April 1998) and the Oswego County River Guides Association (May 1998) to develop elements of a fisheries management plan for the Salmon River.

Discussions centered on the summer fishery, which is the least developed portion of the fishery. The roles of lake run Atlantic salmon, Skamania steelhead, stocked resident brown trout, regulations and various management approaches were discussed. Progress on a formal plan was delayed until post-acquisition when staff assembled a focus group comprised of tributary anglers and members of the local business community to develop a comprehensive fisheries management plan for the river.

Salmon River Greenway Corridor Bio-Inventory and Final Sustainable Economic/ Community Enhancement Development Plan

Dru Associates Inc., Sept, 2003

Oswego County received $55,000 through the Governor's Quality Community Grant program to implement a plan that would address sustainable development in the corridor. The county was concerned about the Salmon River Corridor area as an environmental resource, natural community asset, and a positive contributor as a tourism and recreational destination.

Salmon River Hydroelectric License Settlement

United States of America Federal Energy Regulatory Commission, 1996

The Low Impact Hydropower Institute provides an overview of the hydroelectric project in addition to a PDF of the license. Highlights of the license follow.

- Provide continuous baseflows downstream of the hydro project to protect the downstream fishery. Seasonal baseflows of 185 cubic feet per second (cfs) May 1 through August 31, 335 cfs September 1 through December 31, and 285 cfs January 1 through April 30
- Provide 5 releases for paddling recreationists and trigger summer migration of Atlantic salmon and summer steelhead. One in June (400cfs), two in July (750cfs), one in August (750cfs), and one Labor Day weekend to also start the fall Pacific salmon run (750cfs)

- Enhance aesthetic conditions
- Use gradual flow increases and decreases (ramping) during scheduled discharge changes
- Provide flows needed by the NYSDEC Salmon River Fish Hatchery, up to 22cfs (in addition to mandated baseflows)
- Geographic scope of the license encompasses the mainstem of the Salmon River for the trout and salmon fisheries
- The trout and salmon fisheries have both local and regional significance because trout and salmon which utilize the Salmon River supplement the fish populations throughout Lake Ontario
- Recognize that fishery enhancements in the Salmon River will provide benefits to the trout and salmon fisheries throughout their entire range
- Operation of the project directly impacts the Salmon River Fish Hatchery and NYSDEC's ongoing trout and salmon stocking program in the Salmon River
- Recent trends indicate angler use of the Salmon River reflect increasing local, regional, and national importance of recreational fishing resources
- The primary objectives of license are to provide beneficial, dependable, and inexpensive electrical energy, and improve the fisheries to benefit anglers
- License provides
    - Permanent easements to all NYSDEC fishing access locations downstream of the Lighthouse Hill development
    - Fishing easements along most of Niagara Mohawk's property downstream of the Lighthouse Hill development
    - 200-foot-wide conservation easements along the downstream corridor
    - Other easements such that a trail system can be developed along the entire corridor

Salmon River Greenway Signage Plan Report and Recommendations

New York State Tug Hill Commission and Salmon River Greenway Committee, 2000

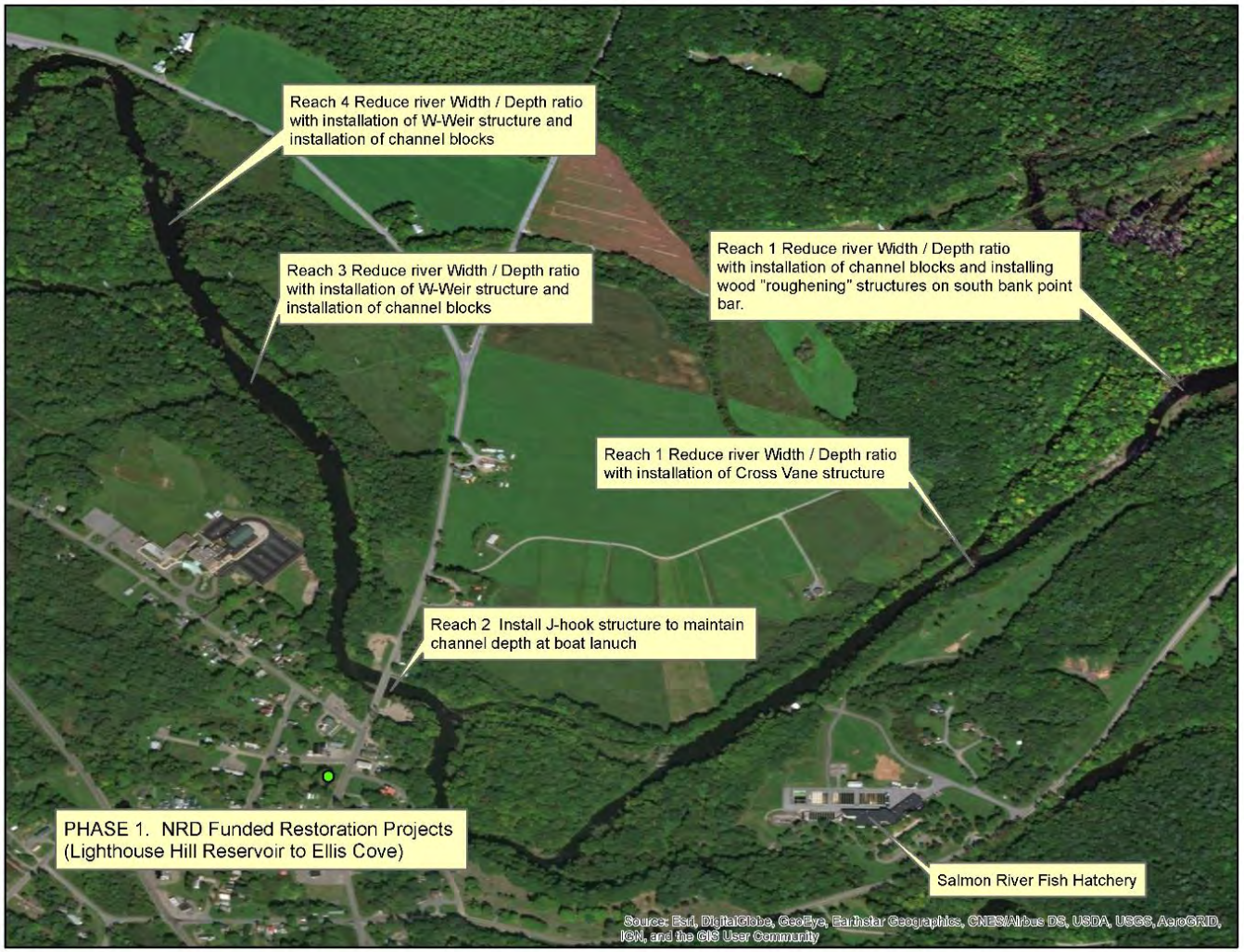
Several objectives were used to guide the development of the recommendations for a signage plan. A signage plan for the Salmon River Corridor would serve to:

- Increase visitor awareness of local resources
- Orient visitors to important sites/landmarks/attractions in the community
- Promote the use of local facilities by visitors and promote the local economy
- The study area for this report was defined as a one mile wide area along the length of the Salmon River from the reservoir in Redfield to the river's outlet into Lake Ontario at Port Ontario

Sites were noted from several different perspectives such as natural resources, fishing resources, cultural and historical resources, and recreation resources.

Appendix 3: Proposed River Restoration Structures – Phase 1

Lake Ontario Sportfishing Natural Resource Damages Assessment-funded river restoration projects



Photographs of examples of the different structure types are provided in the following pages.

W-Weir structure

Toe wood structure

Cross Vane structure

J-Hook structure

J-Hook for bank stabilization and habitat enhancement

Raw bank before restoration

Three years post restoration

Cross Vane used to redirect flow vectors

Before restoration

Three years post restoration

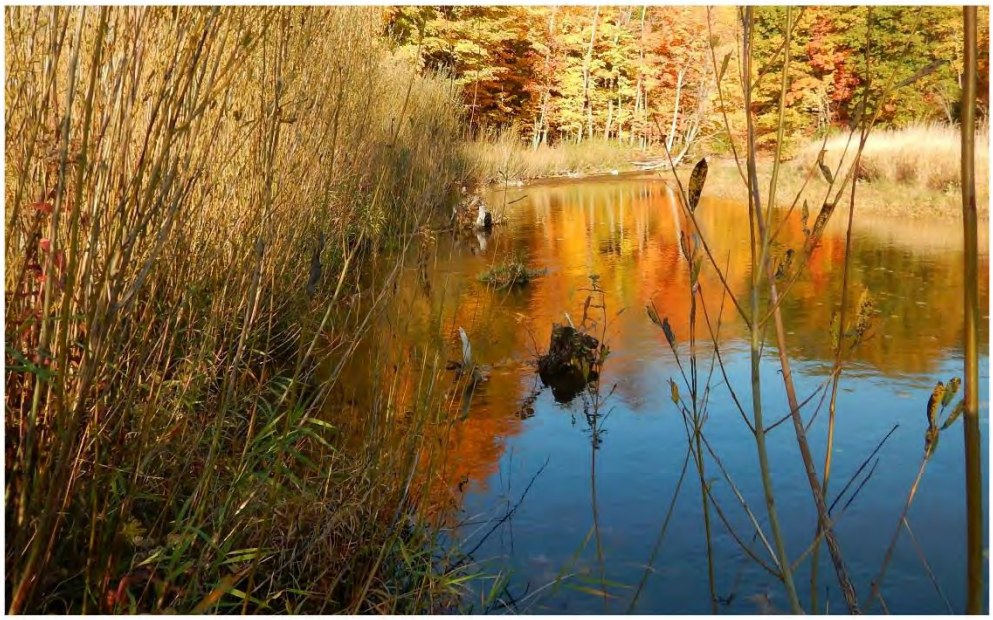
W-Weir used to reduce channel width

After construction note wide channel upstream of structure

One year after construction note deposition upstream

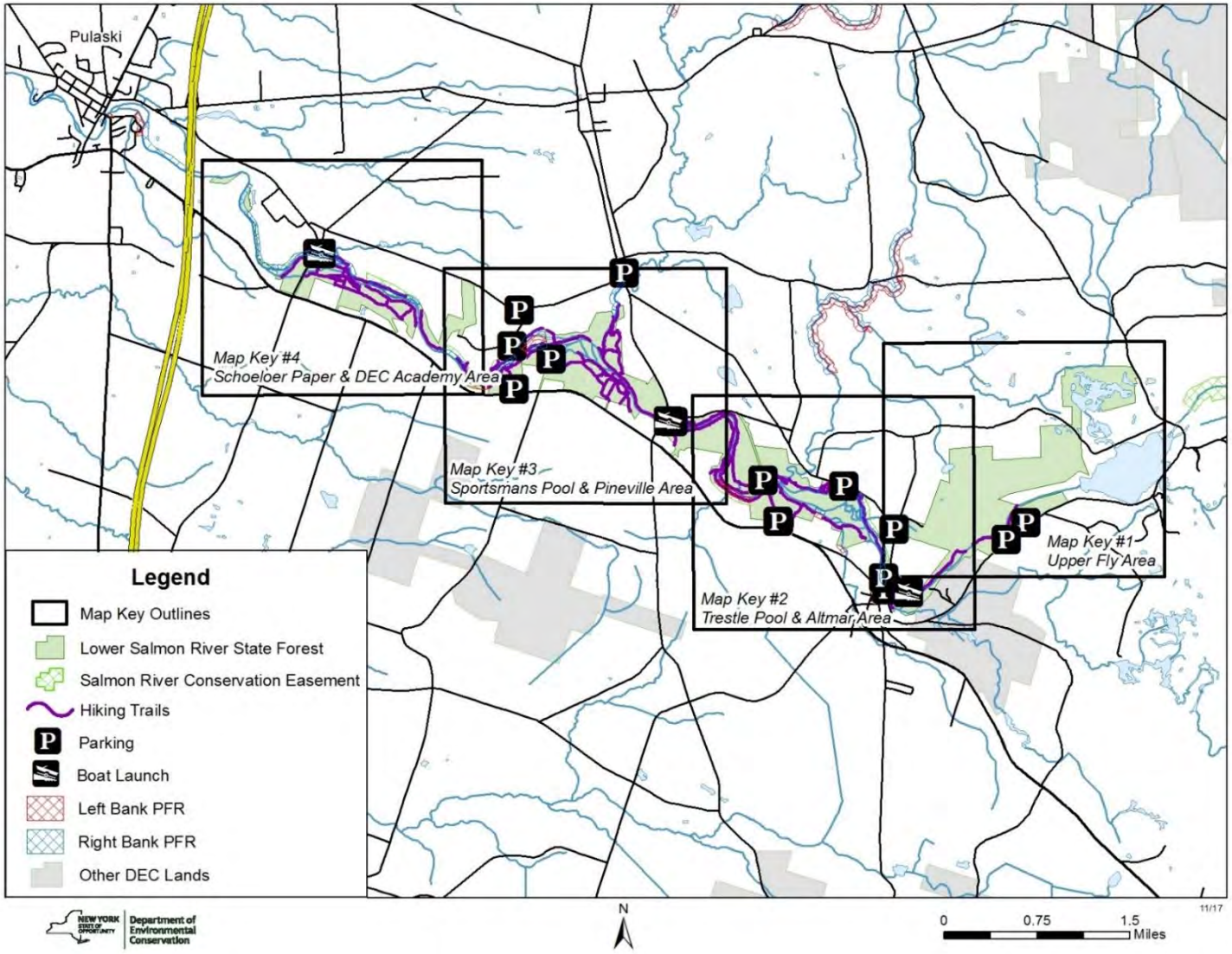
Toewood stabilizes banks and improves instream habitat

Eroding bank prior to restoration

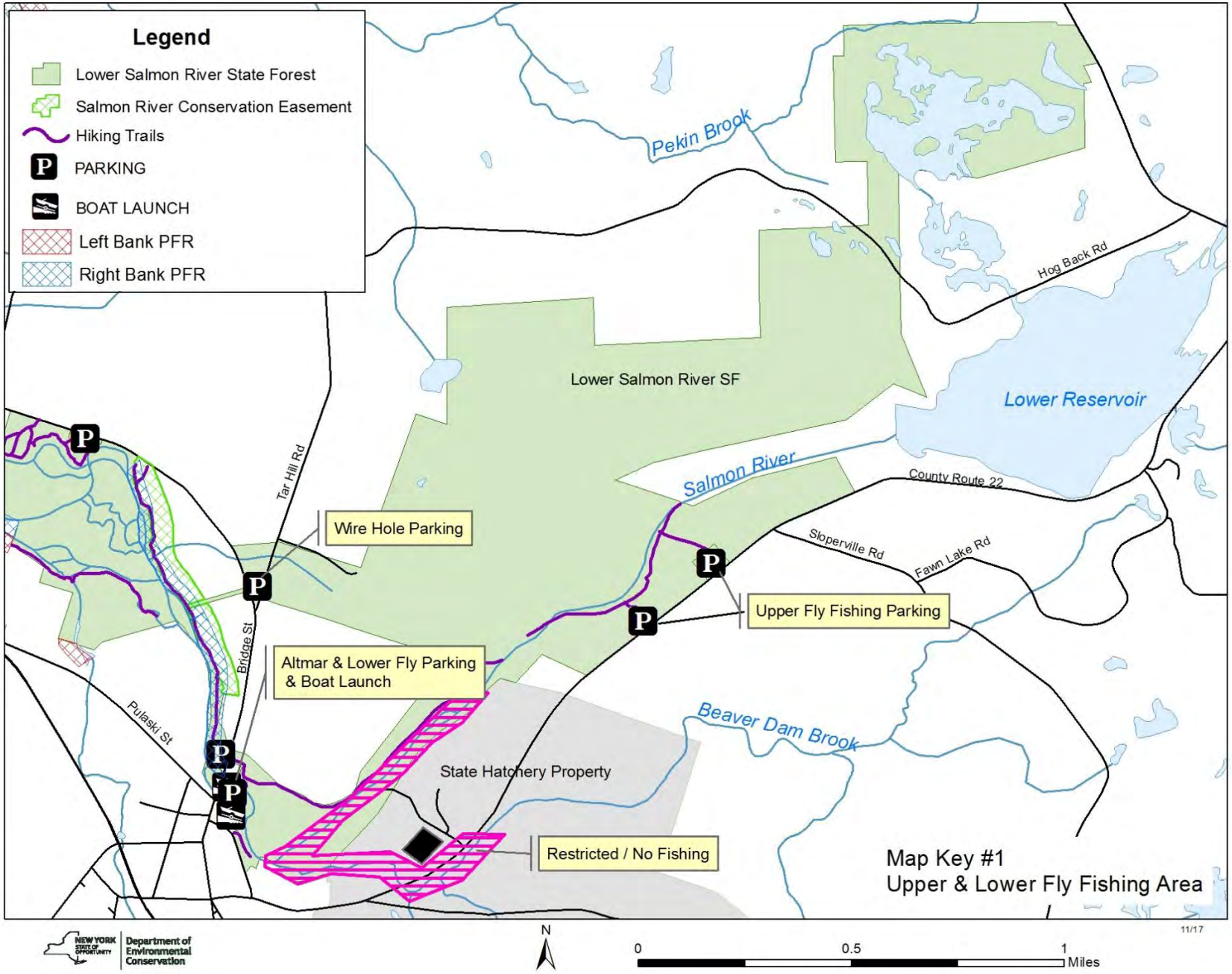


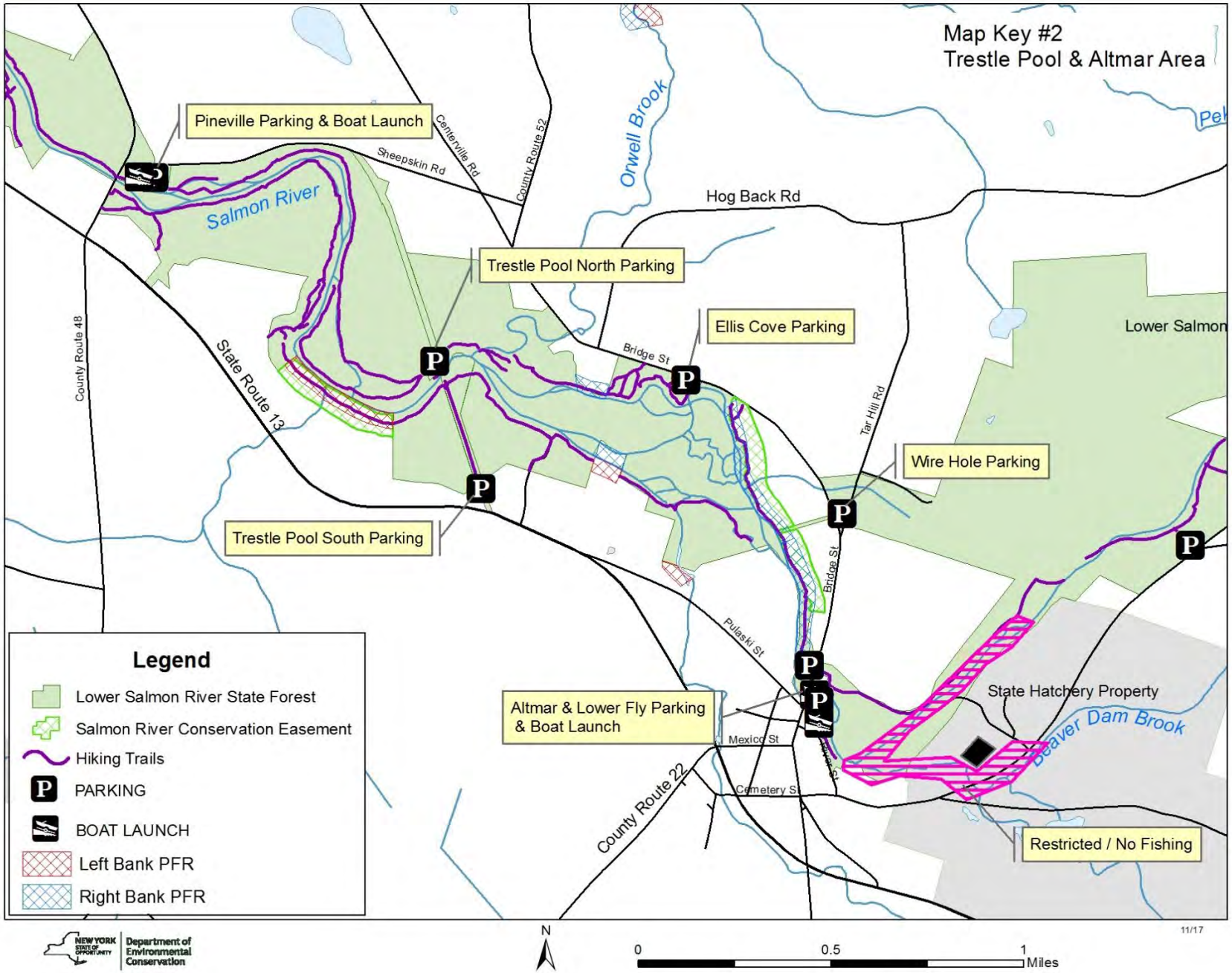
Three years post restoration

Appendix 4: Fishing Access Maps for the Lower Salmon River State Forest



Maps of the outlined areas are presented on the following pages.


Legend
Lower Salmon River State Forest
Salmon River Conservation Easement
Hiking Trails
PARKING
BOAT LAUNCH
Left Bank PFR
Right Bank PFR
Pekin Brook
Hog Back Rd
Lower Salmon River SF
Lower Reservoir
Salmon River
County Route 22
Sloperville Rd
Fawn Lake Rd
Tar Hill Rd
Wire Hole Parking
Bridge St
Upper Fly Fishing Parking
Altmar & Lower Fly Parking & Boat Launch
Pulaski St
Beaver Dam Brook
State Hatchery Property
Restricted / No Fishing
Map Key #1
Upper & Lower Fly Fishing Area
11/17
Department of Environmental Conservation
N
0
0.5
1
Miles


Map Key #2
Trestle Pool & Altmar Area
Pineville Parking & Boat Launch
Trestle Pool North Parking
Ellis Cove Parking
Wire Hole Parking
Trestle Pool South Parking
Altmar & Lower Fly Parking & Boat Launch
Restricted / No Fishing
Salmon River
Orwell Brook
Beaver Dam Brook
Hog Back Rd
Sheepskin Rd
Centerville Rd
County Route 52
County Route 48
State Route 13
Bridge St
Tar Hill Rd
Pulaski St
Mexico St
Cemetery St
County Route 22
State Hatchery Property
Lower Salmon
Legend
Lower Salmon River State Forest
Salmon River Conservation Easement
Hiking Trails
PARKING
BOAT LAUNCH
Left Bank PFR
Right Bank PFR
NEW YORK STATE OF OPPORTUNITY
Department of Environmental Conservation
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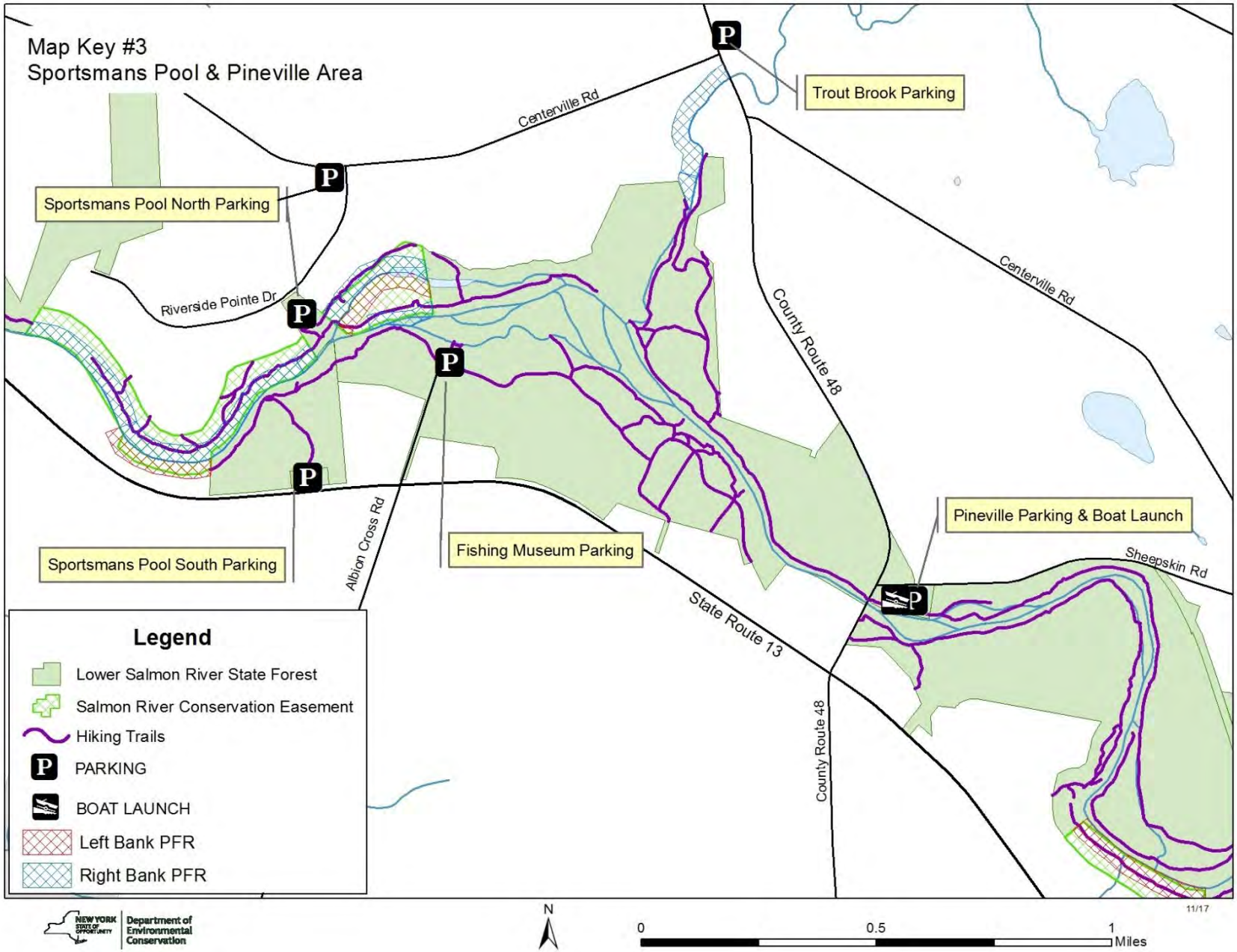
Map Key #3
Sportsmans Pool & Pineville Area
Trout Brook Parking
Centerville Rd
Sportsmans Pool North Parking
Riverside Pointe Dr
Centerville Rd
County Route 48
Albion Cross Rd
Fishing Museum Parking
Pineville Parking & Boat Launch
Sportsmans Pool South Parking
Sheepskin Rd
State Route 13
County Route 48
Legend
Lower Salmon River State Forest
Salmon River Conservation Easement
Hiking Trails
PARKING
BOAT LAUNCH
Left Bank PFR
Right Bank PFR
NEW YORK STATE OF OPPORTUNITY
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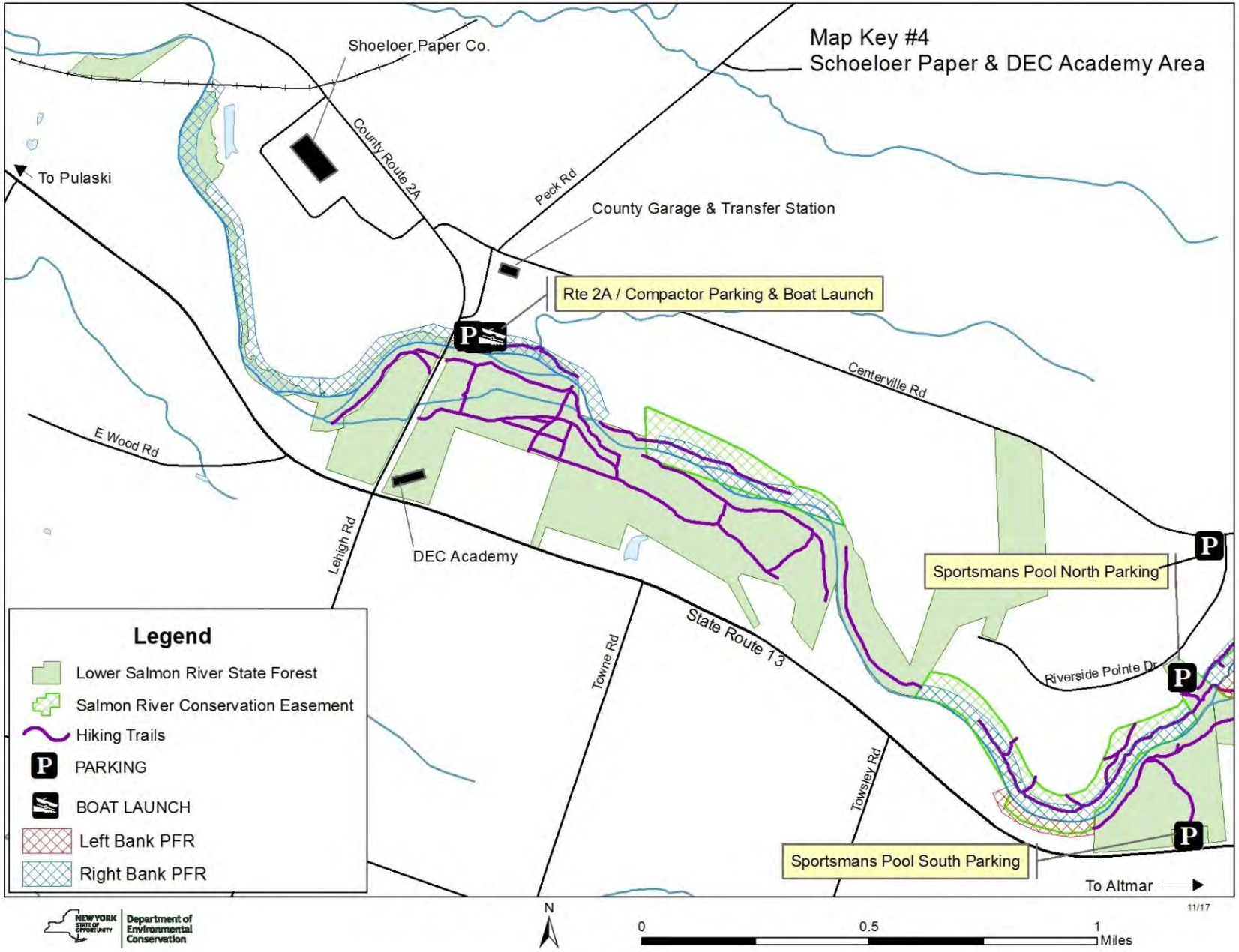
Map Key #4
Schoeloer Paper & DEC Academy Area
Shoeloer Paper Co.
County Route 2A
Peck Rd
To Pulaski
County Garage & Transfer Station
Rte 2A / Compactor Parking & Boat Launch
Centerville Rd
E Wood Rd
Lehigh Rd
DEC Academy
Sportsmans Pool North Parking
State Route 13
Towne Rd
Riverside Pointe Dr
Towsley Rd
Sportsmans Pool South Parking
To Altmar
Legend
Lower Salmon River State Forest
Salmon River Conservation Easement
Hiking Trails
PARKING
BOAT LAUNCH
Left Bank PFR
Right Bank PFR
NEW YORK STATE OF OPPORTUNITY
Department of Environmental Conservation
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Miles
11/17

Appendix 5: Summary of Consistency with New York State Coastal Management Policies

Waterfront Revitalization of Coastal Areas and Inland Waterways (19 NYCRR 600.5)

Development Policies

- The enhancement plan will advance cultural, commercial, and recreation uses of the River by increasing access and restoring/enhancing fisheries habitat and connectivity.

Fish and Wildlife Policies

- A core value and objective of the enhancement plan is to protect, preserve, and above all enhance the fishery habitat and associated NYS Regulated Freshwater Wetlands within the River corridor.
- The plan will expand recreational use of fish and wild resources by increasing access to the Salmon River through development of new, and enhancement of existing, trails and parking areas.

Agricultural Policies

- The plan will not result in a loss or impairment of important agricultural lands.

Scenic Quality Policies

- Per the NYSDOS Coastal Mapper the project area does not contain “Scenic Areas of Statewide Significance.”

Public Access Policies

- The plan protects, maintains, and increases public access to the resource through construction of new parking areas, rehabilitation of existing river access trail network, and construction of new river access trails.

Recreation Policies

- The plan encourages and enhances water dependent recreation by constructing new, and enhancing existing, angler and boater access and parking areas.

Flooding and Erosion Hazards Policies

- A core objective of the plan is to address and repair areas of active bank erosion along the Salmon River shoreline.
- The project area does not contain any “Natural Protective Feature” areas which are generally found along the Shoreline of Lake Ontario. The project site is greater than four miles upstream from Lake Ontario.

Water Resource Policies

- The project area is not within a Local Waterfront Revitalization Program area.
- Best Management Practices have been integrated into the plan to control stormwater runoff during construction.