

**New Jersey  
Department of Environmental Protection**



**An Evaluation of NJDEP's Category One  
Antidegradation Designation Process**

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## **Preface - Structure of this Document**

The New Jersey Department of Environmental Protection (NJDEP) began a review of its Category One (C1) designation process in the Surface Water Quality Standards (SWQS) regulations in late 2010. That review included taking another look at some C1 adoption decisions that were made in 2008. The Department has also developed a list of candidate waters for proposal to receive C1 protections. Section A of this document contains a general discussion of antidegradation policies and C1 waters. Section B contains an evaluation of the process and scientific criteria used in the designation of C1 waters. Section C concerns a separate review of decisions made by the Department in 2008 not to adopt C1 protections for 227 river miles and Section D discusses new candidate waters warranting C1 protections that will be subject to rulemaking.

## **A. Background: Antidegradation Policies and Category One (C1) Waters**

The Surface Water Quality Standards (SWQS) at N.J.A.C. 7:9B establish the designated uses and antidegradation categories for the State's surface waters, classify surface waters based on those uses (i.e., stream classifications), and specify the water quality criteria and other policies and provisions necessary to attain those designated uses. Designated uses include drinking water supply; fish consumption; shellfish resources; propagation, maintenance and migration of fish and wildlife; recreation in and on the water, and agricultural and industrial water supplies.

The surface water quality criteria are established to protect the designated uses. For each of the different stream classifications, surface water quality criteria are established either as numeric criteria defining parameter concentrations or narrative criteria that describe instream conditions to be attained/maintained or avoided. The SWQS also contain technical and general policies, including antidegradation policies and nutrient policies, to ensure that the designated uses are adequately protected.

Antidegradation policies require that all existing and designated uses must be maintained and protected for all surface waters of the State. Waters not achieving surface water quality criteria must be restored to meet them. Where the existing water quality is better than surface water quality criteria that higher level of water quality must be protected. The degree of protection varies depending on the antidegradation category of the waterbody:

- **Outstanding National Resource Waters:** The highest level of protection afforded to surface waters under the SWQS is applied to Outstanding National Resource Waters (ONRW), which includes surface waters classified as freshwater 1 (FW1) waters and Pinelands (PL) waters.
  - **FW1 waters:** Also known as nondegradation waters are set aside for posterity because of their unique ecological significance, exceptional recreational significance, exceptional water supply significance, or exceptional fisheries resources. Nondegradation waters are not to be subject to any manmade wastewater discharges. Activities that might alter existing water quality in FW1 waters are prohibited.
  - **PL waters:** Are to be maintained in their natural state and changes are allowed only toward natural water quality.
- **Category One (C1) Waters:** Are protected from any measurable change in water quality because of their exceptional ecological significance, exceptional recreational significance, exceptional water supply significance, or exceptional fisheries resources.
- **Category Two (C2) Waters:** All surface waters not designated as ONRW (i.e., FW1 or PL waters) or Category 1 waters are designated as Category Two (C2) waters. Similar to C1 waters, existing water quality is maintained in C2 waters.

However, some lowering of water quality is authorized to accommodate necessary and important social and economic development.

As of 2011, 44 percent of New Jersey's waters were protected at a C1 designation or higher level with 29 percent of the States waters designated as C1 waters and an additional 15 percent as ONRW (Figure 1).

The Department first designated C1 waters in 1985 based on their location in parks or wildlife management areas, as well as those identified as trout production waters, and approved shellfish waters. After 1985, additional streams upgraded to FW2-trout production were routinely designated as C1 waters. In 2002, the Department began an intensive effort to identify additional waters that warranted enhanced protections afforded by this designation. The Department adopted new C1 designation categories: Exceptional Ecological Significance, Exceptional Fisheries Resource(s), and Exceptional Water Supply Significance in order to clarify the data requirements necessary for a waterbody to be designated as C1 waters.

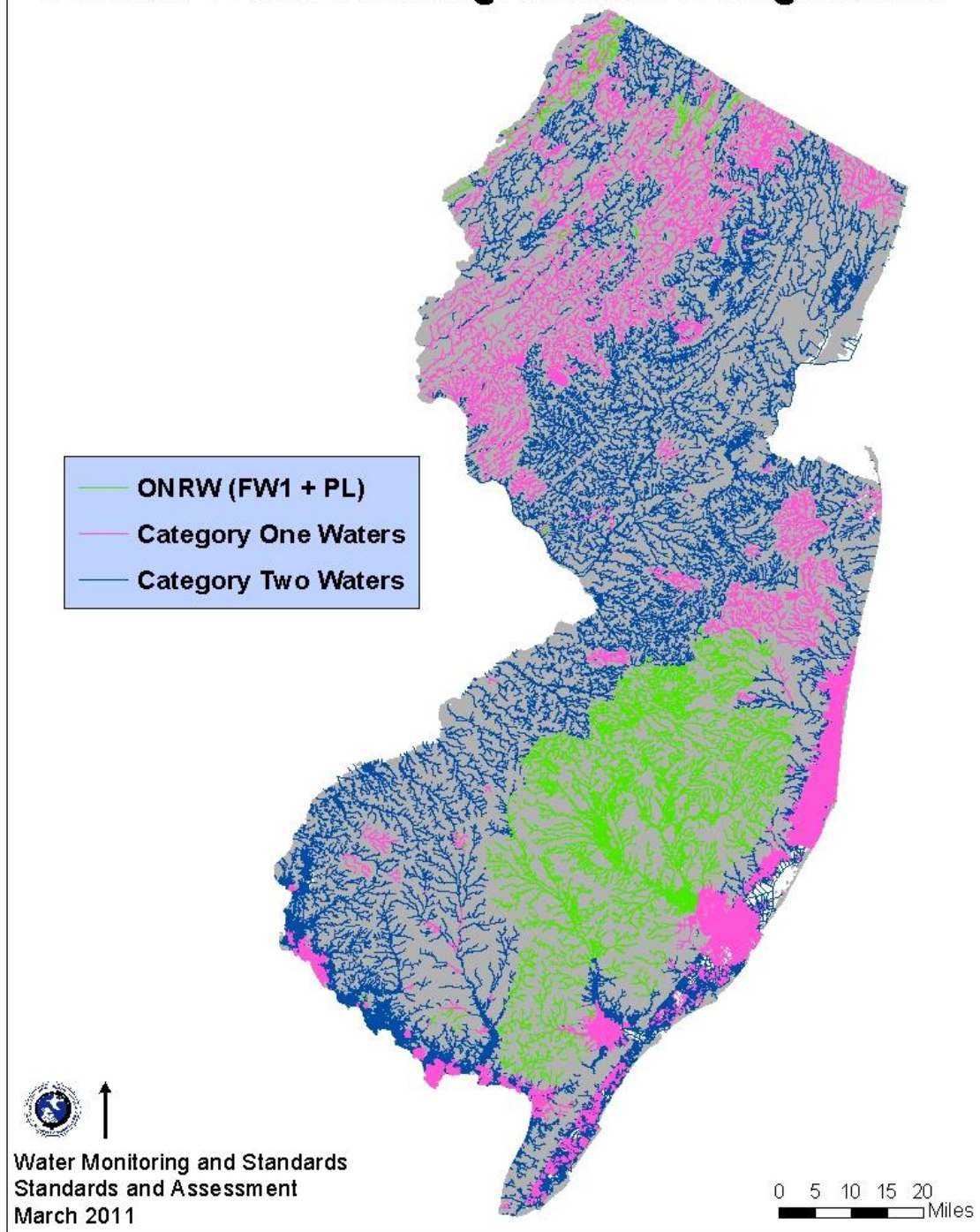
Under the definition of Exceptional Ecological Significance, those waterbodies with suitable habitat supporting certain aquatic dependent Threatened & Endangered (T&E) species (e.g.; bog turtles and mussels) or supporting an exceptional aquatic community can qualify for C1 designation. An exceptional aquatic community is demonstrated by a nonimpaired benthic macroinvertebrate community as measured by the Department's Rapid Bioassessment Protocol ([see http://www.state.nj.us/dep/wms/bfbm/rbpinfo.html](http://www.state.nj.us/dep/wms/bfbm/rbpinfo.html)) and at least two of the four following factors:

1. Optimal habitat as measured by the Department's Stream Habitat Assessment ([see http://www.state.nj.us/dep/wms/bfbm/rbpinfo.html](http://www.state.nj.us/dep/wms/bfbm/rbpinfo.html));
2. Excellent fish community as measured by the Fish Index of Biotic Integrity ([see http://www.state.nj.us/dep/wms/bfbm/fishibi.html](http://www.state.nj.us/dep/wms/bfbm/fishibi.html));
3. Water quality data that demonstrates compliance with aquatic life criteria pursuant to N.J.A.C. 7:9B-1.14(d) for dissolved oxygen, temperature, total phosphorus, and total suspended solids; or
4. Impervious surface that is:
  - a. less than two percent for a HUC 14 of five square miles; or
  - b. less than or equal to 10 percent for a HUC 14 of greater than or equal to five square miles.

Under the definition of Exceptional Fisheries Resource(s), trout production waters classified as FW2-TP and approved shellfish harvesting waters can qualify for C1 designation.

Under the definition of Exceptional Water Supply Significance, waterbodies that are part of the water supply system that serves a population greater than 100,000, including any reservoirs and streams that directly flow into those reservoirs can qualify for C1 designation.

## Surface Water Antidegradation Designations



**Figure 1**

## **B. Reviewing the Science: C1 Antidegradation Designation Process**

### **1. Stakeholder Discussions**

In keeping with the NJDEP's core transformation principles, this review of the C1 designation process is designed to be inclusive and transparent encouraging input from both internal and external stakeholders. An in-house internal stakeholder discussion was held on September 13, 2010. This was followed by a meeting with external stakeholders on December 10, 2010. As a starting point for a discussion of pros and cons regarding the existing C1 designation process, the stakeholders were asked for their responses to three questions:

1. Do you have any recommendations that would improve the existing C1 designation methodology?
2. What other ecological factors should the Department be considering when designating C1 waters?
3. What other types of data should the Department be considering when designating C1 waters?

From the stakeholder discussions several areas for the possible modification or enhancement of the scientific basis for the existing designation process were identified including:

- Clarifying the definition of "Measurable Change"
- Reevaluating "Marginally Qualified" Existing Designations
- Inclusion of Additional Indicators in the Designation Process

Following below is a brief description of each of the stakeholder recommendations and the Department's evaluation of them.

### **2. Implementation Issues**

During the December 10, 2010 external stakeholder meeting several different implementation issues were raised. These issues did not deal with the C1 designation process, but rather the implementation of antidegradation policies by other programs in the Department. These implementation issues are being addressed as part of ongoing evaluations and stakeholder processes for pertinent programs and rules.

### **3. Clarifying the Definition of "Measurable Change"**

The Surface Water Quality Standards (N.J.A.C. 7:9B-1.4) defines "Measurable changes" as "changes measured or determined by a biological, chemical, physical, or analytical method, conducted in accordance with USEPA approved methods as identified in 40 C.F.R. 136 or other analytical methods (for example, mathematical models, ecological indices)

approved by the Department, that might adversely impact a water use (including, but not limited to, aesthetics).” That definition is further clarified by the rule text describing Category 1 waters (N.J.A.C. 7:9B-1.5(d)2iii), which states “measurable changes (including calculable or predicted changes).”

Some of the stakeholders stated that what constitutes a “Measurable Change” for each of the C1 designation categories needs to be more transparent and clearly defined. It was suggested that “Measurable Change” should be defined based upon the context of the C1 designation category. In this way a change that did not result in an impact to the designated use would not be considered a “Measurable Change.”

While the Department is always open to explore ways to improve the clarity of its rules, this suggestion which would allow changes except those that would impact a designated use is inconsistent with the Federal antidegradation framework. The Department’s intention when creating C1 designation categories of Exceptional Ecological Significance, Exceptional Fisheries Resource(s), and Exceptional Water Supply Significance was to better clarify the data requirements necessary for a waterbody to be designated as a C1 water. However, once a waterbody is designated as C1, it becomes a high quality water under both State regulation (N.J.A.C. 7:9B) and the Federal Water Quality Standards Rules (40 C.F.R. 131.12). As such, where existing water quality is better than the water quality criteria that higher level of existing water quality is to be maintained and protected. Many of the issues raised by the stakeholders can be addressed through implementation decisions as part of Department issued permits, approvals, etc., rather than changing the regulatory structure or the scientific basis for the C1 regulations. For example, changes in method detection levels or short term impacts due to road repairs.

#### **4. Re-evaluating Existing Designations**

Recognizing that the Department’s designation process for C1 waters has improved over time, stakeholders asked if it were possible that the Department reevaluate certain existing designations particularly some of the older ones. As was described above, in 1985 waters were originally designated for C1 antidegradation protection based on either their location within “open space”, their being designated as trout production waters or their being approved for shellfish harvesting. From 1985 to 2002, waters were designated for C1 protections primarily based on their trout production status. Starting in 2003 to the present the Department developed and implemented a more robust definition of “Exceptional Ecological Significance”, as well as setting and implementing new definitions for “Exceptional Water Supply” and “Exceptional Fisheries Resource”.

The Department has gone back to evaluate what information was used to designate the C1 waters prior to 2003. Except for the mapped designation on the original USGS quad maps, little information is available for most C1 designations. Waters classified as FW2-TP(C1) were based on fisheries surveys conducted by the Division of Fish and Wildlife.



Waters designated as C1 based upon trout production would qualify based on the current rules for “exceptional fisheries resources”.

The modification of park, wildlife management, and forest boundaries since the time the original designation was made has in some cases created confusion as to what stream reaches are or are not currently designated as C1 waters. In part this was a result of the Department moving from using paper maps to GIS coverages for open space, which reflected updated boundaries. Also the descriptions in the SWQS are not always consistent, in some places the text uses language like “all waters within the park” and in others specific waters are listed. In some cases, these issues were addressed when designations for open space have been overlaid by a more recent valid basis. However, the Department has concluded that, as resources become available, those open space C1 designations, where the geographical boundaries have been adjusted since the original designations were made, need to be reviewed and where necessary new empirical evidence collected to determine if expanding the designations to the additional waters contained therein is justified under the current designation process.

Tools are now available to improve the access to available information on a C1 designation. To determine if a water is designated as C1 can be accomplished using either ArcView or NJGeoWeb. The basis for the C1 designation for waters designated after 2002 can be found in the archived copies of the proposed/adopted SWQS rule amendments available at [http://www.state.nj.us/dep/wms/bwqsa/rule\\_archives.htm](http://www.state.nj.us/dep/wms/bwqsa/rule_archives.htm). However, the basis for the designation is not included as part of the GIS shapefile.

As future C1 designations are made, the Department plans to include the basis for that designation as an attribute to the GIS shapefile. Having such information readily available via the GIS database should greatly enhance access to the information.

## **5. Inclusion of Additional Indicators in the Designation Process**

In considering the potential benefit of each suggested additional indicator to the existing C1 designation process, the fact that 44 percent of the State’s waters are already protected at a C1 level or higher is a factor. In each case, the Department evaluated the availability of data for the indicator, and the likelihood that the new indicator would enable designation in areas not served by the existing indicators. It’s also important to recognize that there are overlaps, sometimes significant, between some existing and suggested indicators, and in some cases between two suggested indicators. While the Department sees value in a multiple weight of evidence approach, ultimately the desired outcome is not necessarily a designation process in rule that includes every possible indicator, but rather identifying additional indicators that would fill gaps in the existing designation process resulting in an enhanced list of C1 designated waters.

a. Benthic Indices for Coastal Waters

The absence of benthic indices for ocean and estuarine waters has been identified as a gap, and the Department is monitoring/funding ongoing research to support their development. A benthic index is currently used as one of the necessary factors under the “Exceptional Ecological Significance” C1 designation category in freshwaters. Once Benthic Indices are developed for ocean and estuarine waters, the Department will evaluate whether rule revisions are needed to further refine the “Exceptional Ecological Significance” C1 designation category in SC and SE waters.

A major focus of the work in near shore ocean waters is to determine if the currently observed oxygen impairment is causing degradation to the benthic communities in coastal waters. Low dissolved oxygen conditions have been shown to be caused by natural upwelling events along the coast. If the event is of a natural cause and not of an extended duration, the biota may not be significantly impacted. If such is the case a re-evaluation of the existing dissolved oxygen criteria and resulting impaired listing may be called for.

b. T & E Species and Heritage Fish Populations

The Department is working to improve the C1 designation process, under the “Exceptional Ecological Significance” designation category, specifically the methodology for identifying surface water areas critical to the survival of T&E aquatic-dependent species. An aquatic-dependent species is an individual species that: 1) requires surface water (stream, lake, bay etc.) to carry out a critical life history requirement (e.g. breeding, egg deposition/birthing, overwintering, essential feeding source) that cannot be performed outside of the waterbody with a sustainable outcome or 2) an individual species with core habitat requirements that are directly influenced by a waterbody and the water quality therein. The Department has completed the updated Landscape Project mapping version 3.1 using an improved species-specific methodology. The resulting GIS-based mapping of potential areas for listed aquatic dependent T&E species will be used to prioritize critical stream segments for further investigation, including where necessary field verification and field surveys. Refined mapping of identified surface water areas will be used to make C1 designation decisions.

Streams with Heritage Fish populations have already been designated as C1. The Department may pursue enhanced protections for these streams; however, since they already have C1 protection that issue is beyond the scope of this review.

c. Fish index of biotic integrity (FIBI)

As was the case with benthic indices, gaps also exist concerning the availability of fish indices of biotic integrity (FIBI) to monitor the health of fish communities, which must be tailored to the water type and region in the State. The only FIBI method that has been available is applicable only to waters in the northern part of the state. The Department

has been working to develop FIBI methods tailored to other water types and regions with in the State. Work continues on a new FIBI method for monitoring southern NJ's Inner Coastal Plain rivers and streams (also see Headwater Streams).

d. Headwater Streams

Early C1 designations included freshwater headwater reaches if they were within the boundaries of the parks or wildlife management areas or trout production waters being designated. The Department recognized that more attention should be given to headwater reaches, but until recently was limited by the available tools for biological monitoring and assessment available for these waters. The Department continues to work with researchers to refine tools and metrics for headwaters for both benthic macroinvertebrates and the Fish Index of Biologic Integrity (FIBI).

e. "Wild and Scenic River" and "Aquatic Trail" Designations

In 1968 Congress created the National Wild and Scenic Rivers System (Public Law 90-542; 16 U.S.C. 1271 et. seq.) to preserve certain rivers with outstanding cultural, natural, and recreational values in a free-flowing condition for the enjoyment of present and future generations. The Act is notable for safeguarding the special character of these rivers, while also recognizing the potential for their appropriate use and development (emphasis added).

Rivers may be designated by Congress or, if certain requirements are met, the Secretary of the Interior. Designated segments need not include the entire river and may include tributaries.

Rivers are classified as wild, scenic, or recreational.

- Wild river areas - those rivers or sections of rivers that are free of impoundments and generally inaccessible except by trail, with watersheds or shorelines essentially primitive and waters unpolluted.
- Scenic river areas - those rivers or sections of rivers that are free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads.
- Recreational river areas - Those rivers or sections of rivers that are readily accessible by road or railroad, that may have some development along their shorelines, and that may have undergone some impoundment or diversion in the past.

At this time there are five New Jersey waters which have received the "Wild and Scenic" designation. They are listed below with their Wild & Scenic Rivers classifications:

- a. The "Middle" Delaware River - Scenic
- b. The "Lower" Delaware River - Scenic, Recreational

- c. Musconetcong River (two segments) - Scenic, Recreational
- d. Maurice River (one segment) and some of its tributaries - Scenic, Recreational
- e. Great Egg Harbor River and some of its tributaries - Scenic, Recreational

Most of the Musconetcong River is already designated as C1. Portions of the Maurice River (and some tributaries) and certain portions of Great Egg Harbor River tributaries are also designated C1. The “Middle” and “Lower” Delaware Rivers have been designated as Special Protection Waters by the Delaware River Basin Commission (DRBC) and receive protection as high quality waters under that designation.

Regardless of its classification, each river in the National System is administered with the goal of protecting and enhancing the values that caused it to be designated. Designation neither prohibits development nor gives the federal government control over private property. Recreation, agricultural practices, residential development, and other uses may continue.

Except for those rivers designated as “Wild” under this system, the Act does not specifically deal with water quality issues and most particularly the prevention of degradation from an established water quality baseline. As such, waters with “Scenic” or “Recreational” designations would not be suitable potential indicators for inclusion in the C1 designation process under either the “Exceptional Ecological Significance” or the “Exceptional Fisheries” categories.

None of the New Jersey waters that have received “Wild and Scenic” designations to date have done so under the “Wild” classification. Since the “Wild” river classification includes “waters unpolluted” as a criteria, it could be considered as a potential indicator for evaluation under the “Exceptional Ecological Significance” C1 designation category. However, the remaining criteria for the “Wild” classification (i.e., free of impoundments and generally inaccessible except by trail, with watersheds or shorelines essentially primitive) are very restrictive and its inclusion in the C1 designation process would not likely have a meaningful practical impact due to the nature of the State and the large number of waters that have already been designated.

While waters designated as either “Scenic” or “Recreational” rivers might seem a better fit under the yet to be defined “Exceptional Recreational Significance” C1 designation category, it must again be noted the Act does not specifically deal with water quality issues and most particularly the prevention of degradation from an established water quality baseline. The “Exceptional Recreational Significance” C1 designation category has not been used for making C1 designations to date.

Similarly, some of the stakeholders suggested the Department consider those waters that had been designated as “Aquatic Trails” be included as an indicator under the C1 designation process. In reviewing the creation of the “Aquatic Trails” designation there does not appear to be any objective standards upon which to rate the quality of a given trail, or even to compare one trail to another. Furthermore, there does not seem to be any correlation between the establishment of an aquatic trail and the existing water quality,

though clearly the more pristine the water and riparian setting the more likely there will be an interest in establishing such a trail. In the end, the mere presence of an established aquatic trail designation, while it might be useful information in the evaluation of a waterbody for a C1 designation based upon the “Exceptional Recreational Significance” C1 designation category, it would not be a definitive decision point.

f. NOAA’s “Essential Fish Habitat” program for Coastal Waters and Bays

Yet another Federal designation, the NOAA, Essential Fish Habitat (EFH) program focuses on the approximately 1,000 species managed in Fishery Management Plans under the Magnuson-Stevens Fishery Conservation and Management Act. Essential Fish Habitat is the habitat necessary for managed fish to complete their life cycle, thus contributing to a fishery that can be harvested sustainably. The National Marine Fisheries Service (NMFS) has interpreted through regulation that EFH must be described and identified for each federally managed species at all life stages for which information is available.

Essential Fish Habitat must be described and identified in Fishery Management Plans. In 2002, NMFS began to require that the plans also contain maps of EFH. NOAA has launched the latest version of the EFH Mapper v2.0 and EFH data inventory; it can be found on-line at: <http://www.habitat.noaa.gov/protection/efh/habitatmapper.html>. This “mapper” gives users newly available data on EFH areas protected from fishing.

While the identification of EFH by the NMFS is not directly related to water quality, such a designation may prove useful in the consideration of coastal waters / estuaries / embayments for C1 protections on the basis of either “Exceptional Ecological Significance” or “Exceptional Fisheries Resource” C1 designation categories. It would be necessary to work collaboratively with both the NMFS and the DFW to identify which species would be most appropriate for NJ waters. However, it is important to point out that many of NJ’s coastal waters and bays are already designated as C1, so this change in designation process is not likely to have a significant practical impact.

g. SAV Characterizations for Estuarine Waters

Submerged aquatic vegetation (SAV), primarily eelgrass (*Zostera marina*) and widgeon grass (*Ruppia maritima*), is an important component of the Barnegat Bay-Little Egg Harbor ecosystem. It serves as an important habitat for benthic epifauna and infauna (aquatic animals living on or within the bottom) indigenous to the bay. While some organisms feed on the SAV (e.g., gastropods, fish, duck, and muskrats) for others, such as finfish, the eelgrass provides valuable spawning, nursery and feeding grounds. SAV also stabilizes the benthic habitat by buffering the waves and currents and ameliorating substrate erosion. A description of the SAV investigations recently conducted by Rutgers University can be viewed at: <http://crssa.rutgers.edu/projects/runj/sav/index.htm> in the

form of spatial and temporal mapping of SAV distribution in the Barnegat Bay-Little Egg Harbor.

An evaluation of the work being done by Rutgers University in the Barnegat Bay-Little Egg Harbor, along with the work done in other estuaries such as Chesapeake Bay, may suggest a scaled ranking system for evaluating waters on the basis of SAV bed condition. If so the output from such a ranking could then be used in a multiple weight of evidence approach under the “Exceptional Ecological Significance” category. However, eelgrass is found mostly within the Barnegat estuary, which is already designated C1 waters, and is not a common biotic component in other New Jersey estuaries. Its limited geographic range in New Jersey limits its value as an indicator in a Statewide C1 designation process.

#### **h. Pathogen Indicator for Recreational Waters**

Stakeholders questioned why the Department isn’t utilizing the “Exceptional Recreational Significance” C1 designation category, and suggested that an indicator be developed based upon the pathogen criterion for Primary Contact Recreation. The Department acknowledges that the “Exceptional Recreational Significance” category is the least developed of the four categories, it is not defined and there are no specific indicators. Regarding the suggested use of the pathogen (i.e., bacterial water quality) criterion for Primary Contact Recreation as an indicator, all surface waters classifications, except SE2 and SE3 waters, are designated for primary contact recreation and bacterial water quality criterion to protect that use already apply to them. However, many of the waters designated for primary contact recreation do not support this use due to natural conditions – too shallow, intermittent, lack of access, and/or safety concerns. In addition to the reasons above, since all surface water quality criteria in the SWQS should be achieved, the Department does not believe it would be appropriate to designate waters as having “exceptional significance” for any category based on achieving any particular surface water quality criterion. The Department will continue to explore approaches to further develop the “Exceptional Recreational Significance” category.

### **C. Review of 2008 C1 Adoption Decisions**

On May 21, 2007, the Department proposed amendments to the Surface Water Quality Standards, N.J.A.C. 7:9B et. seq., at 39 N.J.R. 1845(a), concerning Category One (C1) waters. As part of that proposal 909.5 river miles were proposed for C1 protection based on exceptional ecological significance – endangered and threatened species. The Department when adopting the amendments on June 16, 2008 (40 N.J.R. 3630(b)), adopted C1 designations, based on exceptional ecological significance – endangered and threatened species, for only 682.5 river miles of the 909.5 river miles proposed. The 227 river miles for which C1 protections were not adopted have been the subject of much criticism directed at the Department, and misunderstanding on the part of the public. In

response, the Department agreed to review the 2008 C1 adoption decisions made relative to the subject 227 river miles.

The Department in making decisions about C1 protection for stream segments based on exceptional ecological significance – endangered and threatened species, largely depends on survey data collected by the Division of Fish and Wildlife (DFW). In conducting this review, the Department verified that it utilized the most current survey data that was available at the time the 2008 decision was made. It also reviewed the reason the decision was made in 2008 not to adopt these segments, as described in the response to comments (RTC) in the adoption document (40 N.J.R. 3630(b)). Finally, it determined if that decision was consistent with the definition of “Category one waters” and paragraph 1 of the definition of “Exceptional ecological significance” at N.J.A.C. 7:9B-1.4. Table 1 lists the waterbodies that were proposed in 2007 for C1 protection based on exceptional ecological significance – endangered and threatened species, including the number of river miles proposed and adopted, as well as the basis in the proposal for the designation. The 909.5 river miles proposed included segments from 20 waterbodies (plus tributaries). The 227 river miles that were not adopted included segments from 4 waterbodies (plus tributaries). The locations of the 2007 proposed and 2008 adopted waterbodies are shown in Figures 2 and 3, respectively.

For each of the four waterbodies where C1 protections were not adopted in 2008, Table 2 lists the justification for not adopting, the number of the relevant RTCs and their New Jersey Register (NJR) citation. The specifics for each of the four waterbodies are briefly described below:

Black Creek – The Department proposed 18 river miles within Black Creek and adopted zero river miles based on Triangle Floaters and Bog Turtles. Public comments received included Comment 394, which stated that the Landscape Maps used by the Department did not designate specific locations in Black Creek as either Bog Turtle Habitat or Triangle Floater Habitat. As a result of that comment, the Department rechecked the available habitat information for Black Creek and determined that the commenter was correct. While Triangle Floaters and Bog Turtles are present in the existing C1 portion of Pochuck Creek, the Department had no information that they occur in the proposed Black Creek segment, upstream of the confluence with Pochuck Creek.

Wallkill River and Tributaries - The Department proposed 257 river miles within the Wallkill River and Tributaries and adopted 106 river miles. Species supporting the C1 designation included Bog Turtles, Eastern Lampmussel and Triangle Floaters. Among the public comments received, Comments 392 and 396 requested “verification of the necessary and required documented occurrence(s) and location and spatial extent for the Bog Turtle, Eastern Lampmussel and Triangle floater” and stated that “there is no science or documentation available that verifies that there are actual occurrences of the species within these areas,” respectively. The Department determined that based on the nature of Bog Turtle habitat, that while suitable habitat may exist throughout the Wallkill River watershed, some of the proposed stream segments did not actually intersect with suitable habitat for bog turtle. As a result, the Department reevaluated the habitat mapped as suitable for bog turtle in the Landscape Project to determine whether a stream intersected

with documented, occupied habitat. Based on this warranted refinement, the Department determined that only portions of the Wallkill River adopted in 2008 qualified for C1 designation. For the 151 river miles where C1 designations were not adopted, in addition to the Bog Turtle habitat issue, the available data did not substantiate the presence of the Eastern Lampmussel or Triangle Floaters.

Pequest River and Tributaries - The Department proposed 57 river miles within the Pequest River and Tributaries and adopted 30 river miles. This designation was based solely on the presence of Bog Turtle. While the Department received no specific comment on the Pequest River regarding the Bog Turtles, as a result of the comments received about Bog Turtles in the Wallkill River the Department reevaluated the spatial extent of suitable habitat for bog turtles in all proposed waterbodies. The Department determined portions of the Pequest River (and tributaries) which had been proposed, did not intersect with suitable habitat for bog turtle and therefore did not qualify for C1 based upon exceptional ecological significance.

Stony Brook - The Department proposed 42 river miles within the Stony Brook and adopted 11 river miles. This designation was based on the presences of several freshwater mussel species including the Brook Floater, Triangle Floater, Eastern Pondmussel and Green Floater. Among the public comments received, Comments 340 and 341 raised questions about the adequacy of the described upstream starting point and downstream end point for the segment as well as questions about the habitat conditions. As a result of the comments, the Department determined it was necessary to conduct additional field surveys to verify sightings, and to determine if suitable habitat was still present in the portion of the Stony Brook proposed for C1 designation. This was especially important as some of the endangered or threatened species sightings data used for the proposal were more than 10 years old. As a result, the Stony Brook was reevaluated to confirm the extent of C1 designation, which resulted in the decision to adopt C1 protections for only 11 of the 42 miles proposed.

As part of this review, any additional survey work that has been done since 2008 in the four streams (Black Creek, Wallkill River, Pequest River, and Stony Brook) was also considered, to see if there was any new information that might result in the Department reconsidering the determinations made as part of the 2008 C1 adoption. Based on information presently available no additional C1 designations, based on endangered and threatened species, are warranted for any of 227 river miles where C1 protections were not adopted in 2008. However, 36 of those 227 river miles, which are tributaries to the Wallkill River (i.e., Clove Brook and West Branch Papakating Creek), are currently candidate waters to receive C1 protection, based on Exceptional Ecological Significance – exceptional aquatic community (see Section D).



**Table 1: Proposed and Adopted Category One Waters – 2008:  
Ecological Significance – Endangered and Threatened Species**

<b>Name of the Waterbody</b>	<b>Proposed River Miles</b>	<b>Adopted River Miles</b>	<b>Basis for C1 Designation Proposal</b>
Black Creek	18	0	Triangle Floater, Bog Turtle
Lamington River	16	16	Brook Floater
Lubbers Run	1.5	1.5	Triangle Floater
Maurice River	3	3	Eastern Pondmussel
Musconetcong River and tributaries	43	43	Benthic macroinvertebrates, habitat, FIBI, impervious surface, & chemistry
	27	27	Triangle Floater
Oldmans Creek	22	22	Bog Turtle, Triangle Floater
Pequannock River, Canistear Reservoir, Oak Ridge Reservoir, and tributaries	26	26	Newark Water Department (serves 275,000 people)
	2	2	Brown Trout
Pequest River and tributaries	57	30	Bog Turtle
Pompeston Creek	3	3	Eastern Pondmussel, Bog Turtle
Ramapo River	3	3	Eastern Lampmussel, Triangle Floater
Rockaway River, Split Rock Reservoir, and tributaries	172	172	United Water Jersey City (serves 229,000 people)
Salem River	20	20	Bog Turtle
Stony Brook	42	11	Brook Floater, Triangle Floater, Eastern Pondmussel, Green Floater
Swimming River Res. tributaries	122	122	New Jersey American Water Company (serves 302,000 people)
Toms River and tributaries	51	51	Benthic macroinvertebrates, habitat & chemistry
Wallkill River and tributaries	257	106	Bog Turtle, Eastern Lampmussel, Triangle Floater
Wanaque Res. tributaries	24	24	North Jersey District Water Supply Commission (serves 1,000,000 people)

**Table 2: Justification for Not Adopting Certain Segments**

<b>Name of the Waterbody</b>	<b>Proposed River Miles</b>	<b>Adopted River Miles</b>	<b>Basis for C1 Designation Proposal</b>	<b>Justification for Not Adopting</b>	<b>N.J.R. Citation</b>
Black Creek	18	0	Triangle Floater, Bog Turtle	Triangle Floaters, Bog Turtles not present Black Creek segment upstream of the confluence with Pochuck Creek.	40 N.J.R. 3699. Response to comment 388 – 397.
Pequest River and tributaries	57	30	Bog Turtle	Several proposed stream segments did not intersect with documented suitable bog turtle habitat.	40 N.J.R. 3690. Response to comment 320 – 321.
Stony Brook	42	11	Brook Floater, Triangle Floater, Eastern Pondmussel, Green Floater	10 years old data needed reevaluation. Revisiting the area determined less suitable habitat and no documented sightings.	40 N.J.R. 3692. Response to comment 340 – 341.
Wallkill River and tributaries	257	106	Bog Turtle, Eastern Lampmussel, Triangle Floater	Several proposed stream segments did not intersect with documented suitable bog turtle habitat.	40 N.J.R. 3699. Response to comment 388 – 397.

## Proposed Category One Waters - 2007

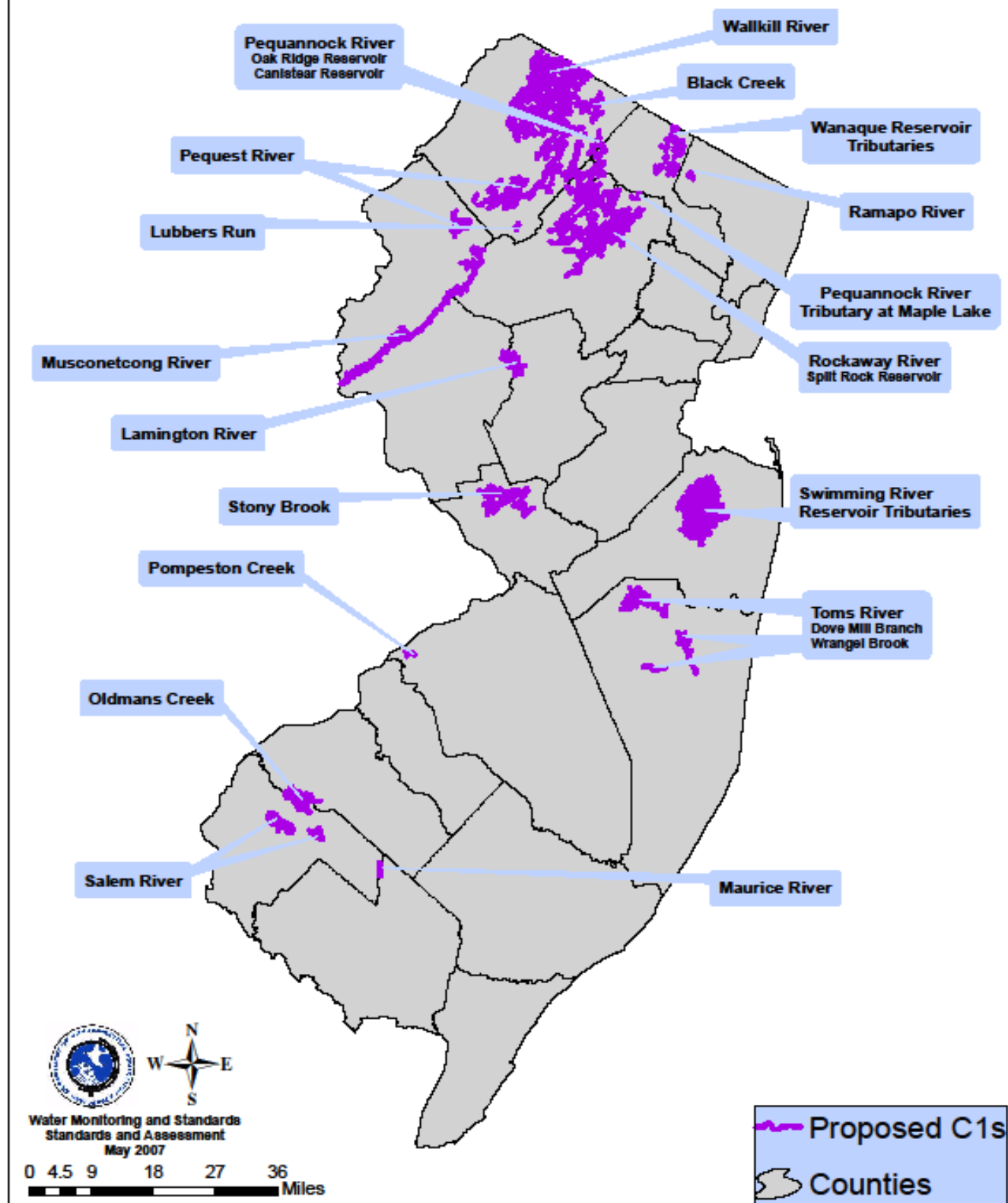
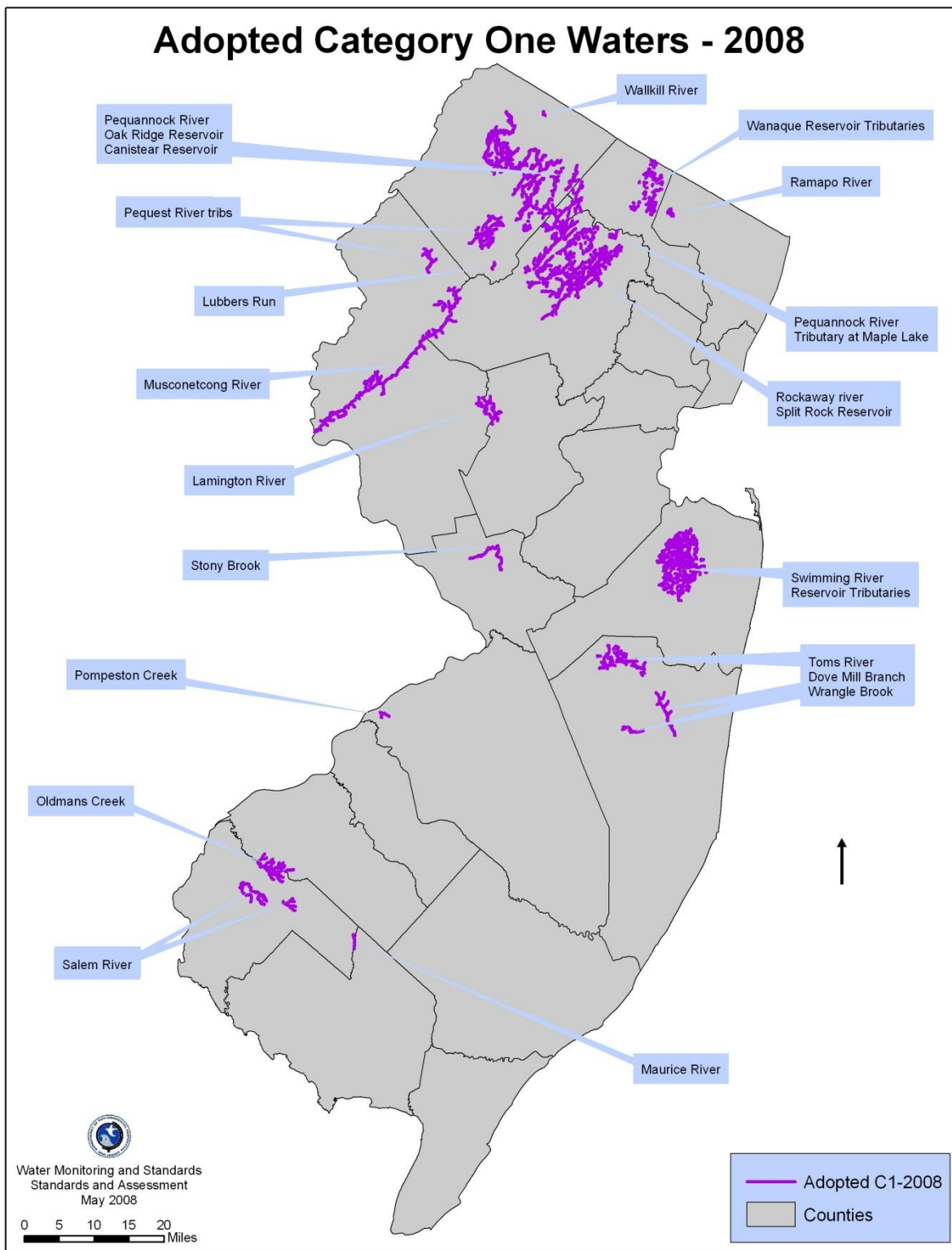


Figure 2



**Figure 3**

## **D. Identification of New Candidate Waters - 2012**

The Department continues to work to identify additional waters warranting C1 protections. Waterbodies are evaluated using the provisions in the C1 Waters definition from the Surface Water Quality Standards, N.J.A.C. 7:9B.

During the data evaluation process to develop the 2012 New Jersey Integrated Water Quality Monitoring and Assessment Report (Integrated Report) a group of waterbodies were identified that possibly would qualify for C1 designation under the Exceptional Ecological Significance, exceptional aquatic community category. Based on further review a candidate list of recommended waterbodies totaling 111 river miles has been developed.

In addition, data developed over the last three years by the Department's Division of Fish and Wildlife through trout surveys have identified approximately 10 river miles meet the Trout Production status and thus are candidate waters recommended for C1 designation based on the definition of the Exceptional Fisheries Resources category.

In total 121 river miles have been identified as recommended candidate waters to receive C1 protections based on the Exceptional Ecological Significance or the Exceptional Fisheries Resources categories. Candidate waters will need to go through the formal rulemaking process to receive C1 designation. The recommended candidate waters are identified in Table 3 and Figure 4. Detailed information on each candidate waterbody is included in Figures 5 through Figure 22.

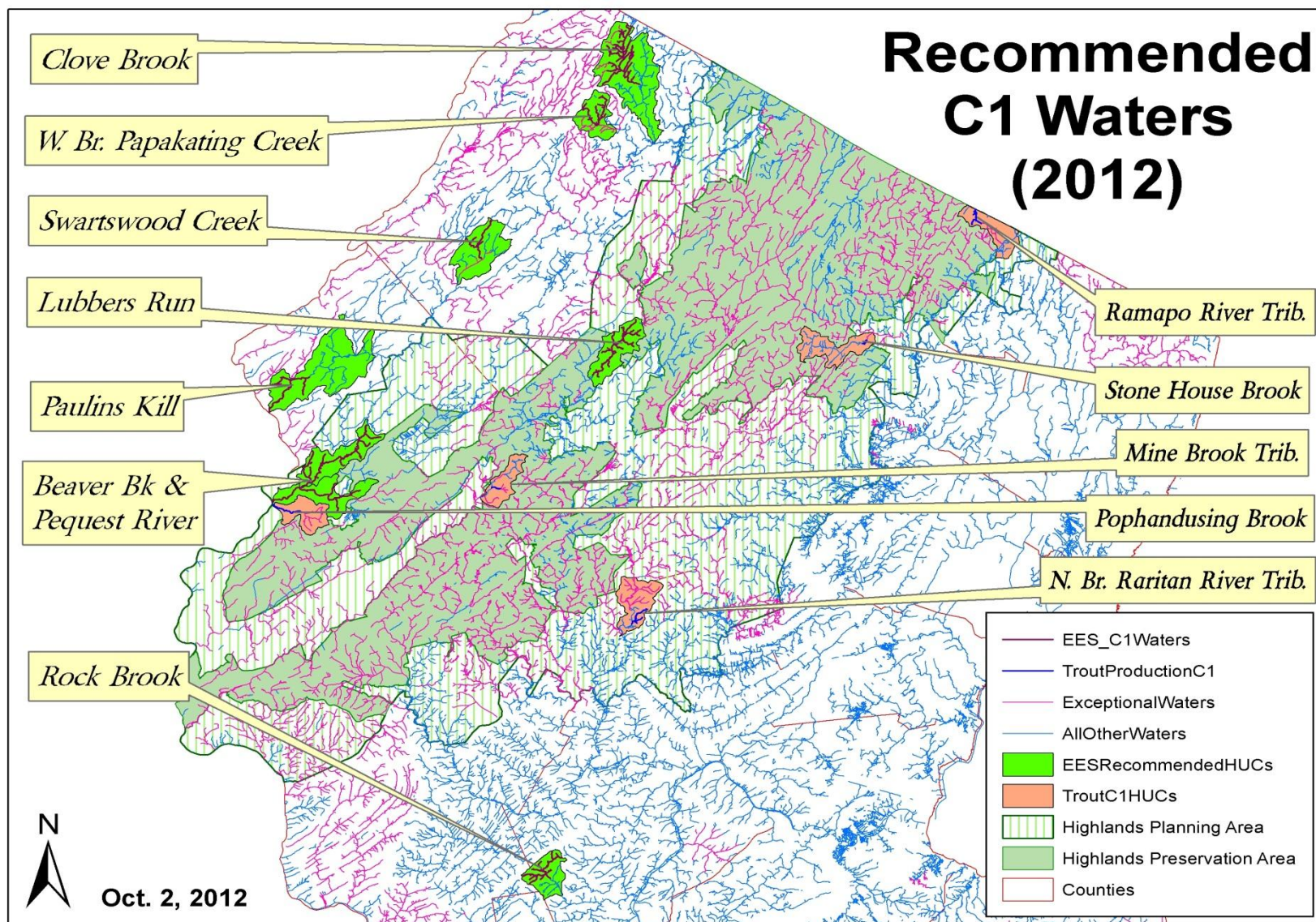
**Table 3: 2012 Recommended Category One Waters**

(~121 River Miles out of 23,521 total RMs of which 13,063 are C2 RMs)

Stream Name	River Miles	New buffers applicable Miles	Counties	Municipalities	Basis for C1 Upgrade
<b>Upper Delaware River Basin</b>					
Beaver Brook	20	20	Warren	White Township, Belvidere	EES
Lubbers Run	17.7	17.7	Sussex	Byram, Hopatcong, Sparta	EES
Mine Brook tributary	0.7	0.7	Morris	Washington Township	Trout
Paulins Kill	6.5	35.6	Warren	Knowlton	EES
Pequest River	12	12	Warren	White Township	EES
Pophandusing Brook	2.4	2.4	White	Warren	Trout
Swartwood Creek	6.5	N/A	Sussex	Hampton, Stillwater	EES
<b>Passaic, Hackensack, New York Harbor Complex Basin</b>					
Ramapo River tributary	2.6	N/A	Bergen	Mahwah	Trout
Stone House Brook	0.8	N/A	Morris	Butler Borough	Trout
<b>Upper Raritan River Basin</b>					
Raritan River, North Branch, tributary	3.2	3.2	Somerset	Far Hills, Bernardsville	Trout
Rock Brook	12.7	12.7	Hunterdon, Somerset	East Amwell, Hillsborough, Montgomery	EES
<b>Wallkill River Basin</b>					
Clove Brook	27	27	Sussex	Wantage	EES
W. Br. Papakating Creek	9.1	N/A	Sussex	Wantage	EES

EES     Exceptional Ecological Significance



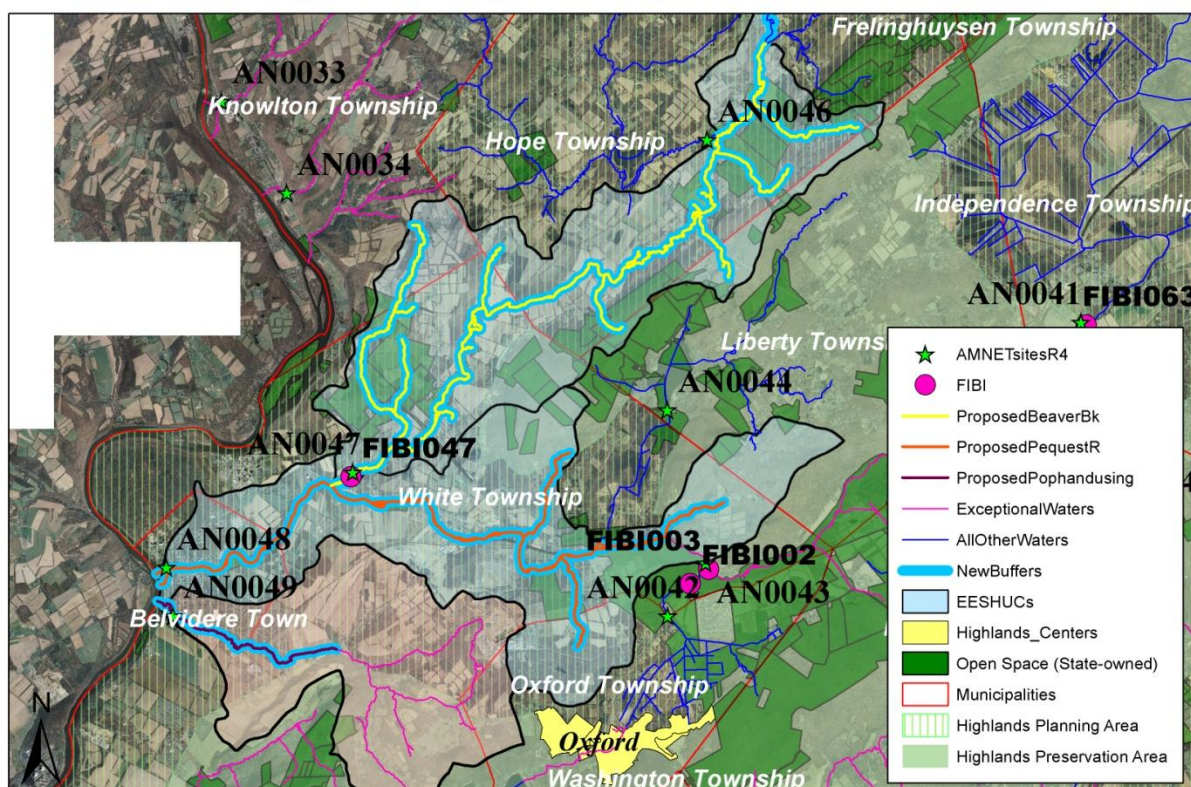


**Figure 4**



Figure 5

## Beaver Brook & Pequest River (EES) Pophandusing Brook (Trout Production)



**Proposed Category One Waters Based on Exceptional Ecological Significance**  
(Minimum three required qualifying factors in **bold**)

Stream Name	River miles	AMNET Station	AMNET Rating	Habitat Rating	Water Quality	Fish Index	HUC14 Square miles	HUC14 % Impervious Cover (2007)
Beaver Brook	20	AN0047	<b>Excellent</b>	<b>Optimal</b>	<b>Fully supporting</b>	FIBI047 Good	<b>9</b>	<b>1</b>
Pequest River	12	AN0048	<b>Excellent</b>	<b>Optimal</b>	Temperature	N/A	<b>8.3</b>	<b>5</b>

**Beaver Brook** – AN0046 did not qualify for C1 upgrade which is located on a tributary and a different HUC.

**Pequest River** - AN0043 is located on segment of Pequest that is already designated as C1. AN0042 did not qualify for C1 upgrade which is located on a tributary and a different HUC.

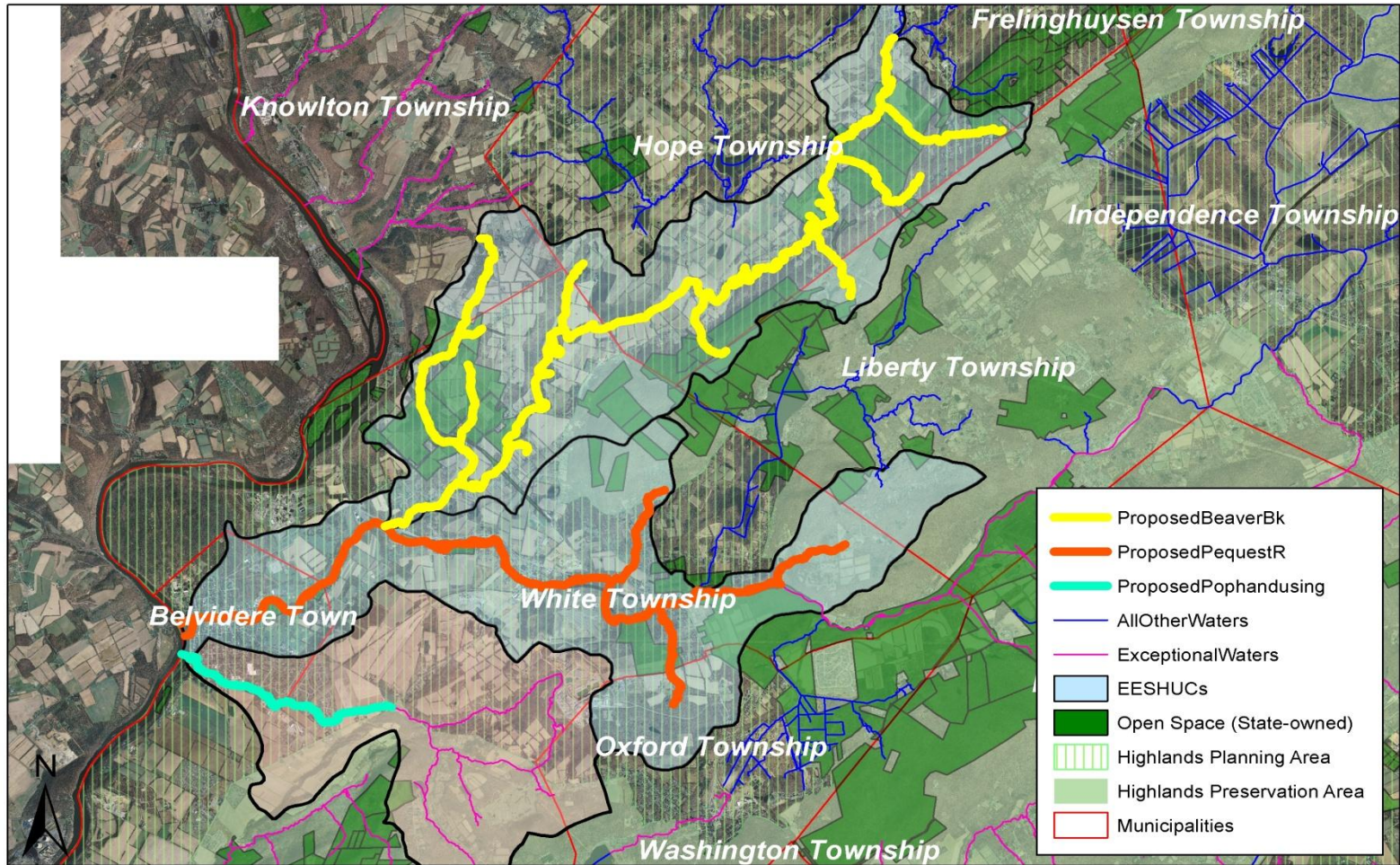
Based on the data available on the Highlands Council webpage, Oxford Township is a Designated Highlands Center, however, it will not be affected by the proposed C1 waters because the Township is located on a different waterbody. In addition, proposed C1 waters of Beaver Brook and Pequest River are located within high watershed value area.

**Proposed Category One Waters Based on Exceptional Fisheries Resource (Trout Production)**

Stream Segment	Current classification	Proposed classification	Young of the year (trout species)	River miles
Pophandusing Brook (Belvidere) – Route 519 Bridge to Delaware River	FW2-TM	FW2-TP(C1)	Brown trout	2.4



## Beaver Brook & Pequest River (EES) Pophandusing Brook (Trout Production)



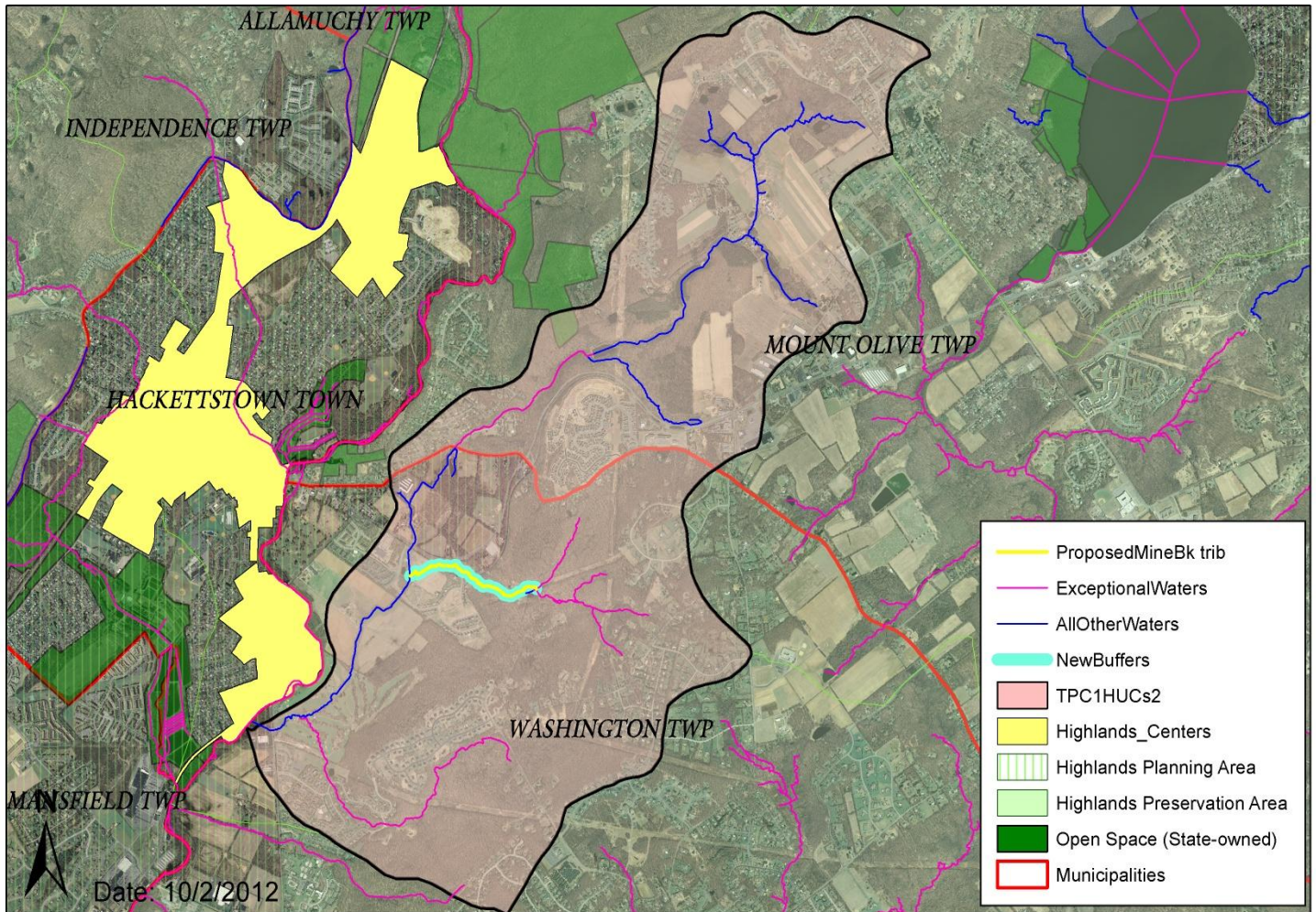
**Figure 6**



Figure 7

# Mine Brook Tributary

(Trout upgrade)



## Proposed Category One Waters Based on Exceptional Fisheries Resource

(Trout Production)

Stream Segment	Current classification	Proposed classification	Young of the year (trout species)	River miles
Mine Brook tributary (Drakestown) – Entire length	FW2-TM	FW2-TP(C1)	Brook trout	0.7

Based on the data available on the Highlands Council webpage, Hackettstown is a designated Highland Center, however, it will not be affected by the proposed C1 waters because the Township is located downstream and in a different HUC.



# Mine Brook Tributary

(Trout upgrade)

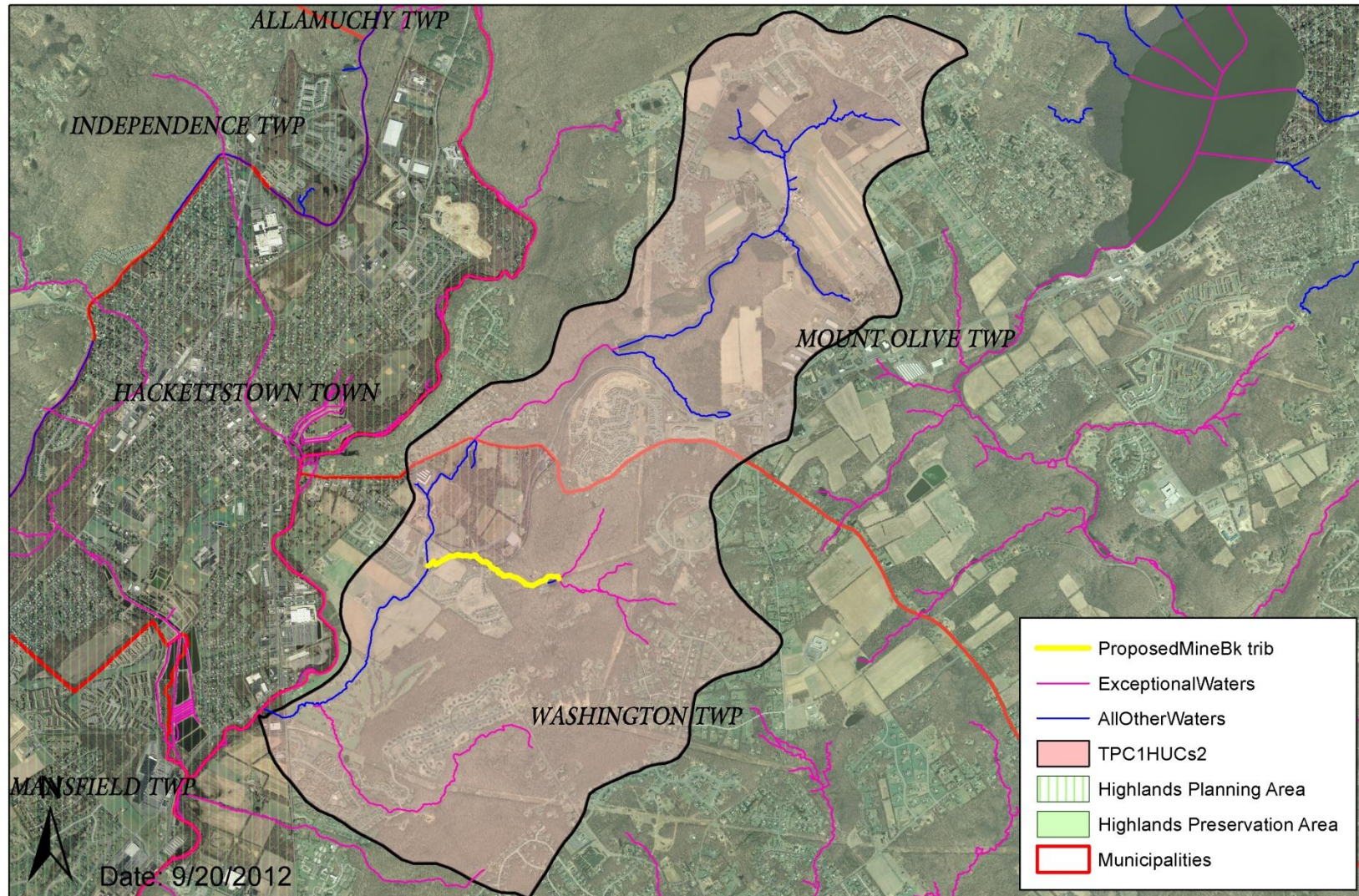
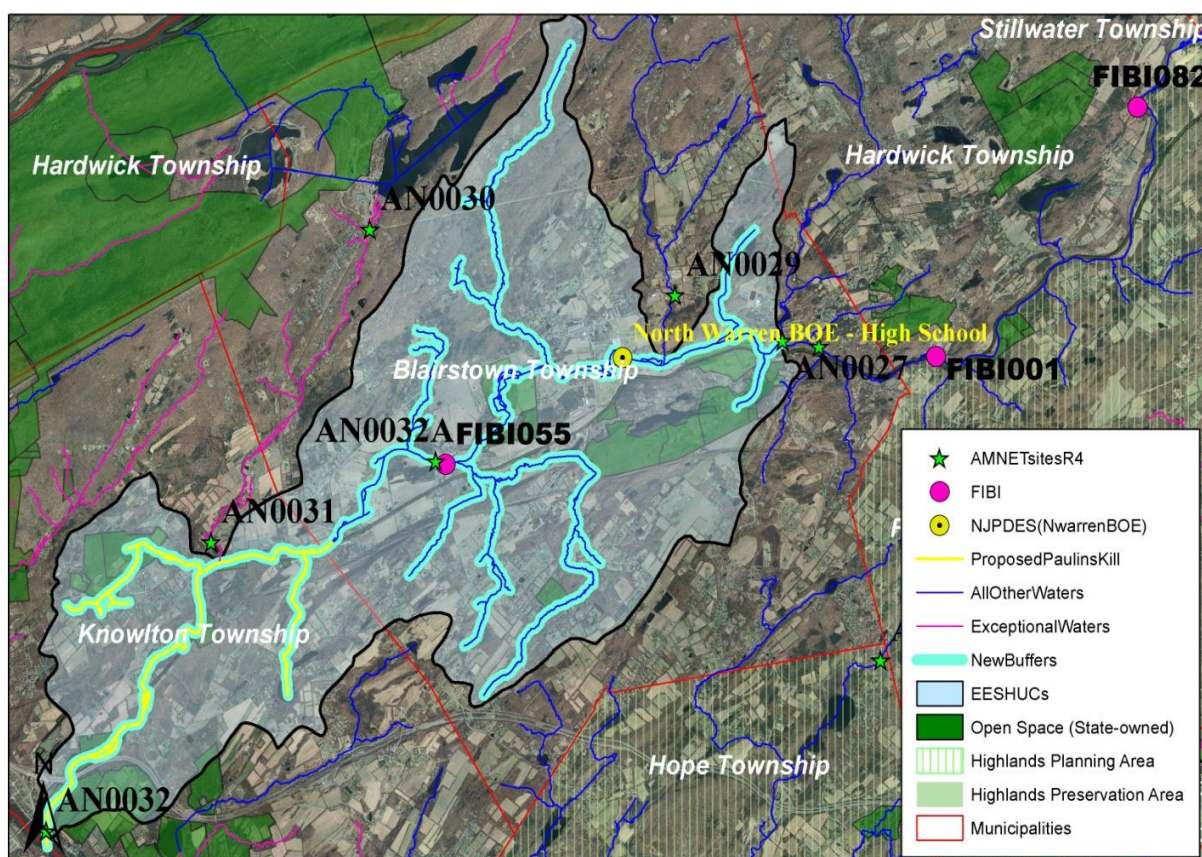


Figure 8



Figure 9

# Paulins Kill



**Proposed Category One Waters Based on Exceptional Ecological Significance**  
(Minimum three required qualifying factors in **bold**)

Stream Name	River miles	AMNET Station	AMNET Rating	Habitat Rating	Water Quality	Fish Index	HUC14 Square miles	HUC14 % Impervious Cover (2007)
Paulins Kill	6.5	AN0032	<b>Excellent</b>	<b>Optimal</b>	<b>Fully Supporting</b>	FIBI055 Good	<b>19</b>	<b>3</b>

**Paulins Kill** – Biology at AN0032A which is within the same HUC did not qualify for C1 upgrade however, the 300 foot buffers implemented by the Storm Water Management program extend to all upstream segments within the HUC. AN0030 and 31 are located on a tributary on an existing C1 stream. AN0027 and 29 are in different HUCs and did not qualify for C1 upgrade. AN0032A is located within the same HUC but did not qualify for C1 upgrade.



# Paulins Kill

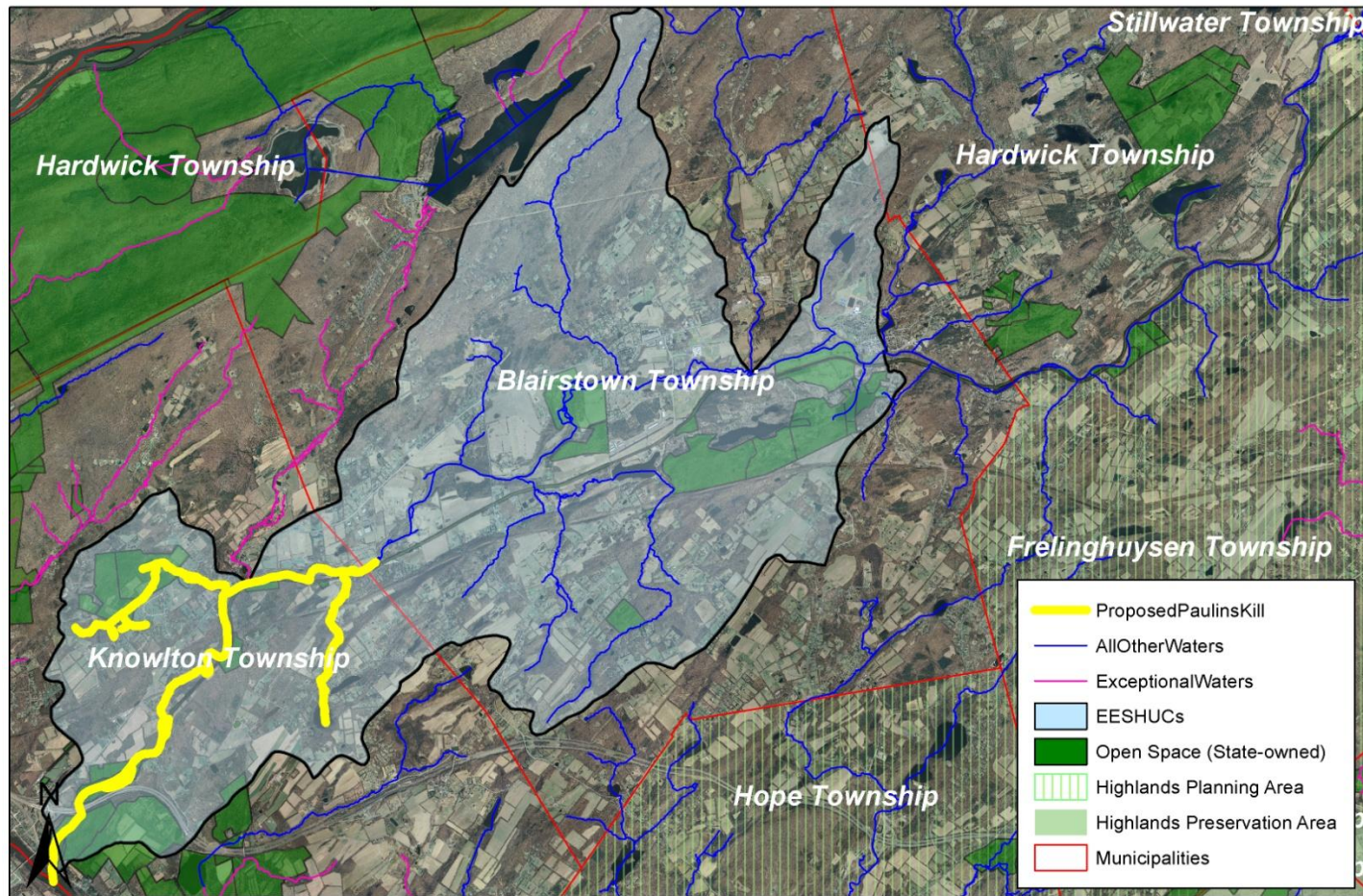
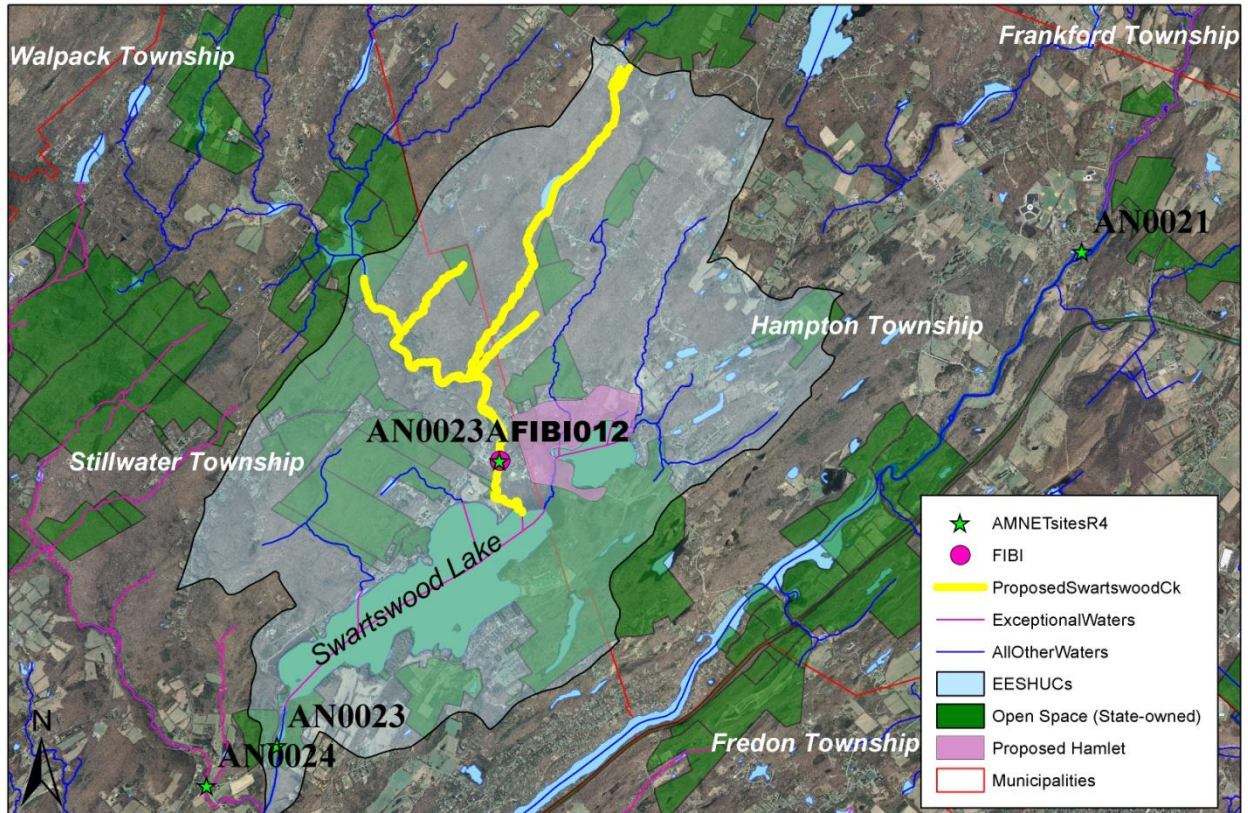


Figure 10



Figure 11

# Swartswood Creek



## Proposed Category One Waters Based on Exceptional Ecological Significance (Minimum three required qualifying factors in **bold**)

Stream Name	River miles	AMNET Station	AMNET Rating	Habitat Rating	Water Quality	Fish Index	HUC14 Square miles	HUC14 % Impervious Cover (2007)
Swartswood Creek	6.5	AN0023A	<b>Good</b>	<b>Optimal</b>	Temperature	FIBI012 Good	<b>9.8</b>	<b>2</b>

**Swartswood Creek** – The recommended stream segment is flowing into Swartswood lake currently designated as C1 therefore, 300 foot buffers are already applicable to these waters. No new buffers are required. AN0023 is located below the lake and did not qualify. AN0024 is located on an existing C1 stream.



# Swartswood Creek

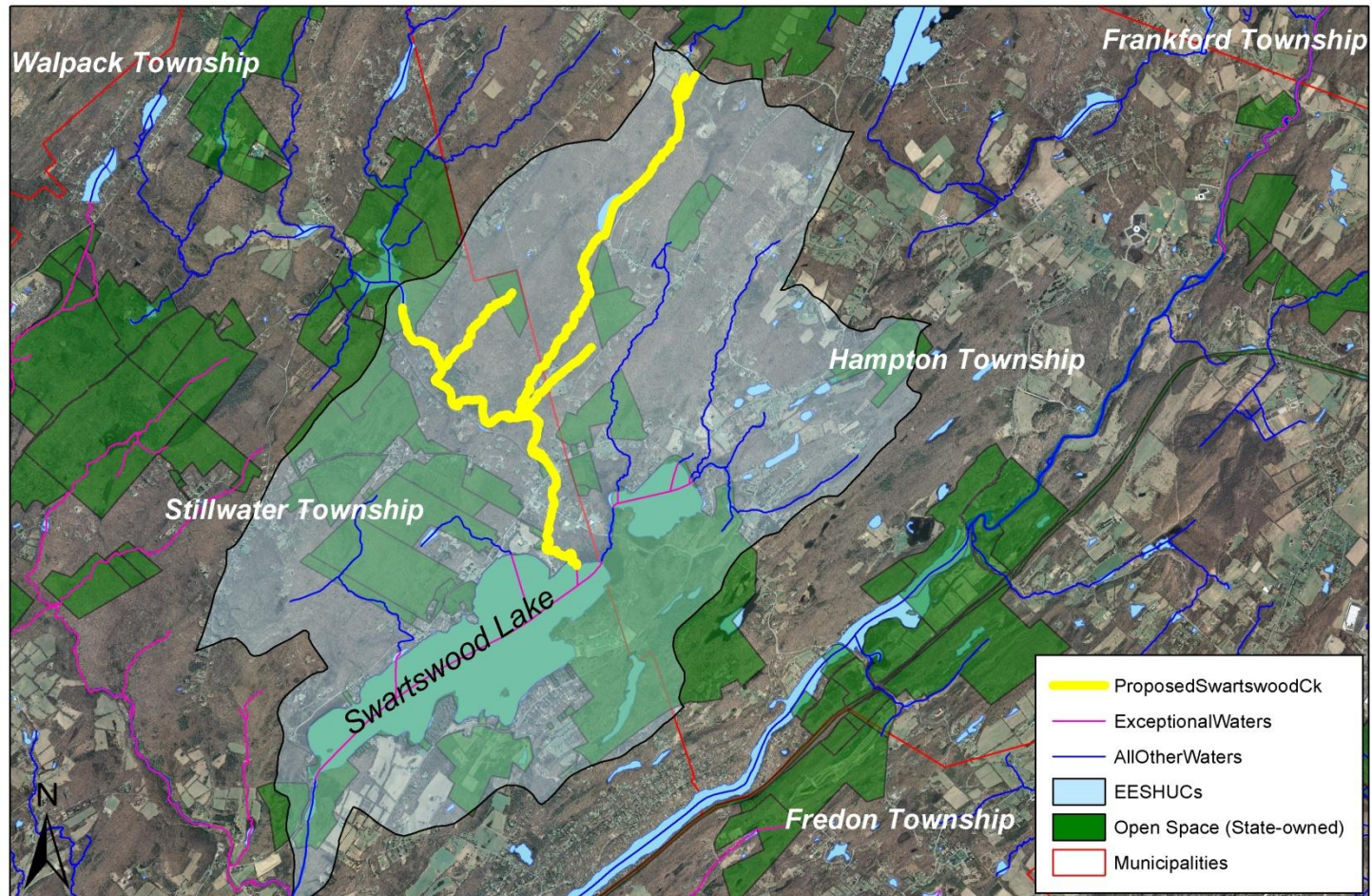


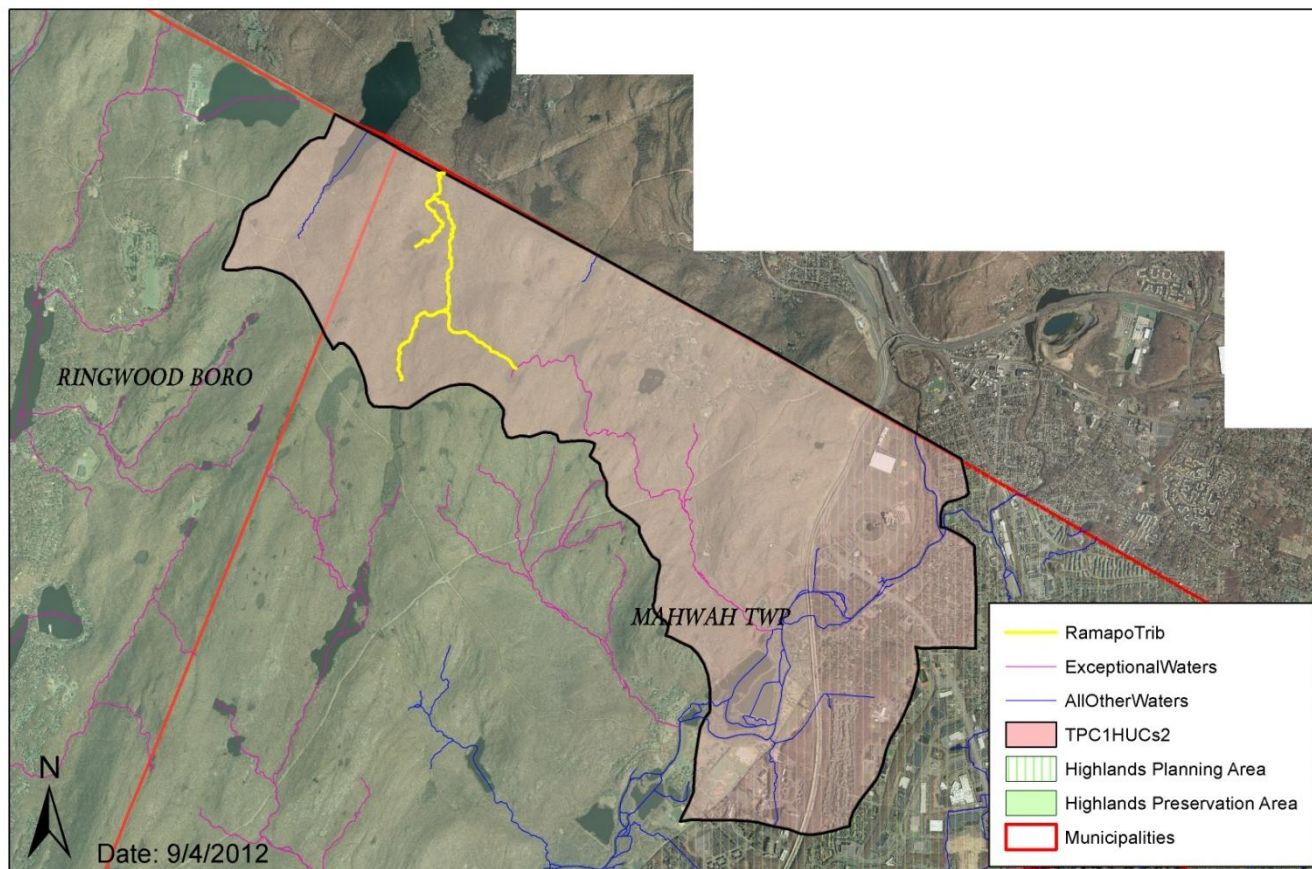
Figure 12



Figure 13

# Ramapo River Tributary

(Trout upgrade)



## Proposed Category One Waters Based on Exceptional Fisheries Resource

(Trout Production)

Stream Segment	Current classification <sup>1</sup>	Proposed classification	Young of the year (trout species)	River miles
Ramapo River tributary (Cranberry Pond) – Source to State line	[FW2-NT]	FW2-TP(C1)	Brook trout	2.6

1. Brackets indicate that the waterbody was not previously identified, although the classification was determined as a default classification.

The recommended tributary of Ramapo River flows into an existing C1 stream, therefore, the 300 foot buffers are already applicable to these waters. No new buffers are required.



# Ramapo River Tributary

(Trout upgrade)

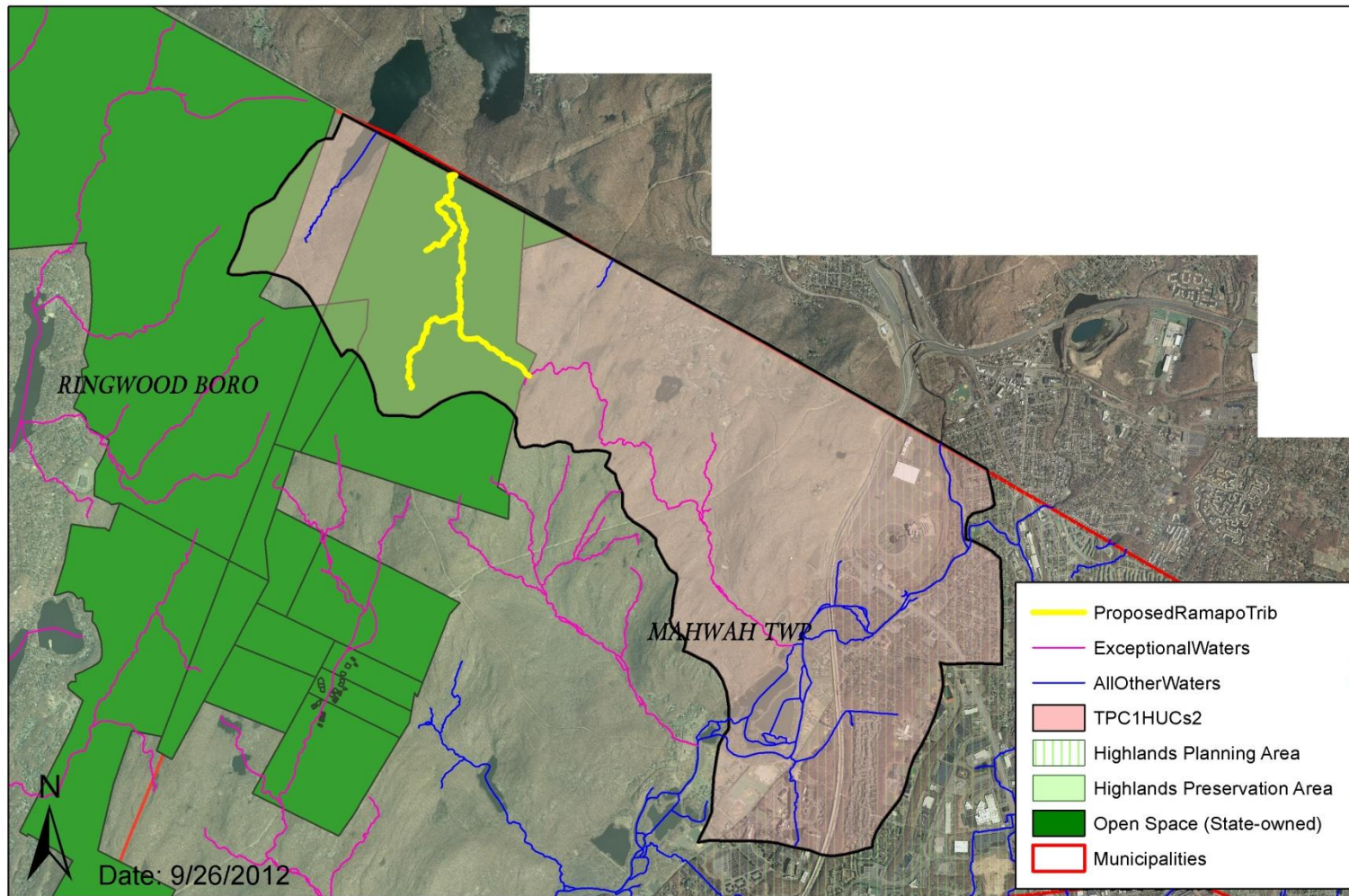
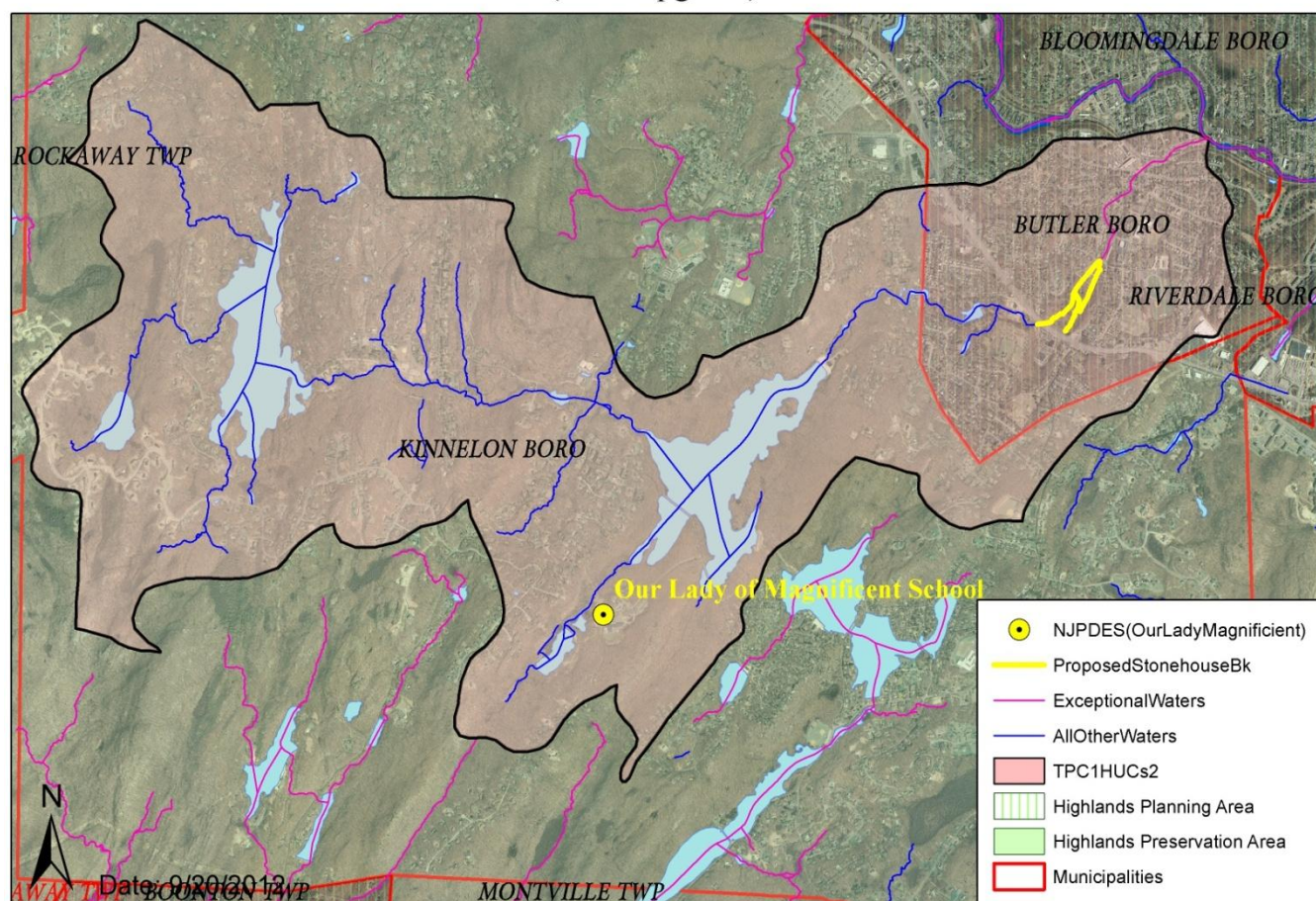


Figure 14

Figure 15

# Stone House Brook

(Trout upgrade)



**Proposed Category One Waters Based on Exceptional Fisheries Resource**  
(Trout Production)

Stream Segment	Current classification	Proposed classification	Young of the year (trout species)	River miles
Stone House Brook (Kinnelon) – Route 23 Bridge to Valley Road Bridge	FW2-NT	FW2-TP(C1)	Brown trout	0.8

The recommended portion of Stone House Brook flows into an existing C1 stream, therefore, the 300 foot buffers are already applicable to all upstream waters. No new buffers are required.



# Stone House Brook

(Trout upgrade)

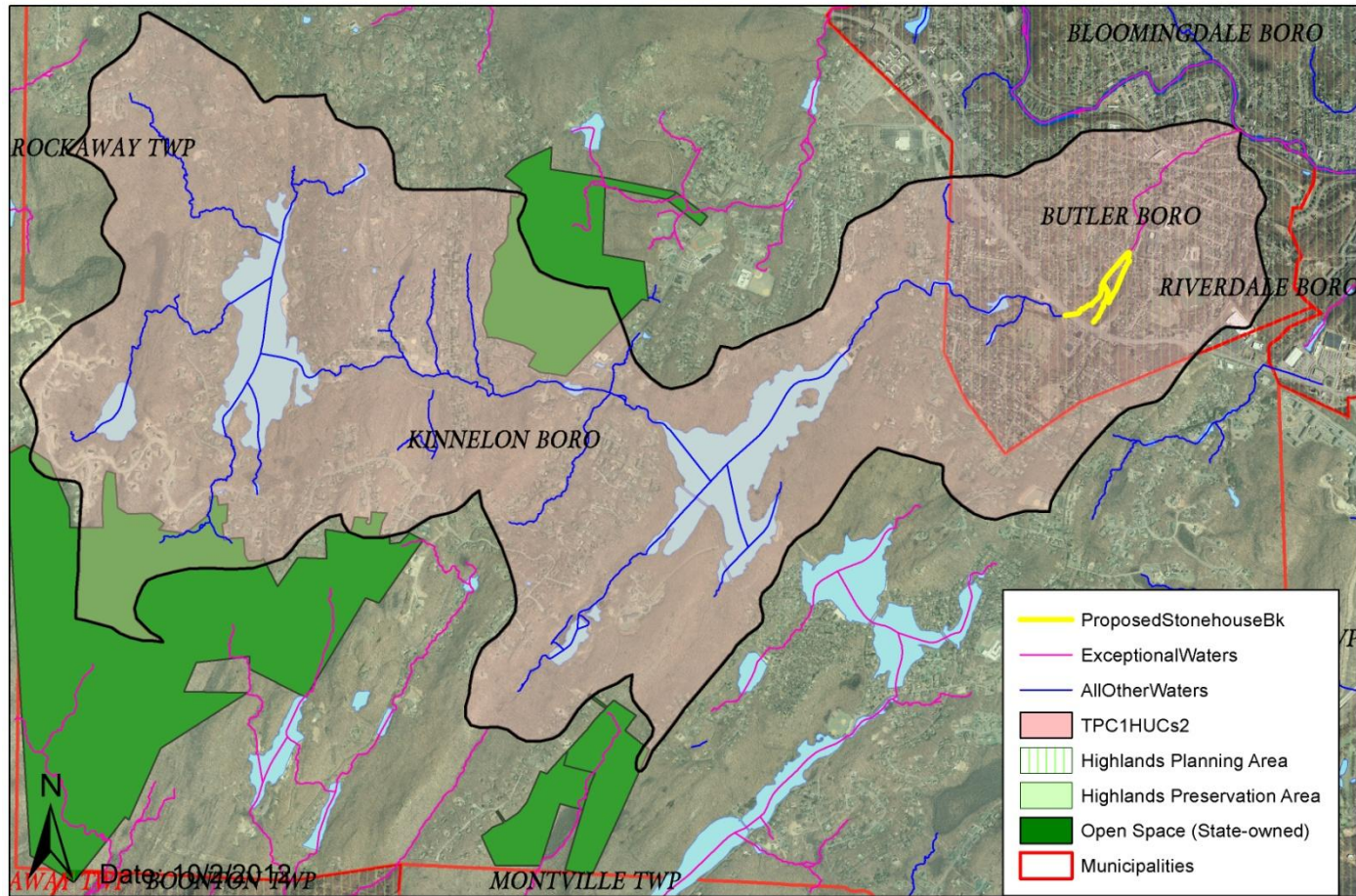
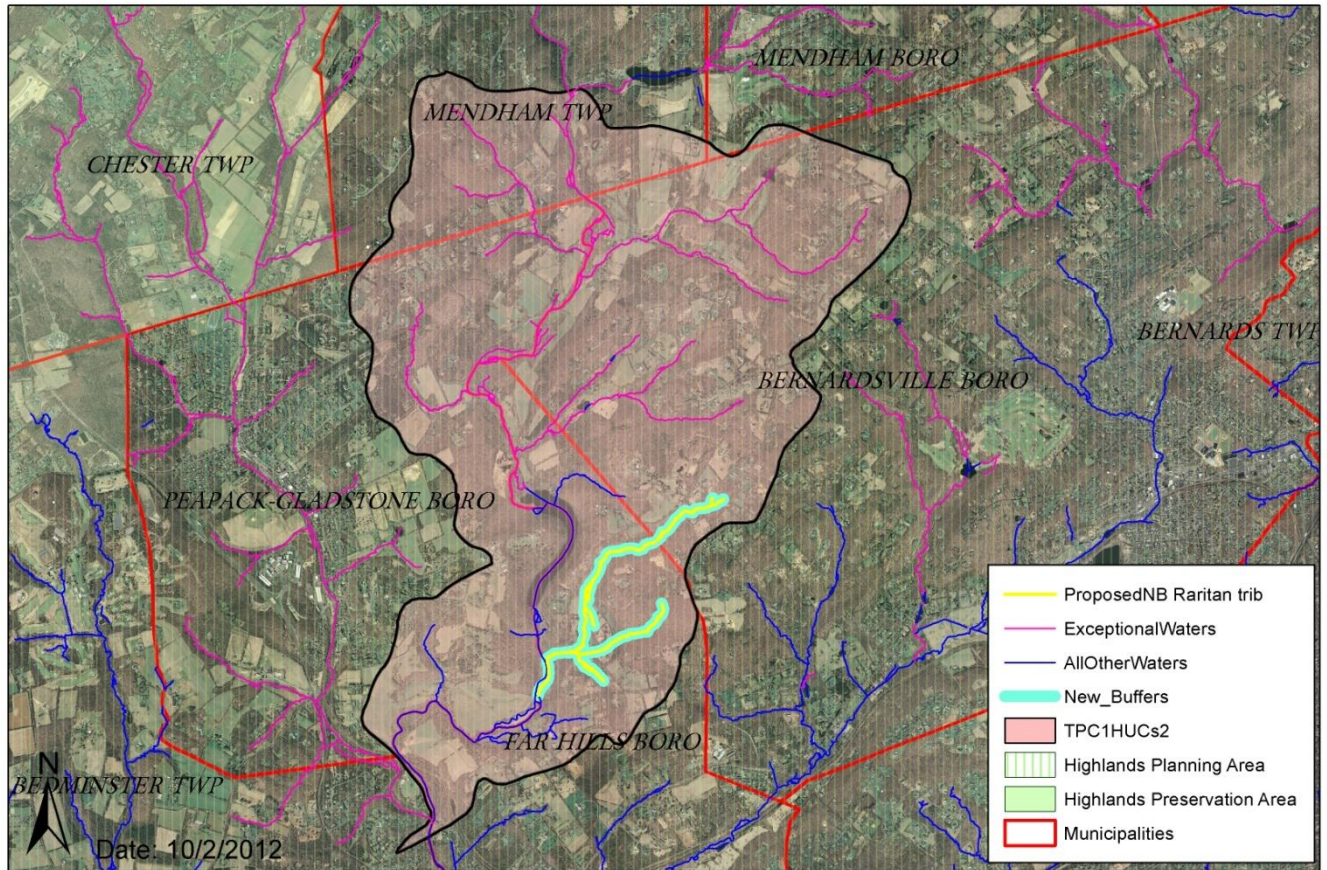


Figure 16



Figure 17

## N. Branch Raritan River Tributary (Trout upgrade)



### Proposed Category One Waters Based on Exceptional Fisheries Resource (Trout Production)

Stream Segment	Current classification <sup>1</sup>	Proposed classification	Young of the year (trout species)	River miles
Raritan River, North Branch, tributary (South of Ravine Lake) – Entire length	[FW2-TM]	FW2-TP(C1)	Brown trout	3.2

1. Brackets indicate that the waterbody was not previously identified, although the classification was determined as a default classification.



# N. Branch Raritan River Tributary

(Trout upgrade)

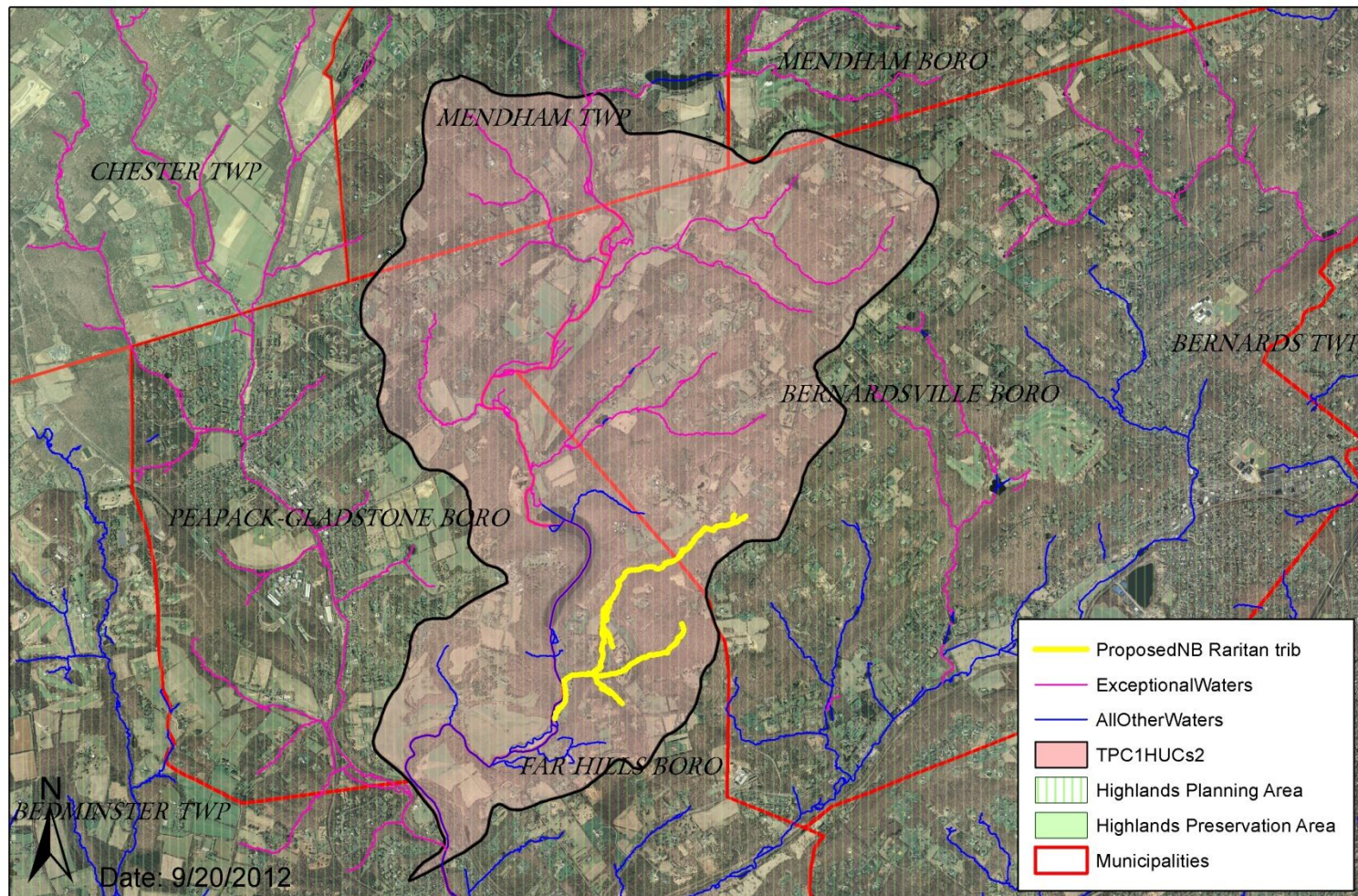
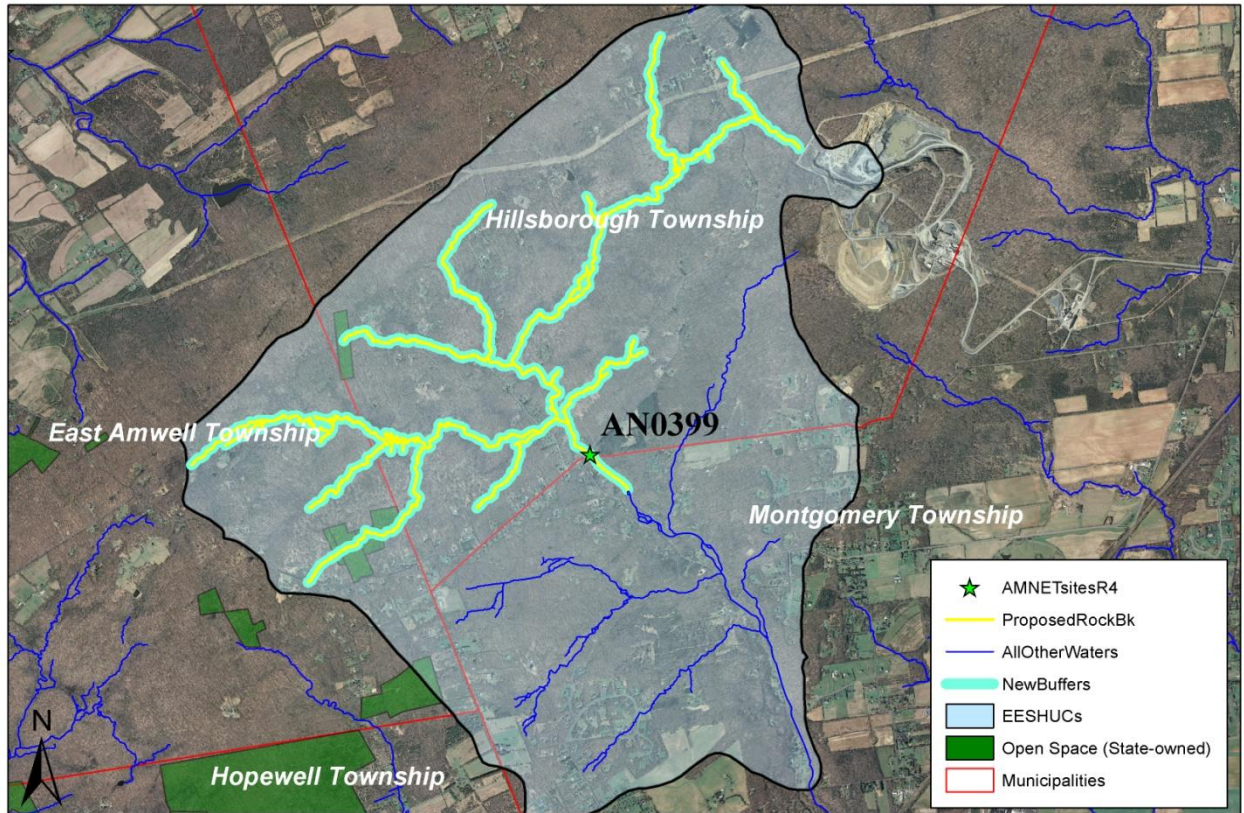


Figure 18



Figure 19

# Rock Brook



**Proposed Category One Waters Based on Exceptional Ecological Significance**  
(Minimum three required qualifying factors in **bold**)

Stream Name	River miles	AMNET Station	AMNET Rating	Habitat Rating	Water Quality	HUC14 Square miles	HUC14 % Impervious Cover (2007)
Rock Brook	12.7	AN0399	<b>Good</b>	<b>Optimal</b>	<b>Fully supporting</b>	<b>6.1</b>	<b>2</b>

# Rock Brook

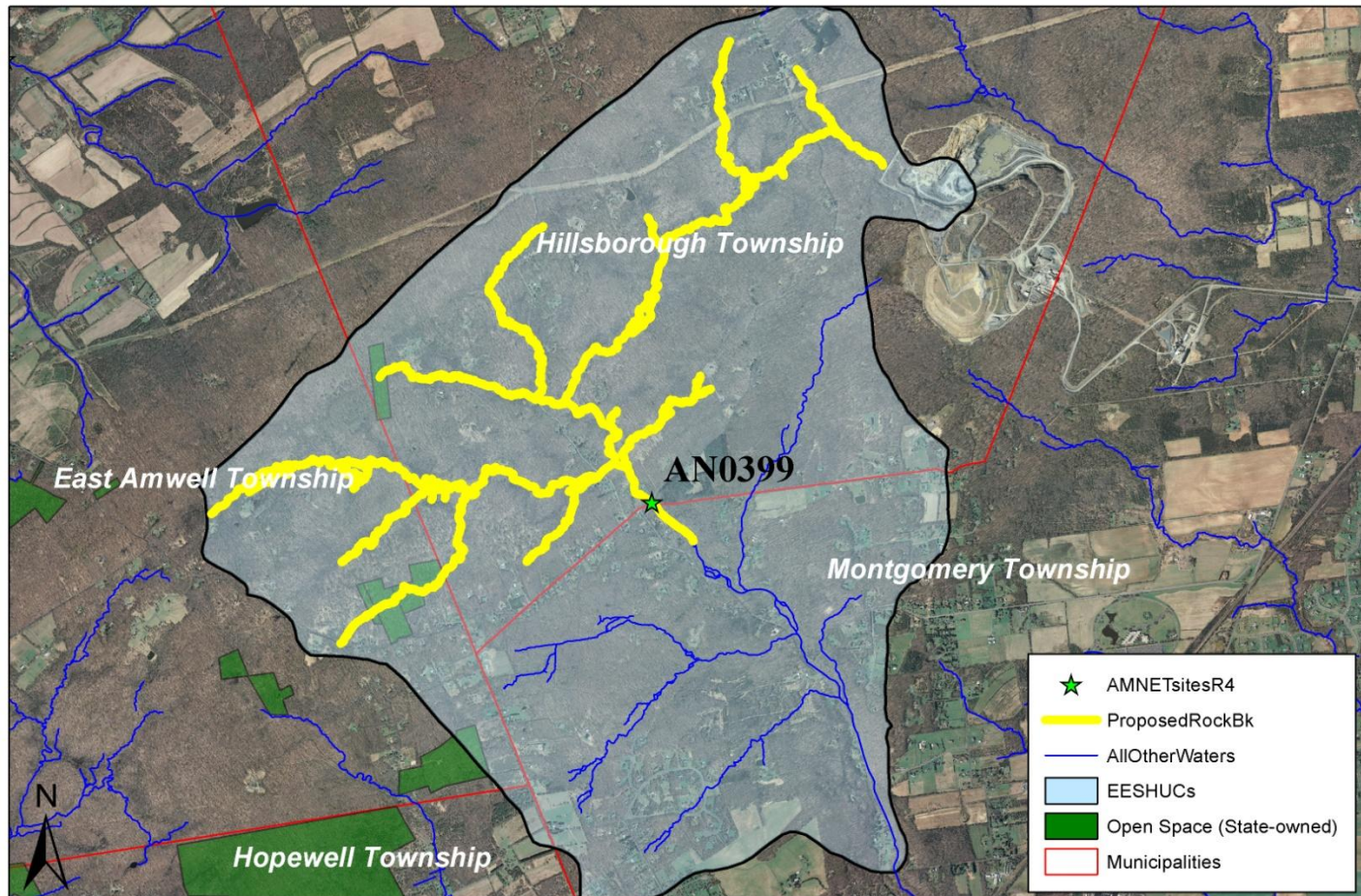
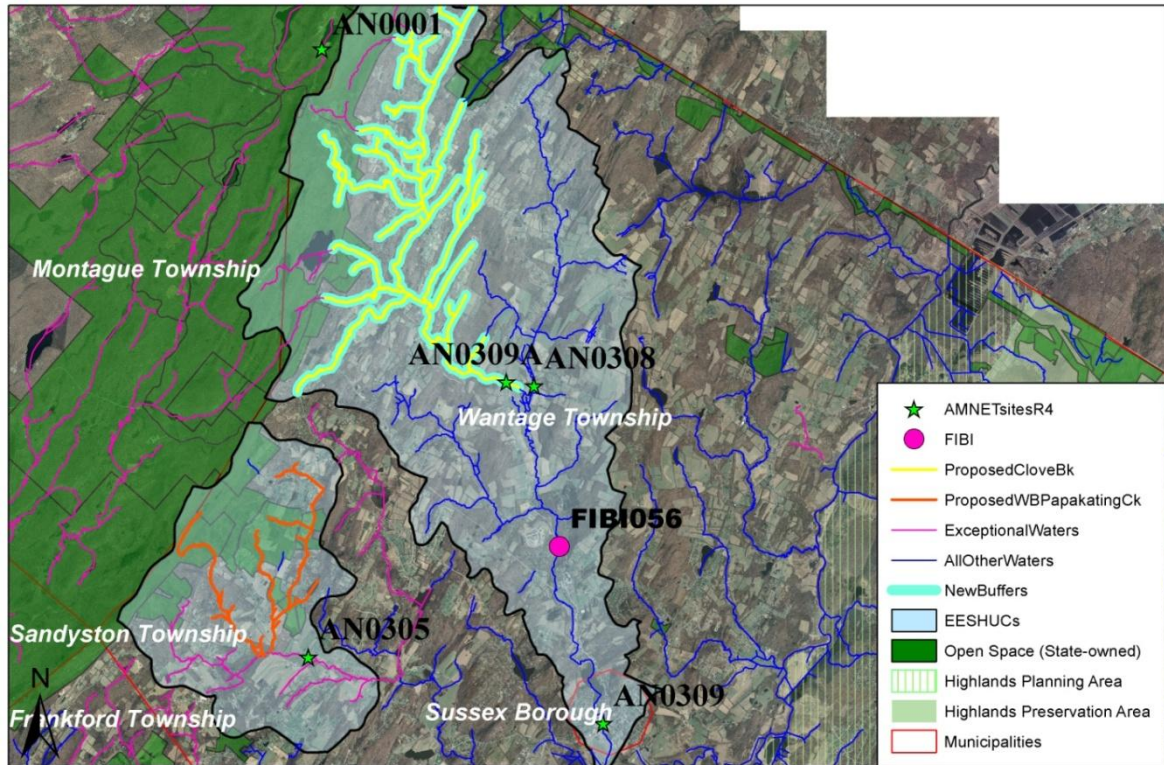


Figure 20



Figure 21

## Clove Brook & W. Br. Papakating Creek



**Proposed Category One Waters Based on Exceptional Ecological Significance**  
(Minimum three required qualifying factors in **bold**)

Stream Name	River miles	AMNET Station	AMNET Rating	Habitat Rating	Water Quality	Fish Index	HUC14 Square miles	HUC14 % Impervious Cover (2007)
Clove Brook	27	AN0309A	<b>Excellent</b>	<b>Optimal</b>	<b>Fully supporting</b>	FIBI056 Good	<b>20</b>	<b>3</b>
W. Branch Papakating Creek	9.1	AN0305	<b>Excellent</b>	<b>Optimal</b>	<b>Fully supporting</b>	N/A	<b>6</b>	<b>2</b>

**Clove Brook** – AN0308 and 309 did not qualify for C1 upgrade which are located within the same HUC.

**West Branch Papakating Creek** - AN0305 is located on an existing C1 stream and the recommended tributaries contribute to the excellent biology recorded at the station. Since the recommended tributaries flow into existing C1 waters, the 300 foot buffers are already applicable to these waters. No new buffers are required.

Recommended stream segments of both Clove Brook and W. Br. Papakating Creek were proposed for C1 upgrade in 2007 based on T&E however, were not adopted after reevaluation.



## Clove Brook & W. Br. Papakating Creek

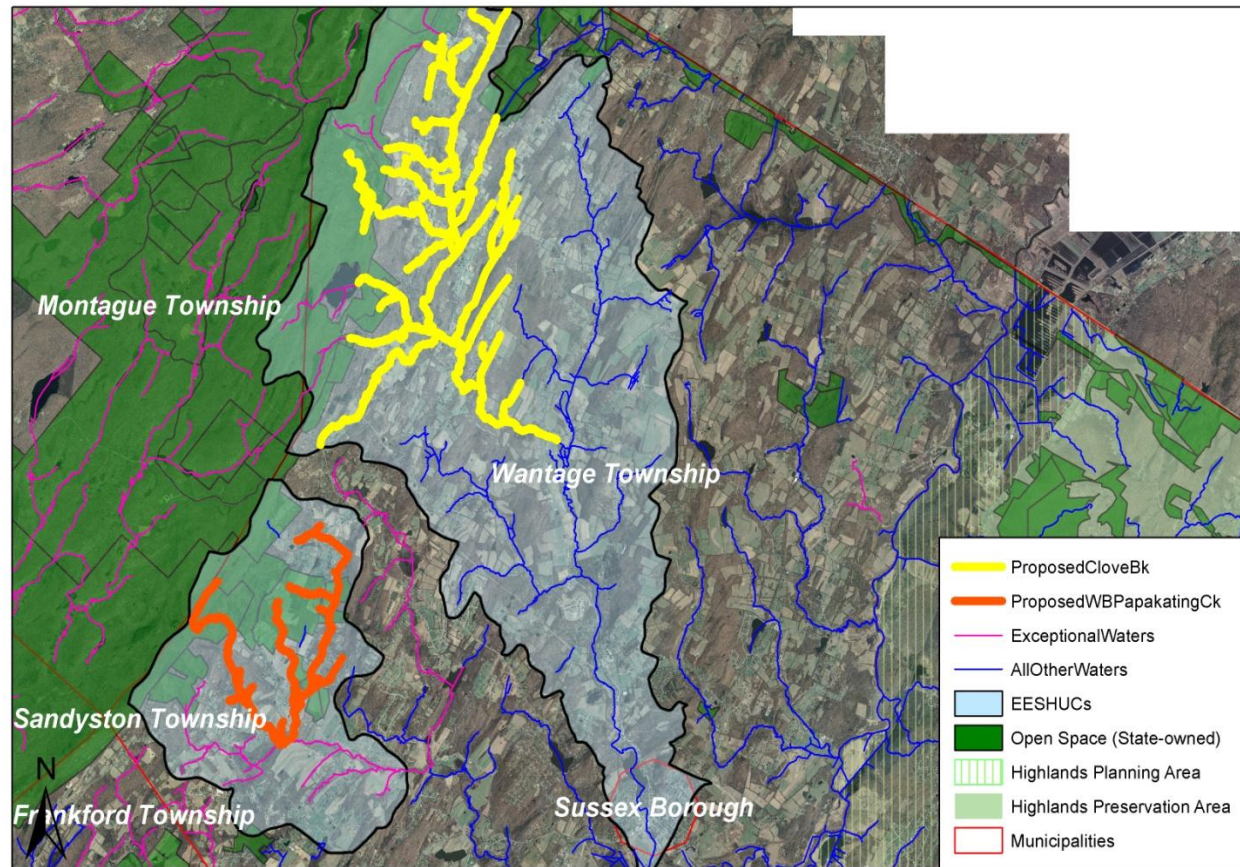


Figure 22

## **E. Conclusions and Findings**

The New Jersey Department of Environmental Protection's water monitoring, surface water quality standards and assessment programs are continuously working to improve the empirical and scientific bases for the designation of surface waters for C1 antidegradation protections. While the Department believes it has made improvements to the process such as creating categories of C1 designations (i.e., exceptional ecological significance, exceptional fisheries resources, exceptional water supply significance and exceptional recreational significance), the Department acknowledges that those categories vary significantly in terms of the strength of their definitions and the quality of available indicators.

This document includes a review of C1 designation process in the Surface Water Quality Standards (SWQS) regulations that the Department began in late 2010, that included stakeholder discussions. Not every approach to evaluate a waterbody lends itself well to the process of evaluating a waterbody for acceptability, under the NJ Surface Water Quality Standards, as a C1 water.

Many of the indicators suggested by stakeholders would not add value to the existing designation process. Overlaps are common between some existing and suggested indicators, and 44 percent of the State's waters are already protected at a C1 level or higher. There are also synergies between the categories and the indicators within the categories. For example, while the exceptional recreational significance category is the least developed, some of the most significant recreational waters in the State, such as the waters of the Atlantic Ocean from Beach Haven Inlet to Cape May Point out to the State's three mile limit, have already been designated as C1 waters.

Through this process the Department has concluded that it should focus on identifying additional indicators that will fill gaps in the existing designation process to support making additional designations in areas not served by the existing indicators and where supporting data exists or can be collected. As new indicators and monitoring methods become available, they should be evaluated for acceptability and if proven to add measurably to the designation process, they should be added into the process.

Follow-up actions include:

- Continue development of the near ocean and estuarine Benthic Indices.
- Continue efforts to improve the methodology for selecting C1 stream segments based on verified occurrences of listed T&E aquatic dependent species.
- Incorporate the use of FIBI methods, for monitoring southern NJ's Inner Coastal Plain rivers and streams, as well as benthic and FIBI methods for headwater streams, into biological monitoring programs.

- Review C1 designations where the geographical boundaries based on open space have been adjusted since the original designations were made. Determine if expanding the designations is justified under the current designation process. Where necessary collect new empirical evidence.
- Provide tools (e.g. ArcView, NJ GeoWeb) to determine if a waterbody has been designated as C1.
- Include information on the basis for a C1 designation in the GIS system when future designations are made.
- Continue on-going efforts to identify waterbody segments that merit C1 designation.

During the external stakeholder meeting several issues were raised that did not deal with the C1 designation process itself, but rather the implementation of antidegradation policies by other programs and rules in the Department. These implementation issues are being addressed as part of ongoing evaluations and stakeholder processes for pertinent programs and rules.

The Department also undertook another look at some C1 adoption decisions that were made in 2008. The Department verified that the most current survey data that was available at the time the 2008 decision was made was utilized. It also reviewed available new survey data collected since 2008. Of the 227 river miles where C1 protections were not adopted in 2008, all decisions were the result of further analysis by the Department resulting from comments received during the public comment period that raised valid issues. It is important to note that the changes made upon adoption in 2008 affected only 4 of the 20 waterbodies. While some of the changes were the result of relatively straight forward issues, such as verifying the information available to the Department, others were the result of very substantial reevaluations. As discussed in Section C, these included the Department's decision that it was necessary to resurvey the Stony Brook between proposal and adoption, and refinements made to the process for designations based on Bog Turtle habitat that impacted both the Wallkill and the Pequest Rivers. Overall, this review has found that the decisions made in the 2008 to only adopt C1 protections for 682.5 of the 909.5 river miles were consistent with the definition of "Category one waters" and paragraph one of the definition of "Exceptional ecological significance" at N.J.A.C. 7:9B-1.4. No additional C1 designations, based on endangered and threatened species, are warranted for any of 227 river miles where C1 protections were not adopted in 2008.

Finally, a total 121 river miles have been identified as recommended candidate waters to receive C1 protections based on the Exceptional Ecological Significance or the Exceptional Fisheries Resources categories. This includes 36 river miles that were among the 227 river miles where C1 protections were not adopted in 2008 based on endangered and threatened species. Candidate waters will need to go through the formal rulemaking process to receive C1 designation.