Wells River Watershed

August 2014

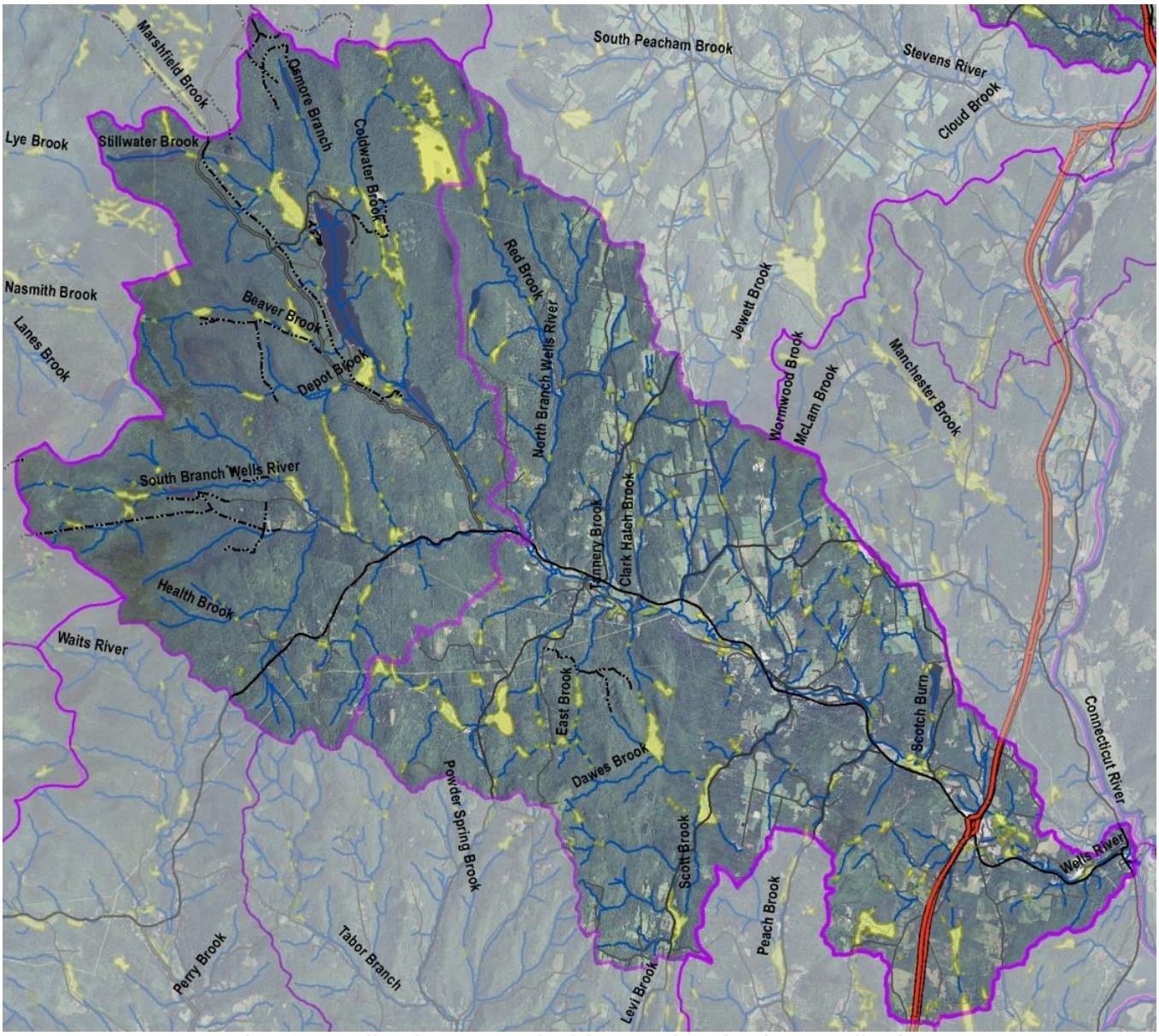

Figure 1. Wells River Watershed (mapped wetlands are yellow)

Table of Contents

Wells River Watershed 1
- Earlier Information on the Wells River Watershed 1
- General Description of the Wells River Watershed 1
- Special Values and Features in the Wells River watershed 1
  - Very High Quality Waters 1
  - Peacham Bog Natural Area 1
  - Biodiversity 2
- Wells River Watershed Summary of Segments with Impacts 3
- Assessment Information for the Wells River 3
  - Biological Monitoring in the Wells River Watershed 3
  - Fisheries Status 4
  - Physical Stream Assessment 5
  - Landfill Site Assessments 6
- Sources of Information 9

Earlier Information on the Wells River Watershed

The last time that a formal assessment report was done on the Wells River was in 1999 as the Basin 14 – Stevens, Wells, Waits, Ompompanoosuc Water Quality and Aquatic Habitat Assessment Report. Following that there was the Basin 14 "Little Rivers" Water Quality Management Plan dated June 2008. Updated information was used in the formation of that plan. A river corridor plan dated May 27, 2009 was done for the Wells River by Redstart Forestry and Consulting. The corridor plan integrated the Phase 1 assessment and the limited Phase 2 assessment and came up with a list of potential projects as well as a summary of their analysis of the river's physical condition. This 2013 water quality and aquatic habitat update attempts to summarize the latest assessment information and data in preparation for a tactical basin plan for Basin 14.

General Description of the Wells River Watershed

The Wells River watershed is about 64,202 acres or 100.3 square miles in size (using the ANR Natural Resources Atlas watershed delineation tool). The Wells River itself begins below Lake Groton and Ricker Pond and flows southeasterly through Groton, South Ryegate and the northern portion of Newbury before meeting the Connecticut River in the village of Wells River.

Red Brook and the North Branch Wells River are formed from drainage from the slopes of Devils Hill, Jennison Mountain, Jerry Lund Mountain and Wesson Hill . These are two of the three largest tributaries to the Wells. The South Branch Wells River is the third significant tributary and it arises in Noyes Pond, flows for approximately 7 miles, and then joins the Wells River mainstem between West Groton and Groton.

There are seven large lakes and ponds in the Wells River watershed including Lake Groton (422 acres), Kettle Pond (109 acres), Ricker Pond (95 acres), Ticklenaked Pond (54 acres), Osmore Pond (48 acres), and Noyes Pond (39 acres).

Special Values and Features in the Wells River watershed

Very High Quality Waters

Very high quality waters in the Wells River watershed as determined by Fish and Wildlife Department sampling include Beaver Brook, Coldwater Brook, Depot Brook, Hosmer Brook, and the South Branch of the Wells River. Brook trout were the only salmonids found in these streams when they were last sampled.

Peacham Bog Natural Area

This natural area is 748 acres in Groton State Forest in town of Peacham. Peacham Bog is the second largest peatland in Vermont, one of the two documented "raised" (slightly domed due to peat build-up at the center) bogs in the state. The Natural Area includes the bog of 125 acres and an extensive buffer of a variety of wetlands and upland softwoods. Many wildlife species, including moose, bobcat, and fisher, use the area. Peacham Bog itself is a potential Class 1 candidate wetland.

Biodiversity

The headwaters area of the Wells River watershed is mapped as making the “greatest”, Tier 1, or “very high”, Tier 2, contribution to biodiversity. There are additional scattered areas of this very high biodiversity.

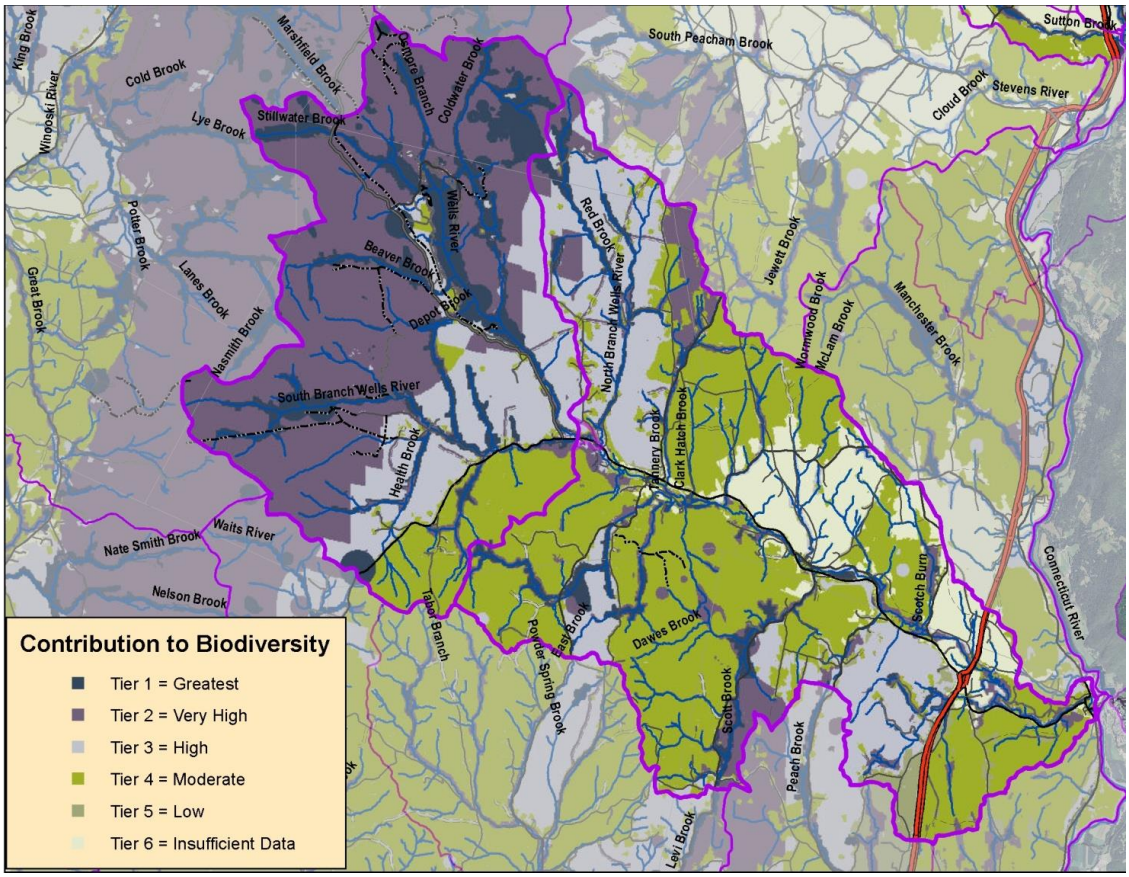

Figure 2. Degrees of known biodiversity in the Wells River watershed.

The purple/deep blue that indicates the very high and greatest contribution to biodiversity is an area that contains a number of rare species locations, a number of uncommon species locations, Peacham Bog (a rare natural community), a lot of area mapped as uncommon natural community, some vernal pools, four areas mapped as mast stands, and surface waters with good riparian areas. This upper part of the watershed is also part of a very large habitat block and a portion of it is considered rare physical landscape. It is an “anchor block” in terms of connectivity.

Wells River Watershed Summary of Segments with Impacts

Stream or Lake Segment	Milage & Status	Pollutant	Source	Other information
Levi Pond (Groton)	***Impaired-*** Part D list	acid	acid deposition	EPA approved the TMDL on September 20, 2004
Ticklenaked Pond (Ryegate)	***Impaired-*** Part D list	phosphorus	Ag runoff in the past	Algae blooms, low D.O. EPA approved the TMDL November 30,2009.
Wells River – below Boltonville dam	0.4 miles ***Altered –*** Part F list	Poor flow, physical alter-ations in bypass section	Boltonville hydro facility	FERC Exemption
Wells River – downstream of Newbury Landfill	0.5 miles ***Stressed-*** Part C list	iron	Newbury Landfill (closed)	Landfill leachate enters the river via ground-water – aesthetics stressed

Assessment Information for the Wells River

Biological Monitoring in the Wells River Watershed

There has been very little biological monitoring in the Wells River watershed and what biomonitoring results there are available are already getting old. Following is Table 1 with the biomonitoring done in the last ten years. Table 2 has locations where it would be important to have biological monitoring results.

Table 1. Macroinvertebrate sampling results for Wells River

Stream	Rivermile	Community	Result	Year
Wells River	Rm 10.5	macroinvertebrates	excellent	2007
Scotch Burn	Rm 0.5	macroinvertebrates	exc-vgood	2007
Scotch Burn	Rm 0.5	fish	poor	2007
South Branch Wells River	Rm 2.5	macroinvertebrates	vg-good	2013

Table 2. Biomonitoring needed in the Wells River watershed

Stream or river name	Location/number of sites	Comment
Wells River	Two – stations 4.4 and 10.5	Update current sites
North Branch Wells River	A site or two.	Have no bio data
Red Brook	A site.	Have no bio data
Beaver Brook	A site	Have no bio data
Osmore Brook	A site	Have no bio data
Coldwater Brook	A site	Have no bio data
Tannery Brook	A site	Have no bio data

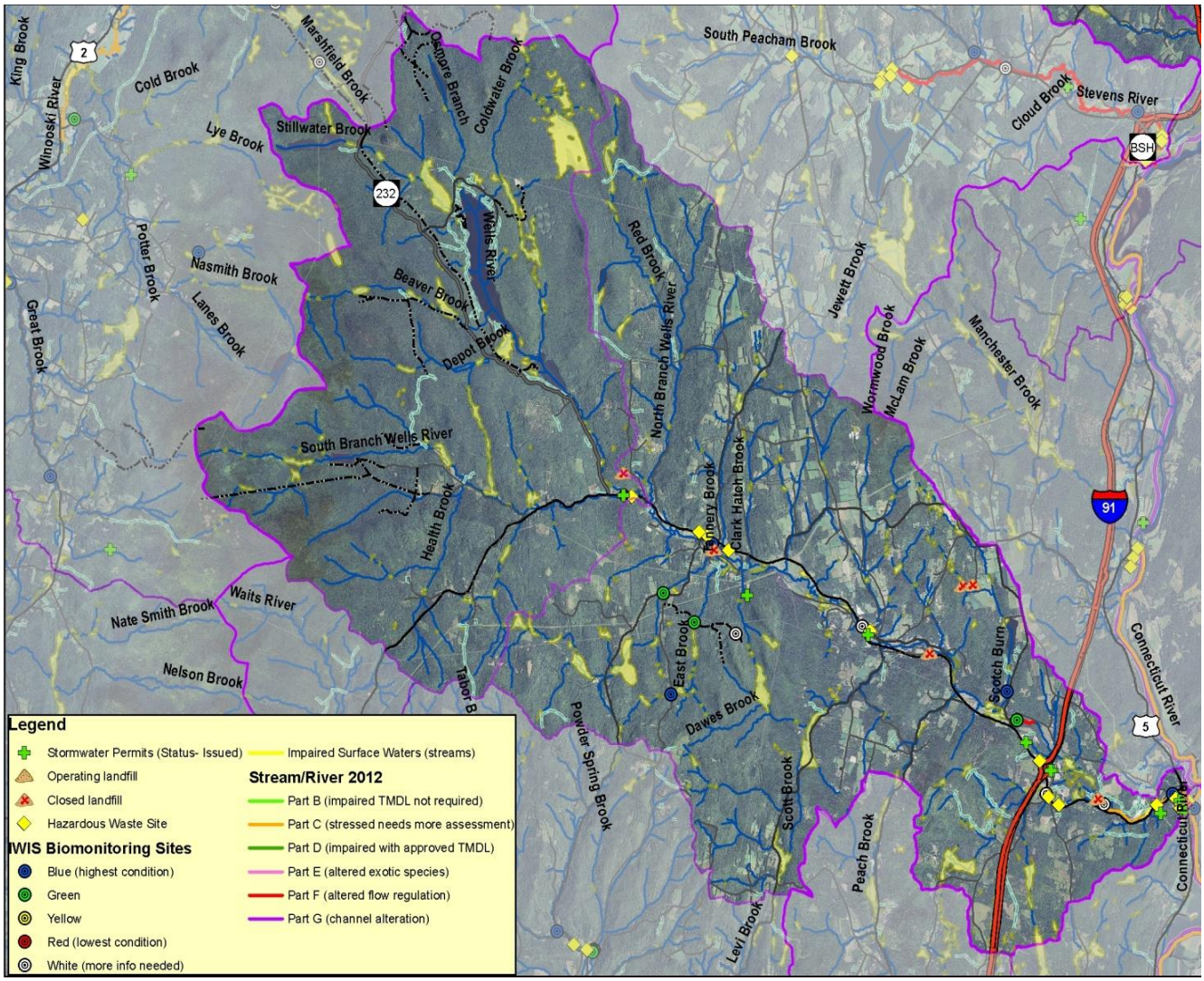

Figure 3. Wells River Assessment Information

Fisheries Status

The Wells River watershed provides a diversity of fishing opportunities ranging from warmwater fish species in some of the large lakes including Lake Groton, and Ricker and Ticklenaked ponds, to self sustaining brook trout fisheries in Noyes Pond and many headwater streams. As noted in the Draft Groton Management Unit Long Range Management Plan, Noyes Pond is a remarkable fishery resource not only within the Wells River watershed, but within the entire State of Vermont. Sizable ponds in Vermont that support, or have the capacity to support, an entirely wild population of brook trout that sustains a high quality fishery are a rarity. Densities of wild brook trout in Noyes Pond compare favorably with the best brook trout ponds in Maine. Noyes Pond is a *limited-entry* fishery. Angling is prohibited in the tributaries to Noyes Pond, for the purpose of maintaining them as a spawning and nursery refuge (ANR 2007).

Other lakes in the watershed and the Wells River are stocked with trout species. Levi and Osmore ponds are stocked with brook trout while Kettle Pond is stocked with rainbow trout.

Within the last decade, anglers have illegally introduced largemouth bass to Levi Pond, and a population has become established. The presence of bass in this pond has eliminated any opportunity to manage this pond as a wild brook trout fishery.

Lake Groton, and Ricker and Ticklenaked ponds are regularly fished for warm water species including smallmouth bass, largemouth bass, chain pickerel, yellow perch, brown bullhead, and sunfish. Excessive nutrient levels in Ticklenaked Pond have caused dissolved oxygen levels that are too low to support fish life in the depths.

Streams in the Groton State Forest and many of the other upland streams in the Wells River watershed including Keenan and Tannery Brooks, provide wild self-sustaining populations of brook trout at an abundance level and growth rate high enough to attract angling interest.

The Wells River is stocked by the Vermont Department of Fish and Wildlife with brook trout from the confluence of the North and South Branches downstream to to South Ryegate Village. Rainbow trout are stocked from South Ryegate Village down nearly to the confluence with the Connecticut River. The Wells River starts out warm because it flows from Ricker Pond, but tributaries like the South Branch of the Wells River help to cool it as it flows further downstream. The majority of the Wells River is too warm for trout during the summer months, but trout can survive in cold water refugia in the Wells River and its tributaries. The Wells River had been stocked with Atlantic salmon fry as part of an effort to restore Atlantic salmon to the Connecticut River. The Wells River was last stocked with salmon in the spring of 2011. Returning adult salmon currently can ascend as far up the Connecticut River as the dam at Dodge Falls in East Ryegate, about 4 miles upstream of the mouths of the Wells and Ammonusooc rivers. Salmon are not able to ascend into to the upper Wells River because of the dams close to its confluence with the Connecticut River.

Fish species collected at the former Wells River salmon monitoring stationfrom 2006 to 2011 include: Atlantic salmon, brook trout, brown trout, largemouth bass, yellow perch, slimy sculpin, common shiner, longnose dace, blacknose dace, lake chub, white sucker, creek chub, and tessellated darter. There should be no juvenile Atlantic salmon remaining in the river after the spring of 2014.

Streams that are considered “very high quality waters for recreational fishing”, which are defined by having abundant wild trout populations with multiple age classes (abundant being 1000 fish per mile or 20 pounds per acre or more), in the Wells River watershed include Beaver Brook, Coldwater Brook, Depot Brook, Hosmer Brook, and the South Branch of the Wells River.

Physical Stream Assessment

Redstart Consulting for the Caledonia County NRCD did a Phase 1 and limited Phase 2 assessment of the Wells River. The Phase 2 assessment focused on the mainstem of the Wells River in the town of Newbury where eight mainstem segments and one tributary segment were evaluated. The report titled *Wells River Watershed River Corridor Management Plan – Orange and Caledonia Counties, Vermont* dated May 27, 2009 and done by Redstart Consulting found the following (among other study results):

- Many of the stream reaches have lost access to historical floodplains largely due to channelization and straightening;
- Sections of the river are confined by roads and development – primarily the lower four sections (M01 through M04);
- The Phase 2 study found channel widths less than what would be expected for reference conditions and it is summized that the hydrology of the watershed may be "somewhat unique" with wetlands and hydric soils influencing the narrower- than-expected channel widths;
- Major flooding in the village of Wells River occurred in 1927, 1973, 1984, 1997;
- There are two active dams (in M02 & M08) and two old mill sites (in M02 & M04) in the Phase 2 project area;
- Four of the reaches (M01, M02, M04, M05) have "severe" to "very high" erodibility ratings;
- Primary stressors are variable from readh to reach with straightening in 9 of 14 segments; encroachment in only 4 of the 14 segments, a headcut in only one segment;
- No physical evidence of dredging or gravel mining was found in the study segments although the authors think that M01 along Wells River village likely was dredged following the floods.

Landfill Site Assessments

Newbury Landfill

The Newbury landfill was closed and capped the first in the mid 1990s, however despite the closure, the landfill continued to discharge contaminated leachate into waters of the state. In 2000, the Vermont DEC Solid Waste Program asked for an approach to stopping the discharge and getting no response then asked for a synthetic cap for the landfill. The owners came up with a draft closure plan that included the synthetic cap and this draft closure plan, as well as a following draft post-closure plan, were approved by ANR. An Assurance of Discontinuance (AOD) documenting the agreement to implement the two plans and documenting the specific water quality monitoring that needed to occur for at least 20 years was entered as an order of the court in January 2002.

Groundwater and surface water monitoring has been happening since 1999 with bi-annual samples taken in May and October each year since 2001 until the present (2014). As of May 2014, there were three monitoring wells for upgradient groundwater monitoring, five on-property downgradient groundwater monitoring wells, and three off-property groundwater monitoring wells (Kaplan, Allen-1, Allen-2), all of which are closer to the Wells river than the rest of the wells. There are also two Wells River surface water sites – one "upstream" and one "downstream" although the upstream site appears as if it could still be influenced by groundwater from the landfill.

The various caps at this landfill have not eliminated the contamination that has been measured in some of the monitoring wells. In the May 2014 sampling round, dissolved manganese was above the Vermont Groundwater Enforcement Standards (VGES) in 10 of the 11 monitoring wells and dissolved iron above the VGES was in 8 of the 11 wells. Some organic compounds are also still being detected in 2014.

The Kaplan well, Allen Seep 1 and 2 wells, and the two surface water sample results are those that would indicate threats, stresses, or impacts to the Wells River and its aquatic biota most clearly. The Kaplan well (near the bank of the river) has had: arsenic above the Vermont Preventative Action Level (PAL); dissolved iron and manganese above the VGES; and detection of chlorobenzene, diethyl ether, and 1,4-dichlorobenzene in recent years (but not detected since the October 2012 sampling).

Allen Seep 1 has had: dissolved arsenic above the PAL and the VGES; dissolved iron and manganese above the VGES; dissolved nickel above the PAL or VGES a number of times before 2009; dissolved lead above the PAL once and the VGES once; detections of 1,1-dichloroethane from 2003 to 2009; detections of diethyl ether three times and one detection of acetone in 2008..

Allen Seep 2 has had dissolved manganese above the VGES; a few incidents of dissolved iron above the PAL or VGES; and one sample with dissolved lead above the PAL. Organic pollutants have not been detected in Allen Seep 2 sicne one detect of 1,1-dichloro-ethande in 2000.

The surface water samples have not shown organics as a problem and inorganics have not been above water quality standards.

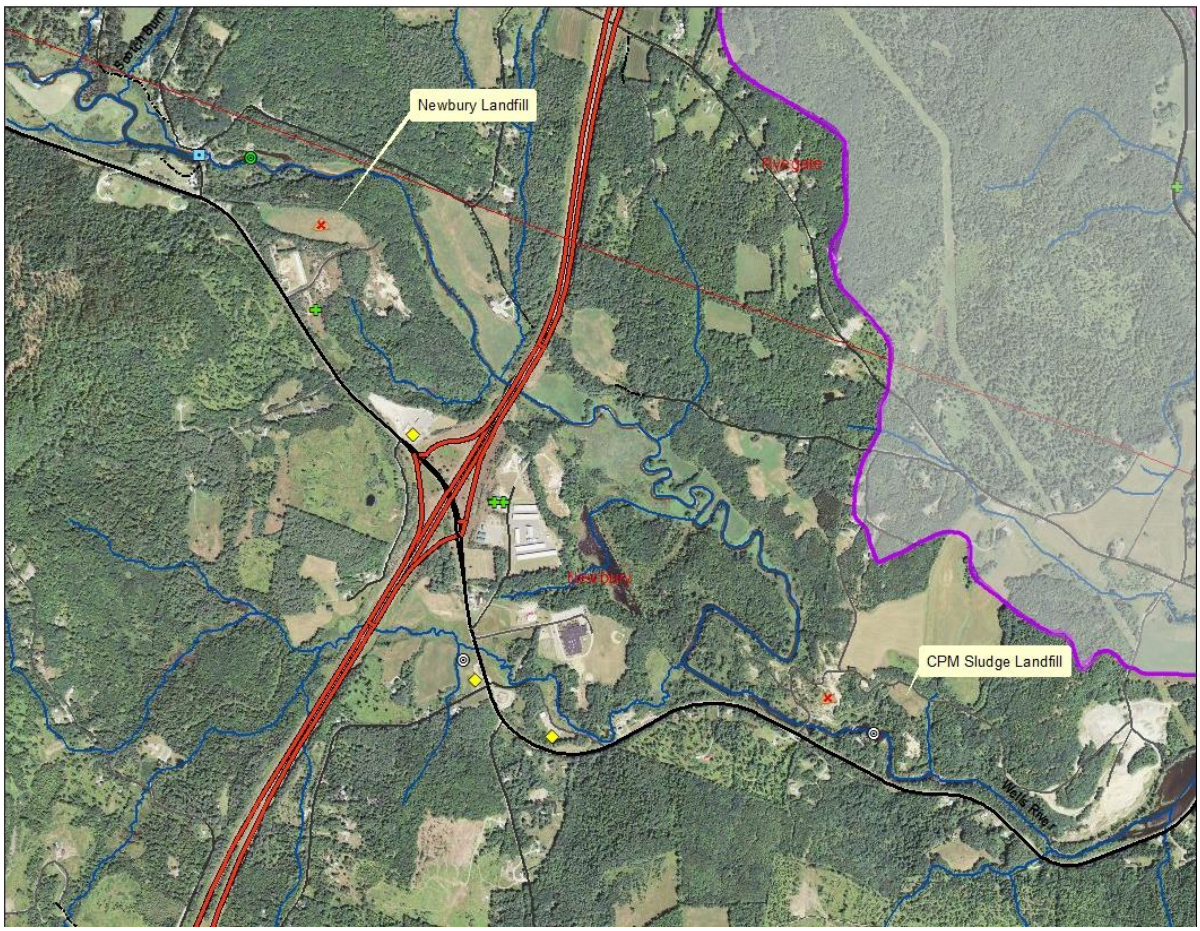

Figure 4. Locations of the Newbury and CPM Sludge Landfills along Wells River

CPM Paper Sludge Landfill

The landfill was privately owned and operated but took only paper sludge from the CPM paper company (at least when the Solid Waste Program certified it – not sure about historical use). At some point, CPM Paper was sold to Kimberly Clarke and then they stopped operating the nearby paper mill. Sometime around 2005, Longmoore (the owner of the landfill) sold a very large parcel of land, including the landfill to Chief Construction Company. Chief Construction sought an Act 250 permit sometime in 2006 to operate an adjacent sand and gravel pit. At the time, DEC Solid Waste Program spoke about the landfill and associated contamination with the Chief Construction.

The Solid Waste Program started to do some monitoring at the site but hasn't done much more than that. At one point, the Program did communicate with Kimberly Clarke to see if they would provide more money to address some of the issues at this site but Kimberly Clark refused to participate. There are some funds in escrow. In August 2014, DEC staff visited the site and found the seeps that had once been monitored and took two samples for metals analysis. Next steps are to be determined.

Figure 5. Seep at CPM Sludge Landfill

Sources of Information

1. ANR Department of Environmental Conservation, Biomonitoring Section, Steve Fiske and Rich Langdon – data and assessment on aquatic communities in Stevens, Wells, Waits, and Ompompanoosuc watersheds.

2. ANR Department of Fish and Wildlife, Jud Kratzer, fishery biologist in the St. Johnsbury District Office, fishery status of the Wells River watershed. September 2013.

3. ANR Department of Fish and Wildlife BioFinder mapping tool.

4. *May 2014 Water Quality Sampling and Analysis of Trends and Standards Exceedances, Newbury Waste Management Inc Landfill (closed),* July 2014. Prepared by Waite-Heindel Environmental Management. (Earlier editions of these annual reports were used as well.)

5. *Wells River Watershed River Corridor Management Plan – Orange and Caledonia Counties, Vermont*, May 27, 2009. Redstart Consulting for the Caledonia County Natural Resources Conservation District.