

Increasing protections for certain Vermont lakes via reclassification under Vermont's Water Quality Standards

Oliver Pierson, VTDEC Lakes and Ponds Management and Protection Program, April 2021

The [Vermont Water Quality Standards](#) (VWQS) is a document pursuant to the US Clean Water Act that lays out standards to protect water quality; protect surface water uses (e.g., swimming, fishing, boating); and prevent degradation of public trust waters. Designated uses include swimming, boating, fishing, aquatic biota, aquatic habitat, aesthetics, drinking water source, and irrigation. The protection of water quality and water-related uses can be promoted by establishing specific management objectives for bodies and stretches of water, describing the values and uses of the surface water to be protected or achieved.

The VT Agency of Natural Resources is responsible for determining the presence of existing uses on a case-by-case basis or through the [Tactical Basin Planning](#) process. The Agency is also responsible for defining water resource management objectives to maintain or enhance those classifications.

To protect Vermont's surface waters and their designated uses, the VWQS establishes water quality classes with associated management objectives. There are four possible classifications of Vermont surface waters:

- B(2) – good;
- B(1) very good;
- A(2) public water source; and
- A(1) excellent.

All waters at or below 2,500 feet are designated Class B(2) for all uses, unless specifically designated as Class A(1), A(2), or B(1) for any use. As specified in the VWQS, all Vermont's surface waters are managed to, at a minimum, support designated uses valued by the public at water quality class B(2), also known as "good condition."

The VWQS also contains pathways to increase protection of high-quality waters. One such pathway is a process called **reclassification**. This process allows for water bodies demonstrating "excellent," also known as A(1), or "very-good," also known as B(1), water quality to be reclassified to one of these classes that better represents its actual conditions. The reclassification process measures various monitoring criteria and could include a higher standard of protection if specific criteria are met. All waters must continue to meet the criteria for their classification, otherwise they are then listed as impaired, and a restoration plan must be developed and implemented. The classification structure for all surface waters is established by the legislature and individual reclassification decisions are made through rulemaking by the Agency of Natural Resources Secretary pursuant to 10 V.S.A. § 1253. The public may petition the Agency to reclassify a waterbody for any of the designated uses.

Management objectives for class A(1) surface waters are to provide the highest level of protection (afforded by the VWQS) for these waters. The criteria for a water body to be reclassified to A(1) vary depending on which use type is at play and what type of water body is being assessed for reclassification. For Vermont's lakes and ponds, the VWQS contain numeric nutrient criteria that water bodies must meet or exceed, to maintain water quality in full support of existing aesthetic uses at the A(1) or B(1) levels.

However, reclassification **does not** mean there can be no land-based activities or active management in the watersheds, lakeshores, or stream corridors of watersheds that are (re)classified to A(1) for one or more uses. Instead, the activities must be carried out in such a way as to maintain the excellent condition of water bodies for those uses. Here is a description of the different water use types from the VWQS and how A(1) waters are intended to be managed to protect and maintain those uses:

1. **Aquatic Biota and Wildlife** - Waters shall be managed to achieve and maintain excellent biological integrity and aquatic biota and wildlife consistent with waters in their natural condition.

2. **Aquatic Habitat** - Waters shall be managed to achieve and maintain excellent quality aquatic habitat. The physical structure, stream processes, and flow characteristics of rivers and streams and the physical character and water level of lakes and ponds shall be managed consistent with waters in their natural condition.
3. **Aesthetics** - Waters shall be managed to achieve and maintain excellent aesthetic quality, as defined by water clarity, watercolor, water level, frequency of algae blooms, and other factors.
4. **Swimming and Other Primary Contact Recreation** - Waters shall be managed to achieve and maintain the highest quality in waters, in their natural condition with negligible risk of illness or injury from conditions that are a result of human activities (such as discharge of wastewater).
5. **Boating and Fishing** - Waters shall be managed to achieve and maintain excellent quality boating and fishing as compatible with the natural condition.
6. **Public Water Sources** - Waters shall be managed to achieve and maintain a uniformly excellent character and a level of water quality highly suitable for use as a public water source with filtration and disinfection or other required treatment.

The Lakes and Ponds Management and Protection Program (Lakes Program) is studying the possibility of reclassifying certain high-quality water bodies to a higher water quality class using nutrient criteria linked to maintaining the aesthetics category listed above (#3). Simply put, if a lake meets or exceeds certain thresholds for Total Phosphorus concentrations or related nutrient response conditions, it is eligible for reclassification (see VWQMS Table 3).

The linkage between these nutrient concentrations and the aesthetics used must meet the nutrient concentration thresholds in Table 3 to maintain excellent aesthetic water quality. VTDEC has yet to establish a data standard for reclassification from B(1) to A(1); however, we are using the data standard required to list a water body as impaired: five straight years of data showing that the lake's mean Total Phosphorus concentrations meet or exceed the A(1) criteria of 12 micrograms per liter (µg/L) (see Table 3). The Lakes Program is also currently performing statistical analysis of our lakes dataset to determine how many years of data are needed to be confident that a lake is maintaining a value at or below the A(1) threshold. Once this analysis is complete, we will update the [DEC Listing and Assessment Methodology](#) accordingly.

Let us look at a specific example. As a result of the hard work of many, water quality in Lake Willoughby (Westmore)—currently listed as a B(2) lake—is excellent and exceeds the Class A(1) requirements: the 5 year mean value for Total Phosphorus concentrations is 9.7 µg/L, chlorophyll-a is 1.5 µg/L and Secchi is 9.0 meters. Lake Willoughby is therefore eligible for reclassification as an A(1) lake. The designation of Lake Willoughby as a [National Natural Landmark](#) also adds weight to the concept of increased protection. Interestingly, given the

VWQMS Table 3. Combined Nutrient Criteria for Aesthetics Uses in Lakes Ponds and Reservoirs Except for Lake Champlain and Lake Memphremagog^{1,2}
From: Vermont Water Quality Standards, Environmental Protection Chapter 29A, page 30

	Class A(1)	Classes A(2) & B(1)	Class B(2)
Nutrient Concentrations			
Total Phosphorus (TP) ³ (µg/l)	12	17	18
Nutrient Response Conditions			
Secchi Disk Depth (meters) ⁴	5.0	3.2	5.6
Chlorophyll-a (µg/l) ³	2.6	3.8	7.0
pH	Not to exceed 8.5 standard units.		
Turbidity	Consistent with the criteria in § 29A-302(4) of these rules.		
Dissolved Oxygen	Consistent with the criteria in § 29A-302(5) of these rules.		
¹ Compliance with nutrient criteria shall be achieved either by compliance with the nutrient concentration values specified above or by compliance with all nutrient response conditions. In situations where the applicable nutrient compliance conditions are not met as a result of nutrient enrichment, the Secretary may establish alternate nutrient concentration values on a site-specific basis, as necessary, to achieve compliance with the nutrient response conditions. All waters shall maintain a level of water quality that provides for the attainment and maintenance of the water quality standards of the downstream waters. ² Applies to lakes and reservoirs greater than 20 acres in surface area with a drainage area to surface area ratio less than 500:1, excluding Lake Champlain and Lake Memphremagog. ³ June thru September mean no to be exceeded in the photosynthetic depth (euphotic) zone in a central location in the lake. ⁴ June through September mean not to be less at a central location in the lake.			

excellent condition of Lake Willoughby's lake trout community, VTDEC could also consider reclassifying the lake to A(1) for fishing uses, which might help bring in additional stakeholders.

It is also worth considering how to increase protections today for lakes with stable Total Phosphorus concentrations and excellent water quality. Lake Raconda (Wilmington), currently classified as B(2), is a good example. Lakes Program research shows increases in Total Phosphorus concentrations in oligotrophic waters across the state, even in watersheds with relatively little disturbance. Lakes with an A(1) or B(1) classification would allow VTDEC and other stakeholders to mobilize resources to address water quality challenges if nutrient concentrations deteriorated from the higher classification to the next level down, and before the lake became "impaired," or not meeting the B(2) requirements. In other words, if Lake Raconda was reclassified to A(1) status, and then slipped to B(1) status, VTDEC would be able to implement activities to restore Lake Raconda's A(1) status.

If any lake association believes their associated lake(s) meet the criteria for A(1) reclassification and is interested in having a discussion on the benefits and challenges associated with reclassification, members can contact Vermont DEC's Lakes and Ponds Program for more information. There is no legal requirement to reclassify lakes that meet the standards for additional protection. However, certain lakes are eligible for reclassification because they meet or exceed the requirements for an A(1) lake under the numeric nutrient criteria as defined in Table 3. They include Raconda (Wilmington), Shadow (Glover), Caspian (Greensboro), Seymour (Morgan), Rescue (Ludlow), Maidstone (Maidstone), Harveys (Barnet), and Willoughby (Westmore). Lakes can also be reclassified to B(1) via the numeric nutrient criteria; however, initially the Lakes Program is most interested in increasing protections for lakes meeting the A(1) criteria, as part of its effort to protect the "best of what's left."

There is a compelling argument to increase protections for lakes with excellent water quality today but where summer Total Phosphorus concentrations are increasing, to ensure water quality deterioration does not lead to decreased usage and reduced recreational opportunities. While the Lakes Program is in the process of defining the data requirements for reclassification, we anticipate that any lake or pond with at most five consecutive years of mean summer Total Phosphorus concentration at or below the threshold for A(1) or B(1) waters will be eligible for reclassification to that status. VTDEC Lay Monitoring Program data and VTDEC-conducted summer lake assessments are generally used to assess a lake's status. To assess any given lake with the required data against the numeric nutrient criteria, a lake association can visit the VTDEC Lay Monitoring Program [webpage](#) or review the [Lake Scorecard](#).

Reclassification Frequently Asked Questions

What are the management implications of reclassification to A(1)?

The benefit of reclassification is that the lake is placed into a water quality class that better reflects its actual condition, and the threshold for declaring the lake as a lake with deteriorating water quality is dramatically lowered. There are also certain existing management restrictions for A(1) waters in Vermont. Activities in the watersheds or stream corridors of Class A(1) surface waters can be continued except for the restrictions below.

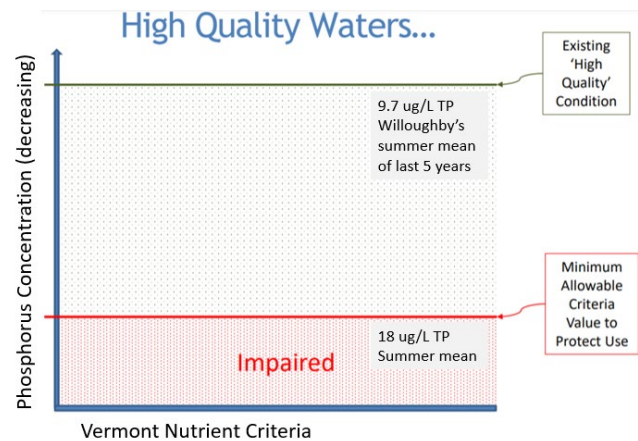
- A direct discharge of any wastes that, prior to treatment, contained organisms pathogenic to human beings. (10 V.S.A. § 1259)
- New indirect discharge systems (e.g., in-ground septic system) with a design flow greater than 1,000 gallons per day. The design flow of an existing soil-based system that discharges to Class A waters may not be increased if the total design flow will exceed 1,000 gallons per day. In addition, for a permit to be issued, there must be no more than one soil-based disposal system per lot and no more than one lot per application. (10 V.S.A. § 1259)
- The Solid Waste Management Rules prohibit siting solid waste management facilities (§ 6-702) and application of biosolids or septage (§ 6-1306) in Class A watersheds.

Where are most lakes classified currently?

Most lakes in the state are currently classified as B(2) waters, meeting the nutrient requirement of a mean summer TP value at or below 18 µg/L. See this line shown in red in the figure to the right. Any B(2) lakes in the state with a mean summer TP values exceeding 18 µg/L would be considered impaired.

Taking the example of Lake Willoughby again where the mean summer TP value for the last 5 years is 9.7 µg/L (but annual values are increasing), there is a lot of assimilative capacity left on the lake for phosphorus levels to increase before the lake's summer TP concentration reaches the current B(2) criteria of 18 µg/L and it is listed as impaired for aesthetics.

Now, where TP concentrations in Lake Willoughby continue to increase, listing Lake Willoughby as impaired for aesthetics or nutrient enrichment will not happen until degradation is so far gone that restoration is less likely, at least not without expensive and potentially unpopular interventions in the watershed, along the lakeshore and in the lake. It would also take a significant amount of restoration work if action was delayed until Total Phosphorus levels exceeded the current B(2) criteria of 18 µg/L. There is a good likelihood that by then it would be too late to fully restore the lake. By reclassifying to A(1), means the mechanism to initiate lake restoration actions earlier is being put into place, when the lake's TP concentration exceed 12 µg/L. The Lakes Program believes the A(1) nutrient criteria better fit the expectations for Willoughby's aesthetic use. A more appropriate criterion and threshold to use for this lake given our available data is 12 µg/L. The nutrient response conditions we measure, chlorophyll-a and secchi, also support reclassification to A(1) and better reflect Lake Willoughby's current state.



Does reclassification guarantee Total Phosphorus levels will not be exceeded?

Reclassification is not a guarantee that the Total Phosphorus levels will not be exceeded. Rather, reclassification puts into place a mechanism for action sooner when the likelihood of restoration success could be achieved at much lower cost. In the Lake Willoughby example, reclassification presents the tool of legal requirements that come with listing a water as impaired (in this case for A(1)) and in particular helps make funds available sooner for restoration work. This 'increased protection' is afforded the lake even if no other legal lake protections are established by the state through the reclassification process.

Why consider reclassification?

Reclassification to A(1) status introduces some new water quality protections required under statute in Vermont, as mentioned above. But the principal rationale for reclassification is to place a lake into the appropriate class corresponding with its actual status and create a mechanism for a restorative action sooner when the lake becomes impaired for A(1) uses. DEC Lakes and Ponds Program believes that an A(1) lake could be eligible for additional technical assistance and funding to 1) keep its total phosphorus concentrations from ever exceeding 12 µg/L and becoming impaired for A(1) and 2) to restore it to A(1) in the event that it does become impaired for A(1), similar to efforts made to restore lakes that have been found to be impaired for the B(2) class. The funding sources for this work could be the future Act 76 Water Quality Enhancement Grants, current VT Clean Water Program, and other federal, state, and local water-quality related grant opportunities. A(1) status should provide a lake with a unique and "blue-ribbon" label that places it in an elite category in the state, if not the nation as what we are hoping to do through upwards reclassification of high-quality waters has not been done extensively yet. A(1) status can be referenced in any funding proposal or decision-making process and should put A(1) lakes at or near the top of the list for water quality-related work.

We are essentially stating that rather than waiting for lakes to become impaired for B(2) and then spend millions to restore them (Carmi, Memphremagog, Champlain), let us invest funds to maintain high-quality waters where

it is more cost-effective and makes more sense from an ecological standpoint as well. If an A(1) water were to become impaired for A(1), reclassification would provide legal requirements that come with listing a water as impaired and would help make funds available sooner for restoration work.

A secondary goal and possible outcome of reclassification is the identification of additional protections or “management implications” to address current *and* anticipated stressors to a lake (e.g., increased external nutrient loading from surface water runoff) and ensure that the overall effort to reclassify a waterbody is worthwhile. Any potential “management implications” are still just conceptual ideas currently under discussion, and DEC recognizes that any additional protection measures must not be too restrictive to eliminate support from other actors in the lake watershed. Therefore, any additional or proposed protections will be tailored to each lake’s individual stressors through a lake-specific “protection plan” and/or the rulemaking process that designates a waterbody into a specific class, although there may be some elements common to *all* A(1) or B(1) lakes. Examples of potential management implications that could accompany a reclassification effort include:

- **Agriculture:** Maintain existing ban on winter manure spreading, provide financial incentives for buffers, right-size new manure pits, and prioritize Required Agriculture Practices that are lake-friendly.
- **Logging:** Require implementation of accepted management practices.
- **Roads:** Provide guidance on salt application, and no mowing between road and lake if the road is in shoreline protection zone (already part of municipal road general permit).
- **Properties in shoreland protection zone:** Possible enhancements to requirements in the Shoreline Protection Act to reduce runoff from impervious surfaces.
- **Act 250 and large development projects:** Comply with existing statute about indirect discharge (limit of 1,000 gallons per day for a new septic system) as well as some possible buffer requirements.
- **Broad “Lake Friendly” requirement:** Require a minimum buffer width of 50 feet for all streams in an A(1) watershed, especially important for A(1) eligible lakes with significantly increasing total phosphorus concentrations, such as Caspian Lake and Shadow Lake (Glover).

What is the process for reclassification?

The State of Vermont can reclassify water bodies¹, or respond to petitions from local organizations, which is preferable as it demonstrates local support for this approach. The process for submitting a petition is available on the [VTDEC webpage](#) and follows a formal rulemaking process. Under current review is a petition from the Town of Ripton to reclassify some stream segments in Addison County. The process involves significant consultation with local and state stakeholders as well as legislative committees and will likely require some degree of local support to move forward.

Has reclassification been done before?

In 2016, VTDEC reclassified a series of surface waters in the Green Mountain National Forest, re-designating them as class A(1) for specifically identified designated uses. This was the first protective reclassification of surface waters conducted in Vermont since 1988. More info is available [here](#) and [here](#). There are at least ten lakes eligible for reclassification to A(1) status in Vermont based on Lakes program existing data. The Lakes Program is working with some of these lake associations to see if there is interest in working with us on reclassification.

¹ In 2012, pursuant to §§20 – 26 of Act 138, rulemaking authority and the consideration of petitions under this authority for the VT WQS was transferred from the Water Resources Panel to the Agency of Natural Resources.