# Representative Lakes (A2)

## Description

This component is a subset of lakes and ponds that occur in Vermont, representing the majority of lake types and examples of each type that are in the best condition for that type. While all lakes and ponds are included in the Surface Water and Riparian Areas component, only 100 lakes and ponds are selected for the representative lakes component. The lakes and ponds were classified based on their trophic status, depth, and alkalinity, which are generally the main factors that shape biological communities in lakes (Wetzel 2001).

## Ecological importance

Lakes and ponds provide critical habitat for many species of fish, amphibians, reptiles, invertebrates (e.g., insects, mussels, snails, worms, freshwater sponges), and plants. They also provide supporting habitat for many terrestrial wildlife species such as otter, mink, deer and moose. The distribution of species found in Vermont's lakes and ponds is partially the result of variations in their physical and chemical nature. The lakes and ponds in this component are therefore a tool for ensuring that this physical and chemical variation and the aquatic habitats and species assemblages they support are adequately represented.

## Representative Lakes Conservation Goal

To conserve examples of all of Vermont's lake and pond types, including the preservation, maintenance or restoration of the ecological integrity of aquatic habitats and their riparian areas and watersheds.

## Component Mapping Goal

To classify Vermont's lakes and ponds based on best available data and to identify and map the highest quality examples of all lake and pond types. The selection of lakes and ponds should ensure that all lake and pond types are represented, and that for each type, the examples that are in the best ecological condition are included.

## Source Data and Selection Criteria

### Lakes and Ponds Management and Protection Section, Vermont Dept of Environmental Conservation

#### Description

The Vermont Department of Environmental Conservation's Lakes & Ponds Management and Protection Section maintains an extensive database on the biological, physical, and chemical status of 871 lakes and ponds.

#### Selection Criteria

The 100 lakes and ponds selected (table X) are classified based on alkalinity and trophic status into 20 types, with Lake Champlain treated separately. Lakes and ponds were selected based on condition criteria, including naturalness of the outlet, water quality, milfoil abundance, degree of acid impairment, and lack of seasonal drawdown. Three additional lakes with special physical features were also added to the selection. Lily Pond, in Vernon, is included because of its similarity

to ponds in the coastal plain. Lakes Champlain and Memphremagog are included because of their size and the extensive fisheries they support despite not meeting three other standards.

**Table 1. Representative Lakes**

| | Low Alkalinity | | Moderate Alkalinity | | High Alkalinity | |
|---|---|---|---|---|---|---|
| | Lake | Pond | Lake | Pond | Lake | Pond |
| **Dystrophic** | Wheeler (Brunswick) | Dennis<br>McConnell<br>Notch<br>South America<br>West Mountain<br>Wolcott | | | | |
| **Oligotrophic** | Little Averill*<br>Great Averill* | Norford* | Miller*<br>Crystal*<br>Willoughby* | | Caspian* | Mitchell* |
| **Mesotrophic** | Beaver (Holland)<br>Holland<br>May<br>Ricker | Kettle, Lewis, Lily (Londonderry), Little, Elmore, Nulhegan, Osmore, Paul Stream, Schofield, Stratton Athens, Gates, Gillett, Hancock (Stamford), Kenny, Lakota, Lowell, Shippee, Turtlehead, Lily (Vernon), McAllister, Pigeon, Tiny, Ninevah | Buck<br>Center<br>Long (Greensboro)<br>Long (Sheffield)<br>Perch | Bruce<br>Daniels<br>Flagg<br>Fosters<br>Horse<br>Lower Symes<br>Stannard<br>Abenaki, Milton, Mud (Peacham), Old Marsh<br>Upper Symes<br>Mudd | Emerald<br>Ewell<br>Rood<br>Warden<br>Berlin | Coits<br>Half Moon<br>Johnson (Orwell)<br>Mud (Leicester)<br>Chandler<br>Jobs<br>Keiser<br>Little Hosmer<br>North (Brookfield)<br>Bean (Lyndon)<br>South (Brookfield) |
| **Eutrophic** | Minards<br>Silver (Georgia) | Little (Franklin)<br>Mile<br>Spruce (Orwell) | Harriman (Newbury)<br>High (Sudbury)<br>Spring (Shrewsbury)<br>Colchester | Burr (Pittsford)<br>Mud (Morgan)-N<br>Toad (Charleston) | Long (Milton)<br>Zack Woods<br>Vallley<br>Great Hosmer<br>Hough, Memphremagog*<br>Round (Milton)<br>Inman | Bliss<br>Tildys<br>Winona |
| **Lake Champlain** | Lake Champlain includes parts in different trophic levels. | | | | | |

*denote exceptions to rules, but best examples in designation.

## Component Strengths

The lakes classification is based on high quality data from the statewide lakes and ponds inventory and is a good representation of Vermont's lake and ponds types. The filter for various condition factors uses a separate comprehensive dataset which ensures that the best examples of each type are included.

## Component Limitations

The lakes classification does not incorporate biological data as it was not available for all lakes.

## Component Weight and Justification

Representative lakes were assigned a weight of 4 out of 10. This low weighting is based on the importance of conserving representative lake and pond types, tempered with the lack of biological data incorporated into the classification and the fact that all lakes and ponds are already included under the Surface Water and Riparian Areas and Riparian Connectivity components.

## Summary Statistics for Representative Lakes

**Table 1. BioFinder component datasets, component weights, and the distribution (%) of components across tiers**

| Data # | Weight | Component | Tier 1 Greatest | Tier 2 Very High | Tier 3 High | Tier 4 Moderate | Tier 5 Low |
|---|---|---|---|---|---|---|---|
| **Landscapes** | | | | | | | |
| L1 | 7 | Habitat Blocks | 12.7% | 18.1% | 30.1% | 39.1% | 0.0% |
| L2 | 3 | Grasslands & Shrublands | 4.3% | 20.8% | 22.7% | 10.9% | 41.3% |
| L3 | 9 | Rare Physical Landscape | 15.7% | 53.9% | 11.0% | 19.4% | 0.0% |
| L4 | 4 | Representative Physical Landscape | 17.2% | 19.1% | 43.4% | 13.7% | 6.6% |
| L5 | 7 | Connecting Lands (<2000ac) | 10.1% | 23.4% | 19.1% | 47.4% | 0.0% |
| L6 | 4 | Connecting Blocks | 9.2% | 12.2% | 24.0% | 51.8% | 2.7% |
| L7 | 3 | Anchor Blocks | 12.1% | 19.7% | 35.3% | 32.7% | 0.1% |
| L8 | 8 | Riparian Connectivity | 36.4% | 52.9% | 10.8% | 0.0% | 0.0% |
| L9 | 4 | Wildlife Road Crossings | 12.8% | 28.1% | 20.9% | 26.8% | 11.4% |
| **Aquatics** | | | | | | | |
| A1 | 6 | Surface Waters & Riparian Areas | 31.1% | 48.6% | 12.9% | 7.4% | 0.0% |
| **A2** | **4** | **Representative Lakes** | **10.3%** | **84.5%** | **5.3%** | **0.0%** | **0.0%** |
| A3 | 8 | Important Aquatic Habitats & Species Assemblages | 19.9% | 75.2% | 4.9% | 0.0% | 0.0% |
| **Species & Natural Communities** | | | | | | | |
| SN1 | Tier 1 | Rare Species | 100.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| SN2 | 6 | Uncommon Species | 62.1% | 21.7% | 10.0% | 6.1% | 0.0% |
| SN3 | Tier 1 | Rare Natural Communities | 100.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| SN4 | 6 | Uncommon Natural Communities | 57.4% | 31.0% | 11.4% | 0.2% | 0.0% |
| SN5 | 3 | Common Natural Communities | 9.8% | 52.9% | 37.1% | 0.2% | 0.0% |
| SN6 | 7 | Vernal Pools (Confirmed) | 20.5% | 57.0% | 8.3% | 14.1% | 0.0% |
| SN7 | 5 | Vernal Pools (Potential) | 6.0% | 30.1% | 52.3% | 2.4% | 9.2% |
| SN8 | 8 | Wetlands | 60.9% | 31.0% | 5.1% | 3.0% | 0.0% |
| SN9 | 4 | Mast production areas | 10.3% | 49.3% | 35.2% | 4.0% | 1.2% |

The sum of percentages for each component is 100.

## References

Wetzel, R.G. 2001. *Limnology: Lake and River Ecosystems.* Academic Press; 3 edition.

## For more information

A complete report on BioFinder development, methods and findings, including all 21 component summaries can be found at www.BioFinder.vt.us. For more information specific to this component, contact Kellie Merrell, Vermont Department of Environmental Conservation Lakes & Ponds Management & Protection Section, 802.595.3538, kellie.merrell@state.vt.us