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| DATE : | July 23, 2014 |
| TO : | Carol Sinden, Miranda Nichols, and Douglas Hansen  Water Assessment Section  Environmental Analysis and Outcomes Division |
| FROM : | Pam Anderson  Water Quality Monitoring Unit  Surface Water Monitoring Section  Environmental Analysis and Outcomes Division |
| PHONE : | (651) 757-2190 |
| SUBJECT : | Request to remove Clifford Lake (21-0003-00) from the 303(d) Impaired Waters list |

Clifford Lake was listed in 2006 as a shallow lake for eutrophication. At the time of the original assessment, no depth information was available on the basin. During TMDL development for downstream lakes, a depth survey was completed and information was collected to help properly categorize the basin. Based on the shallow depth (~3 feet), unconsolidated substrate, and the dominance of aquatic vegetation, it is recommended that Clifford Lake be removed from the 2016 Impaired Waters List as a correction – the basin has characteristics more in line with a wetland than a lake.

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| **Factor** | **Lakes** | **Shallow lakes** | **Wetlands** | **Clifford 21-0003** |
| **Protected Waters Inventory Code** | Typically coded as “L or LP” in PWI | May be coded as either “L, LP or LW” in PWI | Typically coded as a “LW” in PWI | P |
| **Depth, maximum** | Typically >15 feet | Typically < 15 feet | Typically < 7 feet | 3.5ft recent survey |
| **Littoral area** | Typically <80% | Typically >80% | Typically 100% | 100% |
| **Area (minimum)** | > 10 acres (Bulletin 25) | > 10 acres (Bulletin 25) | No minimum | 151ac (Bulletin 25) 174ac recent survey |
| **Thermal stratification (summer)** | Stratification common but dependant upon depth, size and fetch | Typically do not thermally stratify | Typically do not stratify. | Does not thermally stratify |
| **Fetch** | Significant fetch depending on size & shape; | Fetch is variable depending on size & shape; | Rarely has a significant fetch; | 0.74 miles |
| **Substrate** | Consolidated sand/silt/gravel | Consolidated to mucky | Mucky to unconsolidated | Mucky, not consolidated |
| **Shoreline features** | Generally wave formed, often sand, gravel or rock | Generally wave formed, often sand, gravel or rock | Generally dominated by emergents | Dominated by emergents |
| **Emergent vegetation & relative amount of open water** | Shoreline may have ring of emergents; vast majority of basin open water. | Emergents common, may cover much of fringe of lake; basin often has high percentage of open water. | Emergents often dominate much of basin; often minimal open water. | Emergents common, cover much of fringe of lake; basin has high percentage of open water. |
| **Submergent vegetation** | Common in littoral fringe, extent dependant on transparency | Abundant in clear lakes; however may be lacking in algal-dominated turbid lakes. | Common unless dominated by an emergent like cattail. | Dominated by emergents "cattails" Also algal bloom limited |
| **Dissolved Oxygen** | Aerobic epilimnion; hypolimnion often anoxic by midsummer | Aerobic epilimnion but wide diurnal flux possible | Diurnal flux & anaerobic conditions common | No data available |
| **Fishery** | Typically managed for a sport/game fishery. May be stocked. MDNR fishery assessments typically available. | May or may not be managed for a sport fishery. If so, fishery assessment should be available. Winter aeration often used to minimize winterkill potential. | Typically not managed for a sport fishery. Little or no MDNR fishery information. Seldom aerated May be managed to remove fish & promote waterfowl. | Not managed for a sport fishery. Little or no MDNR fishery information. Limited use by fish as spawning habitat |
| **Uses** | Wide range of uses including boating, swimming, skiing, fishing; boat ramps & beaches common | Boating, fishing, waterfowl production, hunting, aesthetics; limited swimming; may have boat ramp, beaches uncommon | Waterfowl & wildlife production, hunting, aesthetics. Unimproved boat ramp if any. No beaches. | Waterfowl & wildlife production, hunting, aesthetics. No boat ramp if any. No beaches. |