



Homemade Sampling Gear: Making a Secchi Disk

The secchi disk depth is influenced by the amount of suspended plankton and other non-living particles (dirt, small pieces of organic material) in the water. Young game fish depend on plankton as food sources. Many species of baitfish feed on plankton.

Fish that depend upon vision to capture their food may be replaced by bullhead and other fish that feed by touch and odor if waters are constantly turbid from siltation. Turbidity caused by excess algae may indicate that oxygen levels are depleted. In this type of water, only fish that survive in low-oxygen environments, such as carp and member of the catfish family, may be present.

Biologists also use the secchi disk on ponds, lakes and slow moving rivers to determine the productivity of a given water. Unproductive waters have little turbidity, so the secchi disk can be lowered very deep (30 or more feet). Productive waters can have secchi disk depths of a few feet to a few inches.

Recently, observations have been made about the impacts of zebra and quagga mussels on algae-related turbidity. In zebra mussel-infested waters, the clarity of the water has improved dramatically due to the capacity of these organisms to filter huge amounts of water. This reduction of plankton can lead to game fish population crashes.

Building and Using a Secchi Disk:

A secchi disk is used to measure turbidity. By lowering the secchi disk until the black and white pattern is no longer visible, and noting the depth, a relative measure of turbidity may be obtained. Use the secchi disk to compare the productivity/ turbidity of a number of different lakes or ponds. It may also be interesting to measure the productivity/ turbidity of a lake or pond during different times of the year.

Materials Needed:

1. Wood (plywood works best) or 1/4" plastic disk, 6 to 8 inches (15-20 cm) diameter (the top of a large juice can or metal pie plate will work)

2. Hand drill
3. Black and white paint--exterior grade, flat
4. 20-50' piece of parachute cord or other nylon rope
5. Large metal washers (several ounces for each disk)
6. Eye bolt, three nuts and washer for each disk.
7. Stick or wooden dowel, about 1 foot (30 Cm) long
8. Two waterproof markers, different colors

Building the Secchi Disk:

1. Paint entire disk with white paint. If using wood, be sure to cover all exposed surfaces and edges.
2. Drill a hole large enough for the eyebolt to pass through in the center of the wood or plastic disk. Thread one nut on eyebolt, followed by washer. Put eyebolt into disk and place washer and nut on bottom. Tighten. (Sequence should be eyebolt, nut, washer, disk, and washer nut. Washers used for weight threaded on bottom of eyebolt, held on with remaining nut.)
3. Divide the disk into quarters and paint alternating sections black and white.
4. Tie rope to eyebolt.
5. Tie the free end of the rope to the stick or wooden dowel.
6. Use the marker to mark off distances on the rope every 6 inches (or every 10 cm if metric).
Fore example, mark every 1-foot interval (or 1 mete) with a red mark and every 6-inch (10 cm) interval with a blue mark.

Using the Secchi Disk:

1. Hold onto the stick and rope, and lower the secchi disk into the water until you can no longer see the painted surface.
2. Using the marks on the rope, determine how deep the secchi disk is when you lose sight of the black and white pattern, or the depth at which it reappears as you bring it back up.
3. This depth is your measure of turbidity. Use the same method each time you measure your turbidity. Is there any relationship between fish caught and turbidity? Does turbidity affect the color of the lure you use?
4. In this water, light travels to depths of twice the secchi disk depth. Below this depth little light penetrates.