Water Primrose 2005
Lake Murray, South Carolina

Water primrose, an emergent plant, has become prevalent along the shoreline throughout much of Lake Murray. It became established at the water's edge during the extended drawdown of 2003 - 2004 (fig 1) and continued to thrive as water levels rose to normal high seasonal levels. The 346-foot contour can readily be seen by the location of the deeper primrose beds.

Fig 1

Water primrose established at the 346' drawdown zone in September 2004.

Lake levels during the growing season of 2005 have primarily been between 357' and 358' msl. These high levels have had little to no impact on the water primrose plants established at the 346' drawdown zone. The primrose growth rate was able to keep up with the water levels as the lake refilled after the drawdown (fig 2).

Fig 2

Water primrose beds thriving at the 346' drawdown zone during high water levels (358') in August 2005.

Most of the sampling this year was accomplished while the lake level was at 358 ft. Water primrose beds are found in shallow water along the shoreline, as well as at the 346' drawdown level. These deeper beds generally occupy the 10 to 12 foot depths – 346' to 348' levels – but some beds are established in as much as 17 feet of water – at the 341' level.

Approximately 145 miles of shoreline are infested with primrose throughout the lake. The greatest amount of growth and the most significant problems are found in the Saluda and Little Saluda Rivers. Over one-third of all the water primrose in Lake Murray is found in the Saluda and Little Saluda Rivers. Over 54 miles of the rivers' shorelines are affected by water primrose. This area also has a large number of beds established at the 346' drawdown zone.

Fig 3

Extensive growth of water primrose in a cove on the Little Saluda River

The Upper Lake is the area between the confluence of the Saluda and Little Saluda Rivers and the 'Gap' at Billy Dreher Island. The Upper Lake has primrose beds along 22 miles of shoreline

The main body of the lake, from the 'Gap' at Billy Dreher Island to the dam has over 68 miles of shoreline infested with water primrose. Many of the primrose beds in the main part of the lake are small shoreline patches, rather than extensive shoreline beds. The north side of the lake has considerably more than the south side, nearly 50 miles of primrose beds, compared to less than 20 miles along the south side.

Table 1. Summary of primrose infestations

Saluda River	20.8 miles of shoreline
Little Saluda River	33.6 miles of shoreline
Upper Lake	22.6 miles of shoreline
Main Lake, south side	19.3 miles of shoreline
Main Lake, north side	49.1 miles of shoreline
Total	145.4 miles of shoreline

Water primrose and alligatorweed have been present in Lake Murray for decades. Water primrose has been one of the primary reasons for many of the aquatic plant complaints made to SCE&G and SCDNR for many years; hydrilla complaints often turned out to be water primrose infestations. Although not restricted to the upper part of the lake, water primrose has always been more prevalent in the upper lake, often growing to nuisance levels. However, in the case of water primrose, nuisance levels meant that one, or only a few, property owners were impacted by primrose infestations. Sometimes, an entire cove would be affected, but usually nuisance primrose levels were limited in extent.

There is a strong correlation between shoreline disturbance and locations of water primrose beds. Wherever the natural shoreline vegetation has been removed, water primrose beds tend to occur. Shoreline beds of water primrose also occur along naturally vegetated shoreline areas, but they're more commonly found along disturbed shorelines. This has been noted for many years; however, the beds of water primrose established at the 346' drawdown area are now found in naturally vegetated areas as well as in disturbed areas – see figure 3. For infestations at 358' level, disturbed shorelines continue to have more water primrose than undisturbed shorelines.

Other Aquatic Plants

Alligator weed, *Alternanthera philoxeroides*, is present in many of the water primrose beds, sometimes in abundance. Two species of emergent plants were found this year in the lake that haven't been reported before – creeping burhead (*Echinodorus cordifolius)* and water pennywort (*Hydrocotyle ranunculoides)*. Creeping burhead is usually a species of marshes and swamps, but can occur along lake shorelines in shallow water. Water pennywort, previously known only from the coastal plain, was found in one water

primrose bed in the upper part of the lake. This species has the potential to form large floating mats; however, it's usually found during the fall, winter and spring and it usually dies back in the summer.

Although hydrilla wasn't specifically a search target, no hydrilla was found during the course of the primrose survey.

Herbicide Treatment

An area on the north side of the Little Saluda River, near the western boundary of the Lake Murray project area, was treated with the aquatic herbicide, Renovate. Figures 4 and 5 show one section of the treatment area before and after herbicide application. I've received anecdotal information that lake residents and users are using Roundup in places to control the primrose.

Figure 4

Cove in May prior to herbicide application

Figure 5

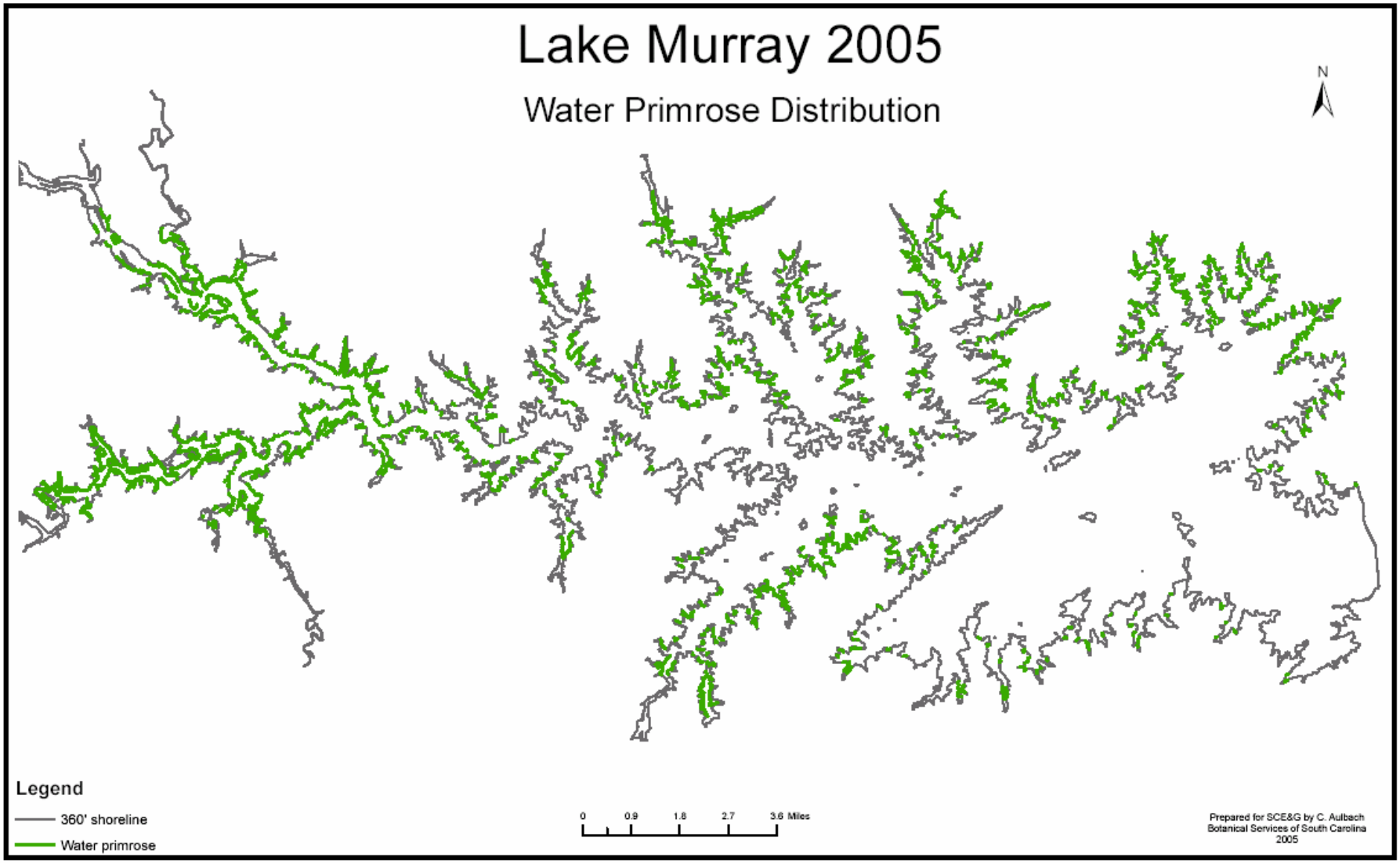
Same cove in August after herbicide application

Summary

During the 2003-2004 drawdown of Lake Murray, water primrose became established at the 346' level, particularly in the upper part of the lake. It now occupies 145 miles of shoreline throughout the lake, with beds occurring along the shoreline as well as in deeper water.

Water primrose can't establish itself in deep water (10-12 feet), however, once established, it can persist and even thrive in deep water. There are a few places in Lake Murray where the primrose died back during the summer; however, in most areas, it continues to thrive in the deeper areas.

Herbicide application by well-intentioned lake users and residents is an issue that must be addressed. Physical removal by hand and by rakes was noted at a small number of properties. This is the most effective and the only available means by which lake users can and should control water primrose.


Lake Murray 2005
Water Primrose Distribution
N
Legend
360' shoreline
Water primrose
0 0.9 1.8 2.7 3.6 Miles
Prepared for SCE&G by C. Aulbach
Botanical Services of South Carolina
2005