

2007 Statewide Survey of the Status of Giant Salvinia and Hydrilla in Mississippi



A Report to the Mississippi Bureau of Plant Industry

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Introduction

Invasive aquatic plant species have been implicated in the degradation of water resources worldwide (Petr 1993). The introduction and growth of invasive aquatic plant species may limit the water body function and impede boat traffic (Albright et al. 2004, Oliver 1993, Madsen 2005). In the state of Mississippi, water bodies are mainly used for transportation, recreation, and habitat for fish and wildlife; all of which are threatened with the introduction of invasive aquatic plant species. The two species hydrilla (*Hydrilla verticillata*) and giant salvinia (*Salvinia molesta*) are considered invasive aquatic plants worldwide. Giant salvinia is a free-floating aquatic fern that can double biomass in 10 days through vegetative reproduction. Hydrilla is a submersed aquatic plant that can propagate from stem fragments, turions, and subterranean tubers representing a triple threat for management methods. Both plants are listed as noxious weeds on both the Federal Noxious Weed List and the Noxious Weed List for the State of Mississippi. Implementation of monitoring and management programs is needed for early detection of and prevention of their introduction, establishment and spread in any water body. Pursuant to that, Mississippi State University has developed a Memorandum of Agreement with the Mississippi Bureau of Plant Industry to survey water bodies in Mississippi for aquatic plants listed on the state noxious weed list. This memorandum of agreement has been renewed over the last three years as part of a monitoring program for the state. The following report is an update of the survey progress for giant salvinia and hydrilla presence in the state of Mississippi.

Methodology

Statewide surveys have been conducted since 2005 in the state of Mississippi to detect the presence and absence of giant salvinia and hydrilla. Known locations reported with either hydrilla or giant salvinia present in 2006 (Robles et al. 2007) were revisited in 2007 to document establishment and spread. A handheld computer with Global Position System (GPS) capabilities has used to obtain geographic coordinates of surveyed locations. Data were acquire and reported in latitude and longitude, datum WGS 84. Location maps were produced using ArcGIS-ArcMap, v. 9.1.

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Giant Salvinia and Hydrilla Status

Presence and absence of giant salvinia and hydrilla from 2005 to 2007 in the state of Mississippi are presented in Figures 1-3. To date in 2007, a total of 37 counties have been surveyed including reservoirs, waterways and major rivers. Current known locations of each species with their respective geographic coordinates are reported in Table 1 and 2.

Giant Salvinia Status

1- Wedgeworth Creek

The giant salvinia population still persists in Wedgeworth Creek, Forrest County, MS. (Figure 3). It was found at the mouth of Wedgeworth Creek which drains into the Leaf River (Figure 4). It is likely to spread into the Leaf River, so additional surveys in the future are warranted. Several tributaries south of Wedgeworth creek were surveyed, but giant salvinia was not found. At the time of the survey, 100% coverage of giant salvinia is still found under the bridge at Sims Road, representing a significant source of plant material to spread (see cover sheet photo). Biological control agents, specifically *Cyrtobagous salviniae*, were introduced to this area in 2006 by the Mississippi Department of Agriculture and Commerce to suppress giant salvinia growth. However, giant salvinia still persists along Wedgeworth creek. If possible, sites with giant salvinia should be treated with herbicide as soon as possible to prevent further spread.

2- Pascagoula River

An extensive two-day survey was performed east and west of the Pascagoula River, including bayous and oxbows related to former known locations of giant salvinia in 2005. To date, giant salvinia has not been found in this water body. However, associated aquatic plant species such as *Pontederia cordata* have been found in locations that formerly had giant salvinia, indicating that water quality may not be a limiting growth factor at these locations. It is suggested that giant salvinia may have been eradicated at this location through a combination of the increased salinity and storm surge from Hurricane Katrina, and follow-up chemical control by the Mississippi Department of Marine Resources. Further follow up surveys are warranted.

Hydrilla Status

1. Tennessee-Tombigbee Waterway

Populations of hydrilla at lakes Columbus, Aberdeen, Aliceville, and Gainesville still persist and are well established. At all lakes, hydrilla is localized next to boat ramps and small coves. In 2006, hydrilla was reported locally in the northeastern portion of Lake Columbus (Robles et al. 2007). Currently, hydrilla has spread to the southeastern portion of the lake. It is suggested that a reason for its spread is the fact that waterhyacinth has been under management using herbicides since 2005. Because shading of hydrilla by

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waterhyacinth is no longer limiting its spread it is likely that hydrilla will become widespread over the next years.

2. Ross Barnett Reservoir

Populations of hydrilla are located in the northern portion of the lake covering a total of 407 acres. Since 2005, hydrilla has been under management using herbicides successfully limiting its establishment. Although hydrilla still persists as individual plants and fragments, asexual propagules (e. g. tubers) have not been found (Wersal et al. 2007).

Conclusions and Recommendations

Giant salvinia has already escaped into the Leaf River. Many southward tributaries related with the Leaf River located in Perry, Greene, George and Jackson counties have been surveyed, however, giant salvinia have not been found in any of them. Further surveys are recommended in order to monitor the establishment of giant salvinia in southeast Mississippi. The giant salvinia population in the Pascagoula River delta reported in 2005 before Hurricane Katrina has not reestablished according to extensive surveys in 2006 and 2007.

Hydrilla still persists in Ross Barnett Reservoir and Tennessee-Tombigbee Waterway. At the latter, the implementation of a hydrilla management plan it is highly recommended to suppress hydrilla populations and prevent future spread to nearby water bodies. The hydrilla population reported at the Noxubee National Wildlife Refuge in 2006 (Robles et al. 2007) is no longer present due a continuous drawdown at Lake Loakfoma.

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Table 1. Geographic coordinates with known giant salvinia populations in Mississippi.

Water body	Nearest Town	County	Latitude	Longitude
Wedgeworth Creek	Hattiesburg	Forrest	31.265250	-89.216300
			31.261260	-89.214100
			31.261170	-89.214140
			31.260880	-89.214190
			31.260710	-89.214130
			31.260490	-89.213990
			31.259970	-89.213120
			31.259890	-89.213130
			31.259590	-89.212930
			31.259540	-89.212890
			31.259350	-89.212910
			31.265900	-89.216540
			31.259280	-89.212820
			31.258970	-89.212850
			31.259170	-89.213220
			31.259190	-89.213340
			31.266550	-89.216580
			31.266690	-89.216520
			31.261790	-89.214010
			31.261660	-89.213920
31.261390	-89.213960			
31.280420	-89.219920			

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Table 2. Geographic coordinates with known hydrilla populations in Mississippi and Alabama.

Water body	Nearest Town	County	Latitude	Longitude
Lake Columbus	Columbus	Lowndes	33.525927	-88.468830
			33.585655	-88.482965
			33.526020	-88.459012
			33.580955	-88.484098
Lake Aberdeen	Aberdeen	Monroe	33.845178	-88.525717
Lake Aliceville	Brooksville	Noxubee	33.228170	-88.285013
	Pickensville, AL	Pickens, AL	33.228195	-88.285087
			33.229185	-88.289010
			33.230947	-88.294428
Lake Gainesville	Gainesville	Greene, AL	33.526020	-88.459012
			32.924655	-88.187393
			32.923103	-88.185975
			32.918273	-88.201285
Ross Barnett	Canton	Rankin	32.508253	-89.929888
			32.486226	-89.957833
			32.529923	-89.905455
			32.516896	-89.915475
			32.561979	-89.866275
		Madison	32.523374	-89.929531
			32.548332	-89.898216
			32.518740	-89.944290
			32.532257	-89.918979
			32.517804	-89.947598
			32.521199	-89.940565

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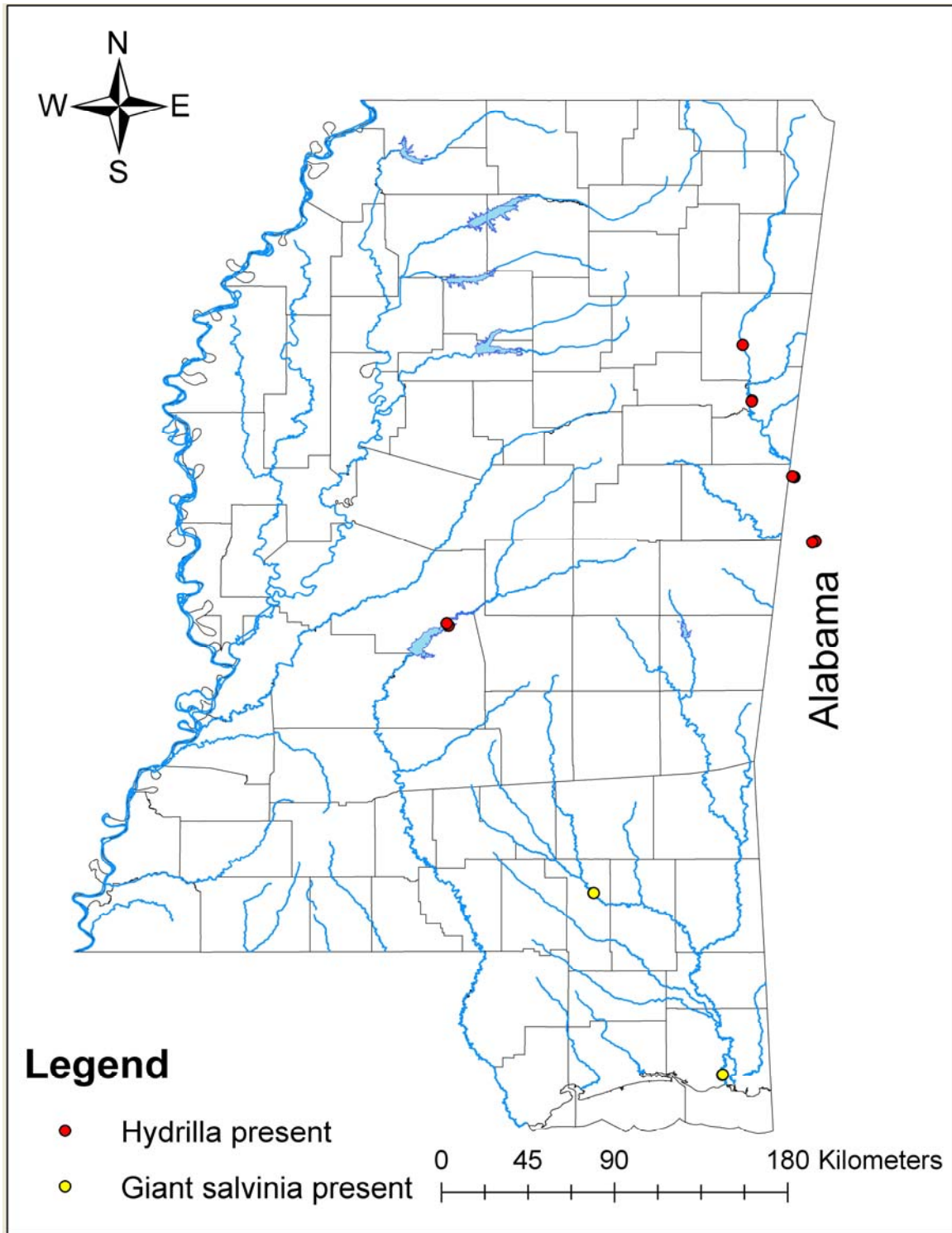


Figure 1. Distribution of giant salvinia and hydrilla in 2005.

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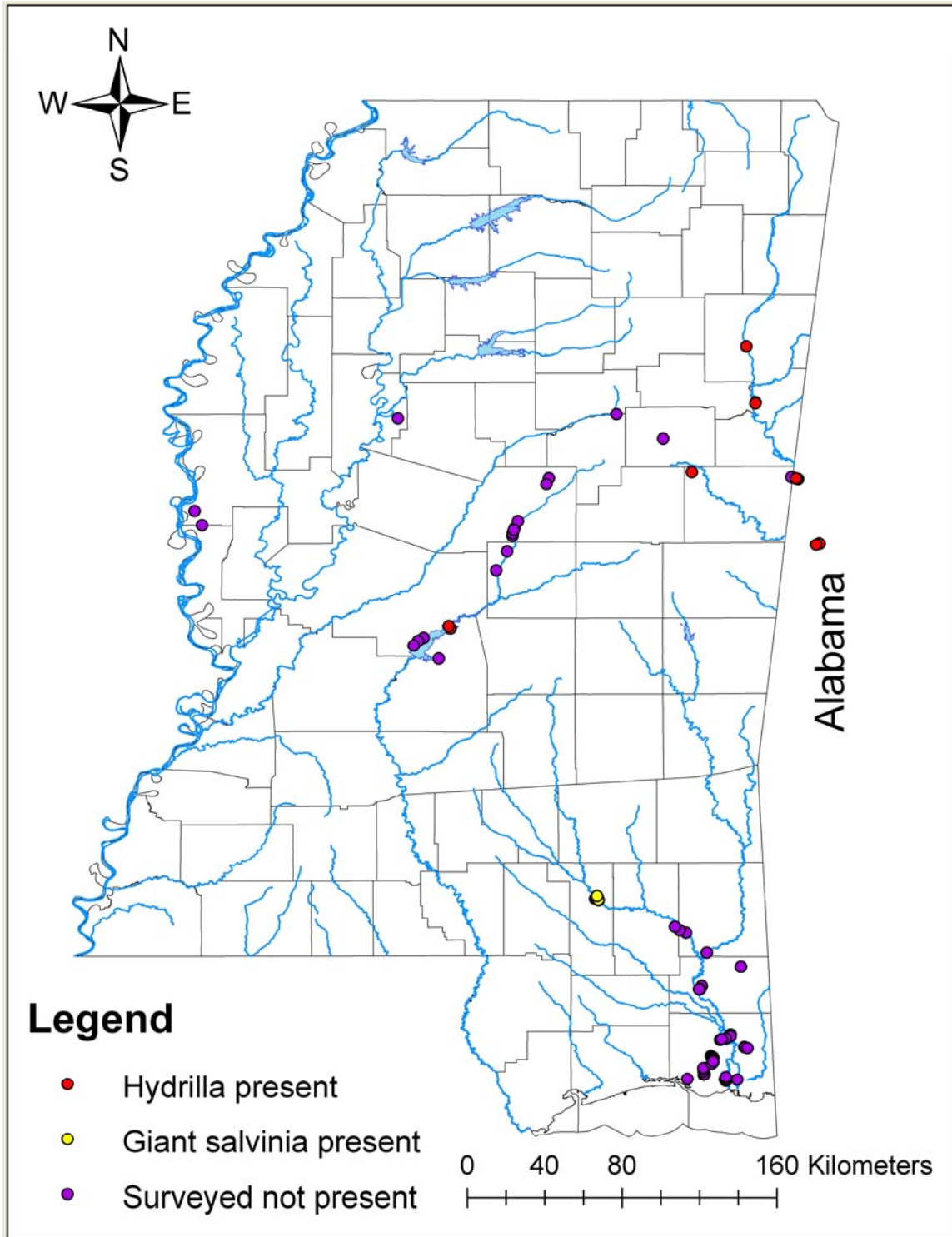


Figure 2. Distribution of giant salvinia and hydrilla in 2006.

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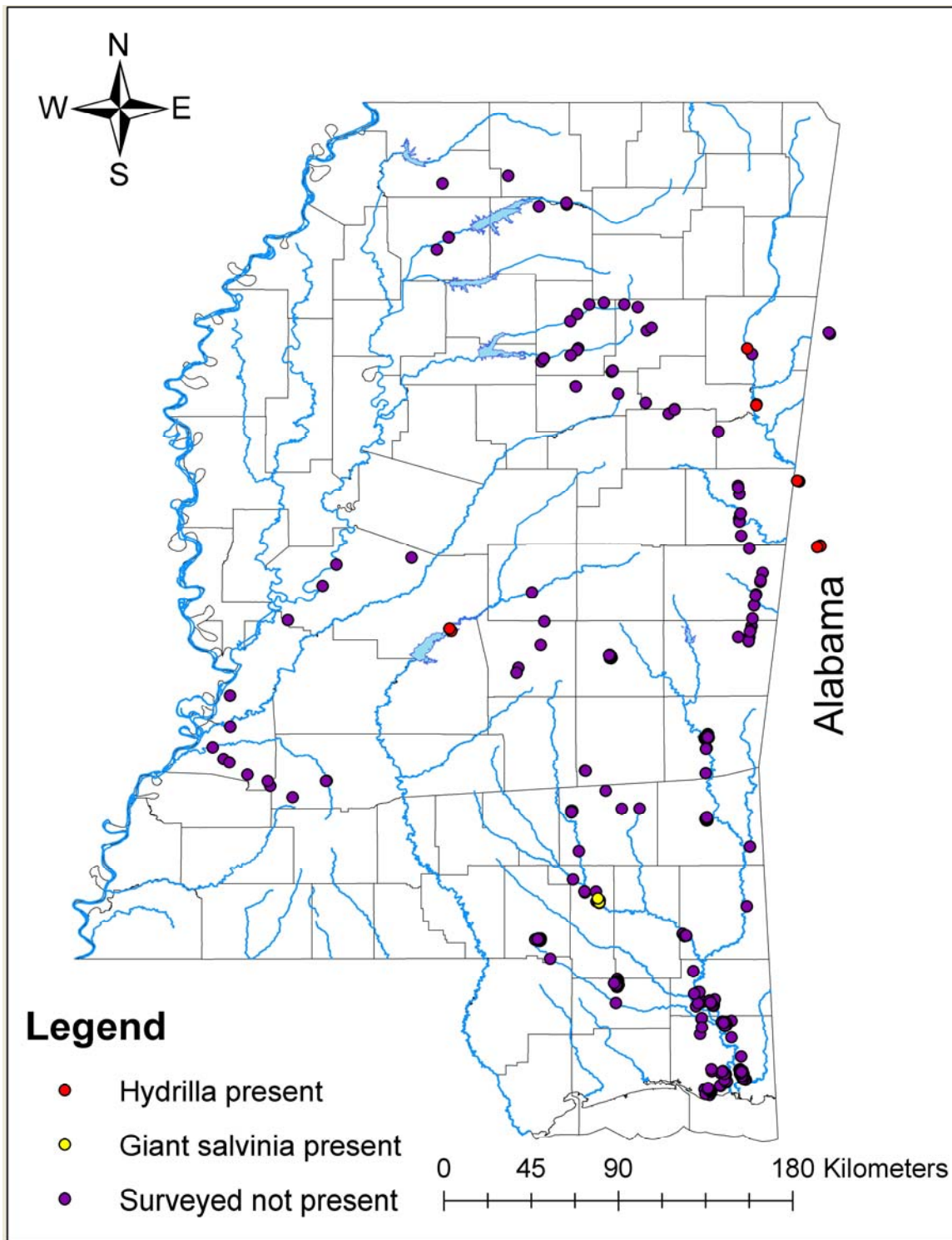


Figure 3. Distribution of giant salvinia and hydrilla in 2007.

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Figure 4. Mouth of Wedgeworth Creek, where giant salvinia was found in May 2007, as it drains into the Leaf River.