include submersed grassbeds, brackish marshes in the tidally influenced tributaries, and pine forests in the uplands and headwaters (see Appendix C).

Endangered and Threatened Species

Fifty-eight plants in Mobile County, mostly of bog and wetland habitats, are considered to be endangered, threatened, or of special concern (U.S. Department of the Interior, 1975; Freeman, et. al., 1979; O'Neil and Mettee, 1982; ADEM, 1994).

Forty-six animal species whose habitat is said to include the Dog River Watershed are listed as endangered, threatened, or of special concern. Five of these are crawfish, six are fish, four are amphibians, nine are reptiles, and twenty-two are birds, of which ten are resident species. Five mammals are threatened or of special concern (ADEM, 1994). In addition, the 1998 Locally Lead Watershed Assessment, by the Mobile County Soil and Water Conservation District, identified three underpopulated wildlife groups: deer, quail, and turkey.

Two of the five species of crawfish, *Cambarellus diminutus* and *Procamberus evermanni*, have been collected in the Watershed. One of the fish, the pigmy killifish (*Leptolucania omnatta*) is likely to occur in the Watershed. All four amphibians are known to inhabit the Dog River Watershed, though the flatwoods salamander (*Ambystoma cingulatum*) and the dusky gopher frog (*Rana areaolata sevosa*) have not been observed since 1922. The river frog (*Rana heckscheri*) and the greater siren (*Siren lacerata*) inhabit Mobile County. All nine reptile species identified may inhabit the Watershed: the gopher tortoise (*Gopherus polyphemus*), indigo snake (*Drumarchen corias couperi*), eastern diamondback rattlesnake (*Crotalus adamanteus*), black pine snake (*Pituophis melanoleucus*), pine woods snake (*Rhadinea flavilata*), Alabama red-bellied turtle (*Pseudomys alabamensis*), Florida green water snake (*Nerodia cyclopion floridiana*), Florida soft-shell turtle (*Trionyx ferox*), and the American alligator (*Alligator mississippiensis*), though this species has made a recovery in the Dog River Watershed area (ADEM, 1994).

Among the birds listed are the brown pelican (*Pelacanus occidentalis*), whose populations have also recovered within this area, bald eagle (*Haliaeetus leucocephalus*), swallow-tailed kite (*Elanoides forficatus*), sharp-shinned hawk (*Accipiter striatus*), Cooper's hawk (*Accipter cooperi*), and red-shouldered hawk (*Buteo lineatus*). Of the five mammals listed, three, the Florida yellow bat (*Lasiurus floridanus*), the southeastern myotis (*Myotis austroriparius austroriparius*), and the

Bayou grey squirrel (*Sciurus carolinensis fulignosus*) are the most likely to occur in the Dog River Watershed (ADEM, 1994).

Sediment Quality

A 1997 reconnaissance study of the Dog River Watershed by the USACE determined that the sediments of Robinson Bayou and the upper half of Dog River contain cadmium levels higher than the range to be expected in natural sediments. The entire Watershed contains elevated copper levels. However, the level of cadmium is below the level of concern, and the concentration of copper is not considered to be toxic to aquatic life.

All but one site in the basin sampled in the above study exceeded the lower threshold (35ppm) for lead, and two sites were measured above the upper threshold (110 ppm) with values at 114 ppm and 142 ppm. If persistent in sediments, lead levels exceeding the upper threshold value have been found to be harmful to amphipods (ADEM, 1994).

Water Quality

ADEM classifies the lower portion of the Dog River Watershed from its confluence with Halls Mill Creek to its mouth for use as swimming and other whole body water-contact sports. The upper portion of Dog River and the upper tributaries are given fish and wildlife classification.

The Dog River Watershed exhibits long-term problems with fecal coliform bacteria levels, turbidity, floating solids, and elevated nutrient concentrations. All of the problems are exacerbated after storm events. Also, there is a history of fish kills in Dog River. These occur in the late summer-early fall during natural periods of low dissolved oxygen and low flow that is intensified due to the drainage of Wragg Swamp and re-routing of the headwaters of Eslava Creek, contributing to increased flushing time, and therefore increasing hypoxia (ADEM, 1994).

Section 303(d) of the Clean Water Act of 1972 requires states to identify waters that do not meet their assigned water-use classifications and to establish priority to these bodies. After this list is completed and submitted to the EPA for approval, each state is required to develop total maximum daily loads (TMDLs) that are necessary to achieve the classifications. A TMDL is the sum of the allowable loads of a single

River, a bulk industrial gasses transfer company near Alligator Bayou, an air courier service, a soft drink bottling plant, a trucking service, two auto bumper plating works, three other manufacturing companies, and the Mobile Transit Authority. The auto bumper facilities are permitted to discharge process wastewater into Dog River Watershed tributaries. All others are permitted for the discharge of boiler blowdown and stormwater drainage and/or non-contact cooling water (ADEM, 1994). A gravel and sand mining facility formerly operated along Halls Mill Creek, but this facility has been closed for some time, and is currently being converted to small business facilities. There are, however, 154 sites with permits to discharge hazardous and solid wastes in the Watershed, according to the 1996 BASINS data from the EPA (Figure 8).

Forty-four percent of the Dog River Watershed, mostly the southern and southwestern portions, is in Mobile County jurisdiction. There is no master plan for the county; however, the City of Mobile Master Plan, adopted in 1995, extends 5 miles beyond city limits if there is no other incorporated municipality. There is little in the Master Plan directed at Dog River and its tributaries. The Plan proposes that undeveloped portions of the watershed at Rabbit Creek and Alligator Bayou not currently utilized for residence or commerce be designated for heavy industrial use. However, as these areas are in county jurisdiction, this proposal is only a recommendation for county policy (USACE, 1997).

F. Economic Development

Economic development in the Dog River Watershed focuses mainly on retail and residential activities: malls, shopping centers, office parks, sporting facilities, boat-related facilities, condominium and apartment complexes, and subdivisions for single-family dwellings. New development is occurring mainly in the southern and western portions of the watershed, more and more into county jurisdiction.

G. Environmental Resources

Living Resources

Areas of the Dog River have been closed to shellfishing by NOAA, as seen in Figure 9, due to many nonpoint sources of pollution, including stream-borne contaminants, urban runoff, waste-water treatment, combined sewer overflows, and potentially from industry and boating (EPA, 1996). A 1994 ADEM Watershed survey identified diverse plant and animal communities in the Dog River Watershed. These diverse

Figure 8. Hazardous and Solid Waste Sites (from EPA BASINS, 1996)

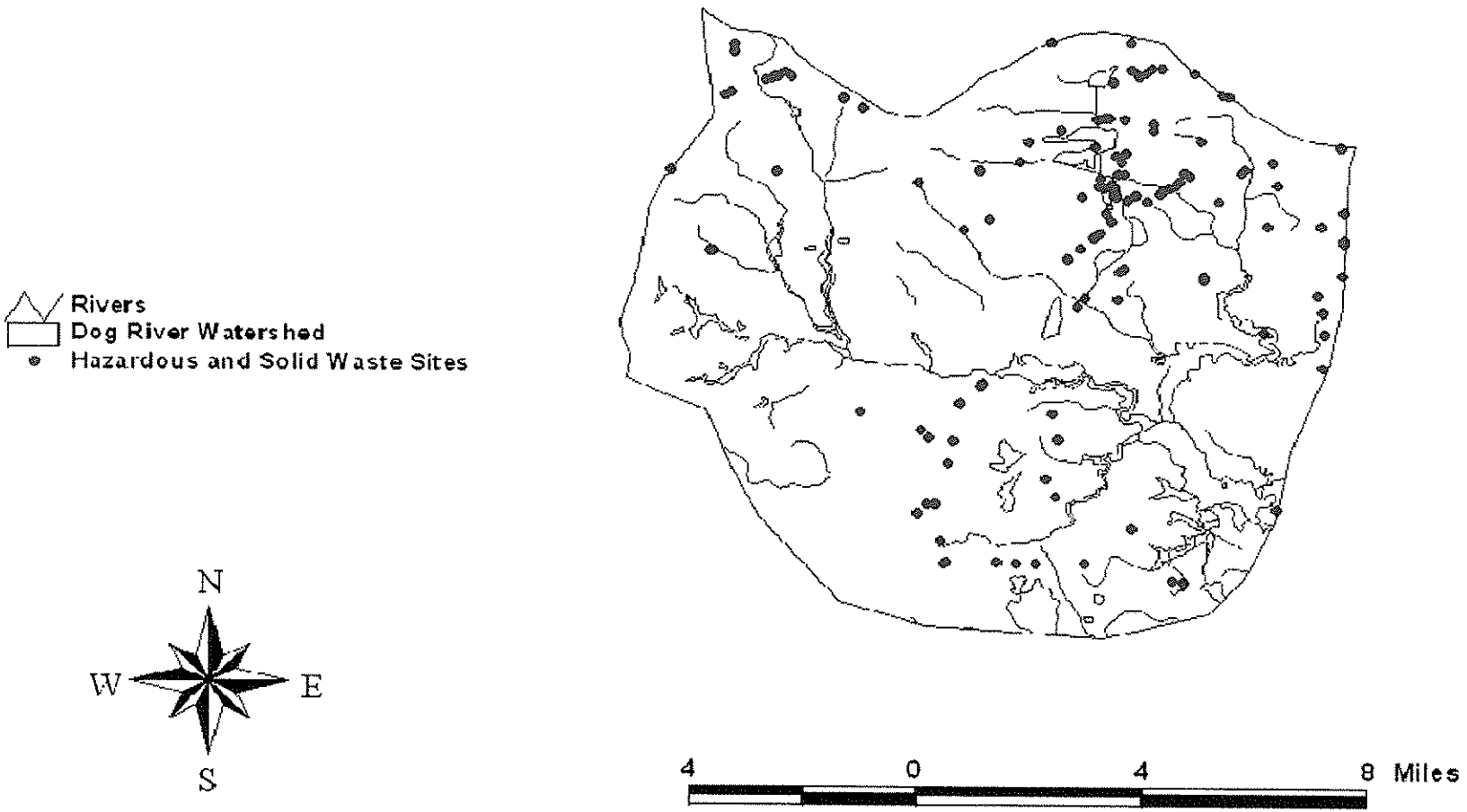
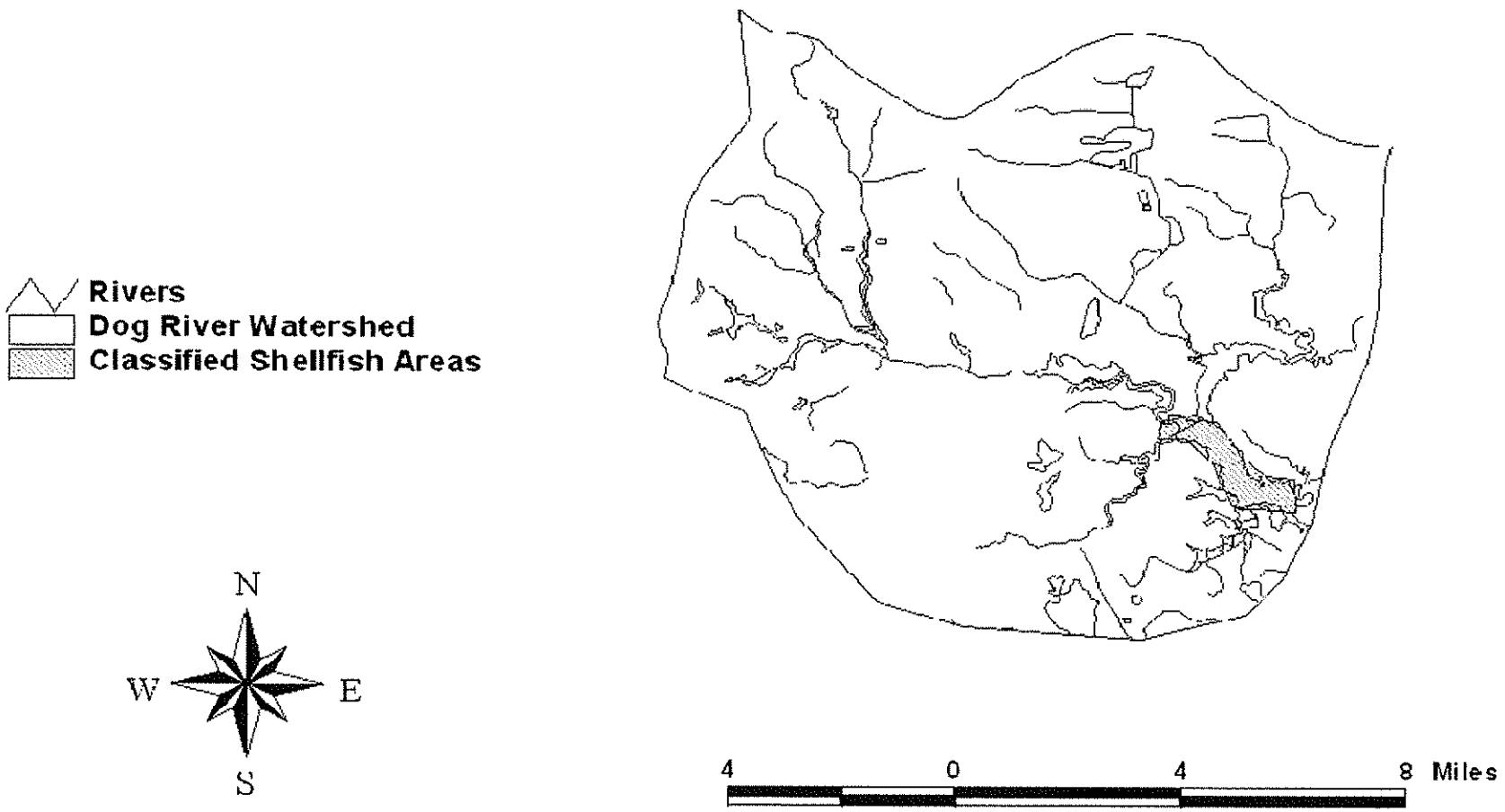


Figure 9. Classified Shellfish Areas (from EPA BASINS, 1996)



pollutant from all contributing point and non-point sources. The calculation must include a margin of safety to ensure that the waterbody can be used for the purposes designated by the State (EPA, 1991). Two segments of the Dog River Watershed are included on the 1998 Section 303(d) List for Alabama submitted to the EPA by ADEM (Table 2). Three miles of Rabbit Creek, from Alabama Highway 163 to its confluence with Dog River, whose use is classified as fish and wildlife, is listed for organic enrichment/dissolved oxygen problems and for pathogens, caused by urban runoff/storm sewers, and onsite wastewater systems (septic tanks). Four miles of Dog River upstream from its mouth at Mobile Bay, classified as fish and wildlife and swimming, is listed for non-attainment of its use classifications due to pH and organic enrichment/dissolved oxygen due to land development, urban runoff/storm sewers, and onsite wastewater systems. The draft TMDL date for both Rabbit Creek and Dog River is June 1, 2005 and the final date is September 5, 2005 (EPA, 1999; ADEM, 1999).

Currently citizen volunteers with the Dog River Clearwater Revival (DRCR), under the Alabama Water Watch program, monitor 19 sites in the Watershed at least bi-weekly (Figure 10). Citizens monitor water temperature, pH, dissolved oxygen, turbidity, alkalinity, and hardness. *E. coli* monitoring is being conducted at 5 sites. Volunteers are certified according to the EPA-approved *Alabama Water Watch Quality Assurance/Quality Control Plan* for both basic and bacteriological parameters.

III. General Description of Sub-basins

Eslava Creek

The Eslava Creek area is urban, with numerous storm drains and culverts leading to the extensively channelized creek (Figure 11). The highly developed area contains large impervious expanses, though the remaining natural vegetation is of a mixed pine-oak forest (ADEM, 1994).

The lower portion of Eslava Creek is channelized, but with more naturally vegetated banks. The development in this area is mostly residential or small retail commercial, and is considered to be of older construction, being built prior to 1960.

The upper portion of the Creek has riprap or concrete revetment banks. This region of Eslava Creek once contained extensive wetlands known as Wragg Swamp, but was drained in the 1950's and 1960's for construction of real estate and of Interstate 65.