U.S. Fish & Wildlife Service

Small-anthered bittercress

(Cardamine micranthera)

The Federal Endangered Species Act

The Endangered Species Act of 1973 (Act) recognizes that many of our nations valuable plant and animal resources have been lost and that other species are close to extinction. The Act provides a means to help preserve these species and their habitats for future generations.

Description, biology, and habitat

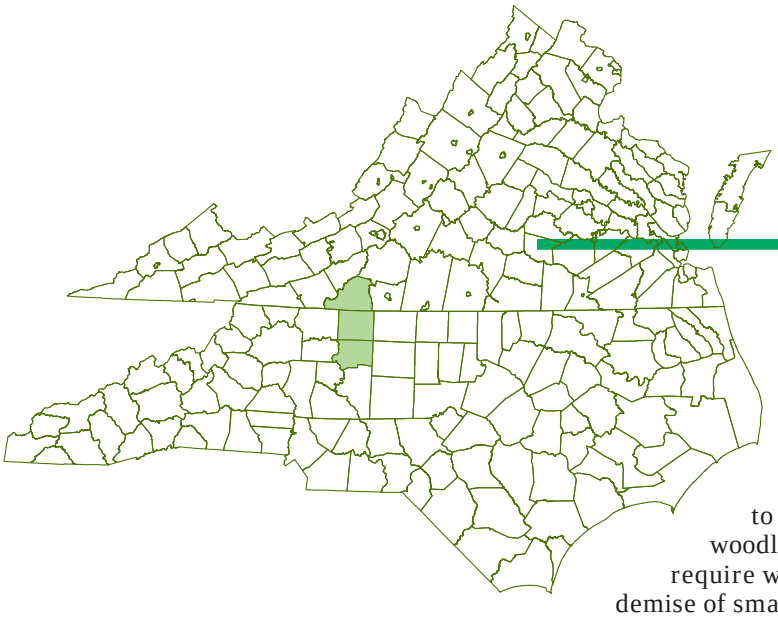
Historically, the small-anthered bittercress was known to exist in small streambank seepage areas, adjacent sandbars, and stream edges in the Dan River watershed in Stokes and Forsyth Counties, North Carolina, and Patrick County, Virginia.

First discovered in 1939, it was thought to be extinct by the early 1960's. However, in 1985 the species was seen again in Stokes County along Little Peters Creek, a tributary to the Dan River. The only known habitat in Forsyth County was converted into a cow pasture, and the species has never been relocated in this county. Following its rediscovery, the species was state-listed as endangered in North Carolina and Virginia. It was federally-listed as endangered on September 21, 1989. As of 2006, the global range of this species consisted of approximately 36 sites, all of which occur along tributaries to the Dan River in North Carolina and Virginia.

This rare perennial herb is a member of the mustard or cress family, *Brassicaceae*. It's one of thirteen species in the genus *Cardamine* that are native to North Carolina and Virginia. It's erect and slender, with fibrous roots and typically one, but occasionally several, simple or branched stem(s) growing 20 to 40 centimeters tall. Basal leaves have one or two pairs of small lateral lobes, while stem leaves are alternate and mostly unlobed. The best time to find it is in April to May when it flowers and fruits. The flowers consist of four white petals, six stamens, and small, rounded anthers. The fruit contains brown seeds that are approximately one millimeter long. It is distinguished from its common relative, *Cardamine rotundifolia*, by its smaller flowers and fruits that are only half as long as those of *C. rotundifolia*.

Why is the small-anthered bittercress so rare?

All known populations of small-anthered bittercress occur on privately-owned land. The surviving populations range in size from fewer than a dozen plants to over 1,000 individuals. As is the case with many aquatic and riparian species, the majority of small-anthered bittercress populations have been negatively impacted and continue to be threatened by impoundments, channelization, and residential, industrial, and agricultural development. The close proximity to agricultural lands and the loss of adequate stream buffer zones make the plants vulnerable to herbicides, erosion, and siltation, as well as from trampling by cattle. Logging in close proximity can also lead to erosion and siltation problems. Much of the seep habitat with which this species was historically associated is now gone, and most of the surviving plants exist in the streambed on small sandbars, making them especially vulnerable to flooding that can scour the streambanks and wash away the few remaining plants. Invasive, exotic species, such as Japanese honeysuckle (*Lonicera japonica*) have taken over many areas of suitable habitat for this species. Germination of seeds in cultivation is being tested to enhance existing populations and for possible reintroduction to historical



sites, however attempts to cultivate small-anthered bittercress have shown that cuttings will not flower and the plants do not live long enough to flower more than once in containers. More information is needed to determine if rates of seed production – and seedling survival – are adequate to maintain the size of the remaining populations in the wild.

Why should we be concerned about the loss of species?

All life on Earth is interconnected, including humans. We depend on the diversity of plant and animal life for many resources, including food, many important medicines, and the ecological functions each species performs in its special niche. Every time a species becomes extinct, we lose the known and unknown benefits that particular species provides. Over half of the medicines in use today come from plants and animals, but only a small fraction of species have been tested to determine their potential medicinal value. When a species disappears, our opportunities to discover new cures and treatments become more limited, and important discoveries may be lost forever. The current population numbers of small-anthered bittercress are not known exactly, but field studies performed in 1996 found only nine small populations in Stokes County, N.C., and 1999 studies found only thirteen populations in Patrick County, VA.

Endangered species are indicators of the health of our environment. They serve as an early warning system that one or more basic elements, such as air, land, and water in our environment are becoming compromised. The small-anthered bittercress cannot survive without the habitat of small, protected streambeds. These areas are also home to many other woodland species that require wet, boggy soils. The demise of small-anthered bittercress indicates that many other species may also be on the verge of decline.

Although extinction is a natural process, the current extinction rates are approximately one thousand times greater than the normal rate. Before humans began to make extraordinary impacts on the environment, extinction occurred in balance with speciation, the process through which new species develop to take the place of species that disappear. Almost all extinctions in recent history have been due to direct or indirect environmental changes caused by humans. Our modern day impacts cause changes to occur too rapidly and to such a greater extent than natural changes would occur that species do not have enough time to adapt to their changing environment.

What you can do to help

- Establish and maintain forested streamside buffers. Several federal, state, and private programs are available to assist landowners, both technically and financially, with restoring and protecting streamside buffers and eroding streams.
- Implement and maintain measures such as Best Management Practices for controlling erosion and storm water during and after land-clearing and disturbance activities
- Be careful with the use and disposal of fertilizers, pesticides, and other chemicals. Remember, what you put on your land or dump down the drain may eventually wind up in nearby waters.
- Support local, state, and national clean water legislation and wetland protection efforts.
- Report illegal dumping activities and erosion and sedimentation problems. These activities do affect you.
- Recycle as much as you can. As landfills become full, new ones are often placed in uninhabited areas, causing the destruction of hundreds of acres of wild habitat.

Wild lands and the plants and animal life that inhabit unique natural places are now dependent on us for survival. We can enjoy and benefit from these natural places with their diversity of life. With our help, they will be there for future generations.

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