



Cumberland Rosemary Status 2018

Obed Wild and Scenic River (OBRI)
Big South Fork National River and Recreation Area (BISO)

Importance: A Threatened Species

Cumberland rosemary (*Conradina verticillata*) is a Federally-listed Threatened species endemic to the upper Cumberland Plateau in Tennessee and Kentucky. BISO and OBRI contain 89% of all the remaining populations of this imperiled species, and OBRI contains almost 75% of the total, as well as the largest known population remaining in existence. The Obed Wild and Scenic River is by far the most significant remaining stronghold for this species. Cumberland rosemary, like other plant species found in the same open cobble bar/ riverscours prairie habitat, thrives in part due to the regular occurrence of massive, scouring floods. Regular floods eliminate competing woody species that would otherwise shade out and eliminate these unique plants, which rely on grassy openings. Populations of this rare species are threatened by water pollution, changes in river flow patterns (especially the reduction in floods associated with record drought conditions experienced in recent years), and non-native invasive plants.

Objectives

Determine current status and track long-term trends in abundance, cover, and size class distribution within selected park populations.



Figure 1. Cumberland rosemary (*Conradina verticillata*).

Status and Trends

Cumberland rosemary populations in the parks have been monitored since 2001, with NPS and State (TN and KY) personnel conducting complete censuses at a limited number of accessible populations by counting and measuring all plants at those sites. Data are also collected on presence and cover of non-native invasive plant species at each site. Many previously unknown populations of rosemary were discovered during an effort by NPS crews to map cobble bars between 2005 & 2010. Prior to this project, the location and extent of most of these populations were unknown due to their inaccessibility in the bottom of deep river gorges lined by sheer cliffs, where many can only be reached by boat when flows are high.

NPS staff conducted rosemary monitoring at seventeen sites in March 2018, eight at BISO & nine at OBRI. While vegetation conditions may have been slightly better for rosemary monitoring in February, high water levels caused delays. Compiling all data collected since 2001 for eight rosemary populations at BISO and ten populations at OBRI, it appears that three of the BISO populations are stable to slightly increasing in number of plants, three are stable to slightly decreasing, one has variable counts with no clear trend, and one is decreasing dramatically and may soon be extirpated (one historical population has already been extirpated). Total cover appears to be increasing at two sites, relatively stable at three sites, and decreasing at two sites; one site does not exhibit a clear trend. At OBRI, count data collected beginning in 2007 suggest that two populations increased noticeably and then stabilized over the last few years, six are relatively stable, one decreased noticeably and then stabilized over the last few years, & one has been extirpated (although it only comprised a single plant). Total cover is increasing at one site, relatively stable at three sites, decreasing at three sites, and three sites do not exhibit a clear trend. Collection of total cover data only began recently for most populations, so it is not yet possible to determine trends for this measure at all sites. Monitoring is planned for the same seventeen sites in February or March of 2019.

In the future, APHN staff may repeat the rosemary mapping project to look for population-level changes in the distribution of this rare plant.

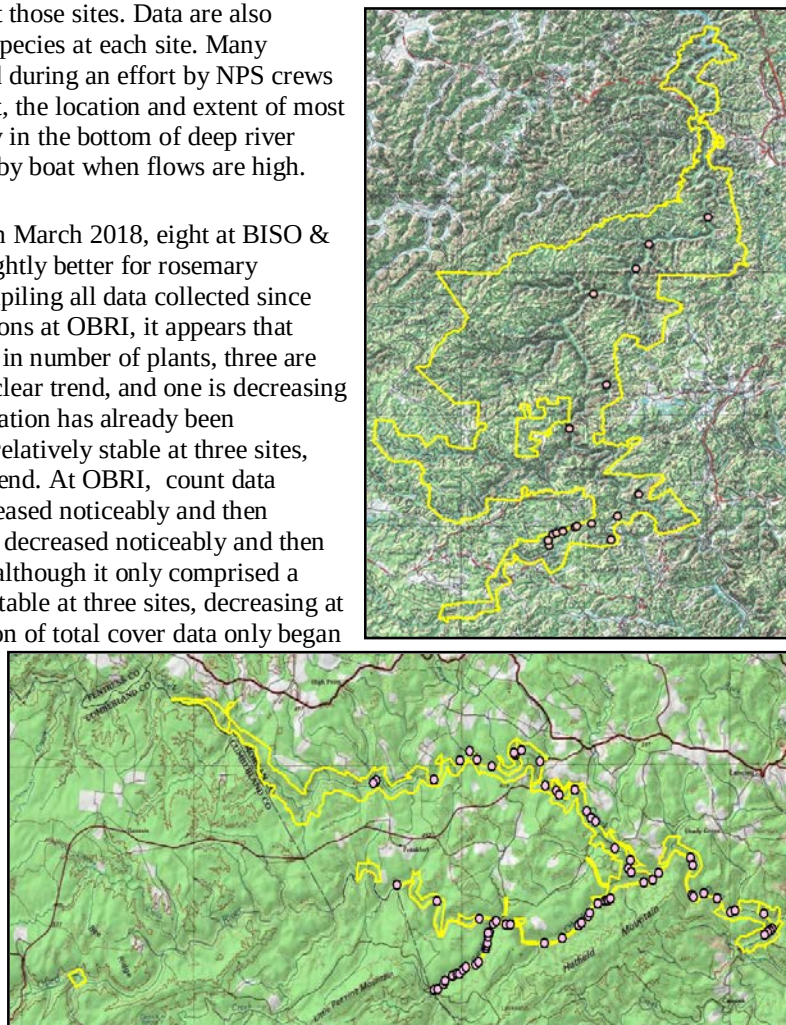


Figure 2. Distribution of Cumberland rosemary within BISO (top, 17 mapped populations) and OBRI (bottom, 79 mapped populations).

Agency Collaboration

Once again, park personnel provided valuable field assistance, with two BISO/OBRI Resource Management staff & one volunteer participating.

The NPS protocol for rosemary monitoring is the same as that being used by the States of Tennessee and Kentucky, which should permit integration of data across the range of the species. However, some past monitoring has been conducted during the growing season, when tall grasses and other dense vegetation can obscure the low-growing rosemary, making detection difficult and calling into question the accuracy of growing-season results (see Figure 3). NPS staff now conduct monitoring in winter, when other vegetation is less of a hindrance to accurate counts or the evergreen rosemary. We hope to work more closely with the US Fish & Wildlife Service and state agencies in TN & KY on rosemary monitoring in 2019 and beyond. Joint monitoring efforts should help ensure consistent data collection methods & thereby improve analyses using data from multiple agencies.

On June 30, 2017, the US Fish & Wildlife Service (FWS) initiated a five-year status review of 23 Threatened & Endangered species in the Southeast, including Cumberland rosemary (see Figure 4). Geoff Call, the USFWS biologist responsible for the five-year review of this species, participated in monitoring at one site in 2017. APHN staff contributed data for the review, which is expected to be published within the next year.



Figure 3. Rosemary monitoring site at BISO in September (top) & March (bottom).

DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

[FWS-R4-ES-2017-N024;
FXES1113090000C2-178-FF09E32000]

Endangered and Threatened Wildlife and Plants; 5-Year Status Reviews of 23 Southeastern Species

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Notice of initiation of reviews; request for information.

SUMMARY: We, the U.S. Fish and Wildlife Service (Service), are initiating 5-year status reviews of 23 species under the Endangered Species Act of 1973, as amended (Act). We conduct these reviews to ensure that the classification of species as threatened or endangered on the Lists of Endangered and Threatened Wildlife and Plants is accurate. A 5-year review is an assessment of the best scientific and commercial data available at the time of the review. Therefore, we are requesting submission of information that has become available since the last review of each of these species.

Figure 4. Introduction to the Notice of Initiation of 5-year Review in the Federal Register.

Cumberland rosemary monitoring data, compiled from all sources OBRI – 2007-2018 and BISO – 2001-2018

(Provisional data. Graphs are shown at different scales.)

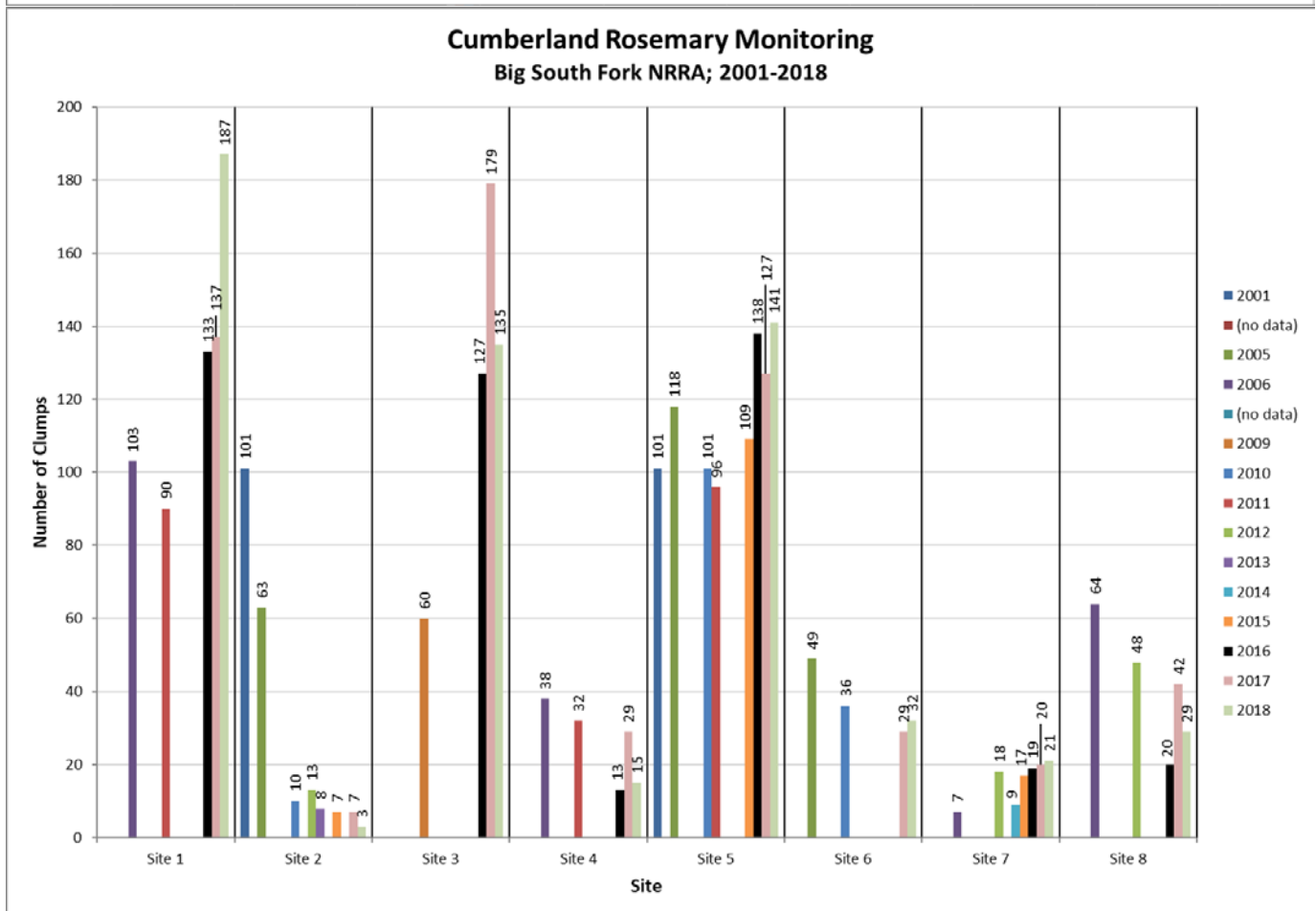
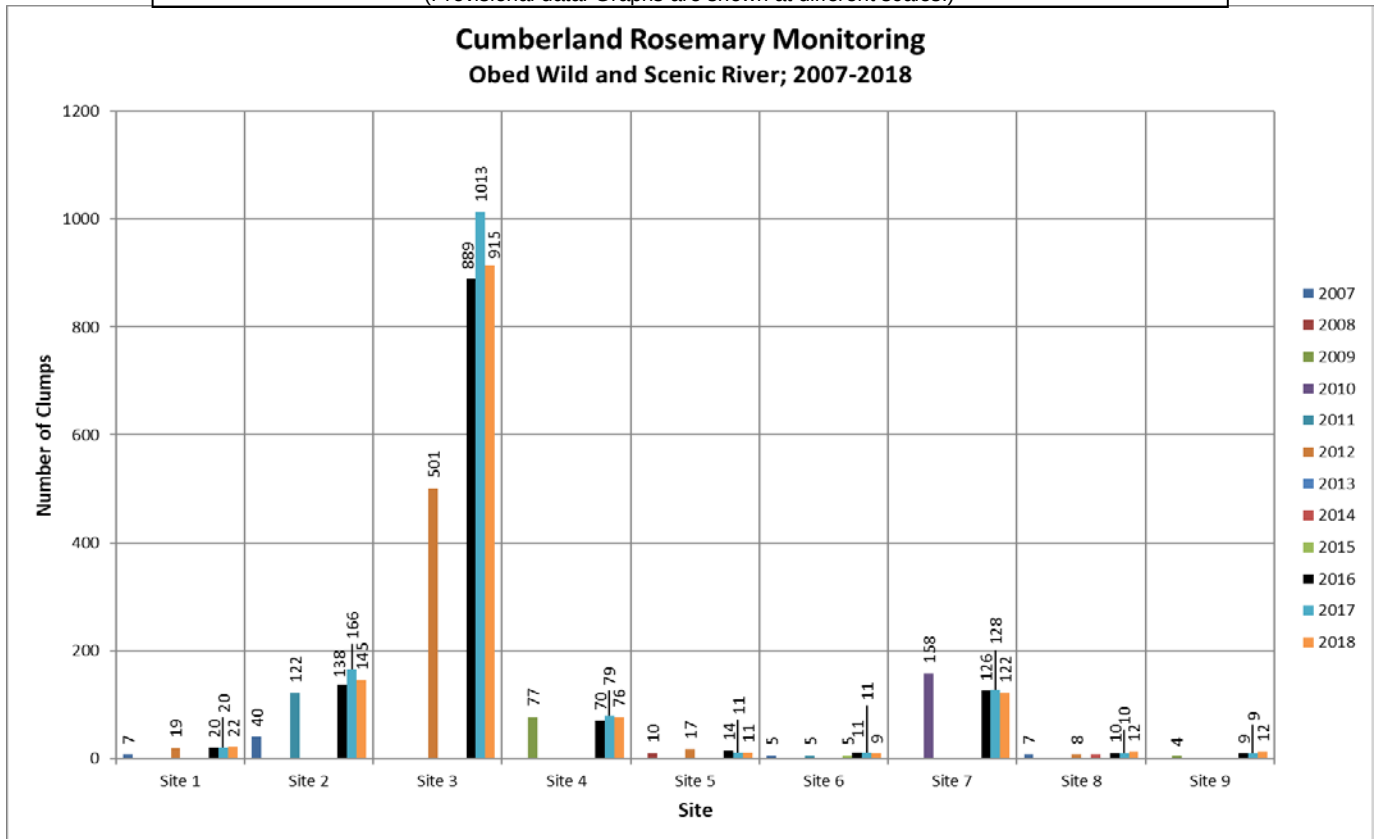


Figure 5. Rosemary count data from OBRI (top) & BISO (bottom). The SLRO site at OBRI is no longer being monitored for rosemary and has been dropped from the graph to save space.

Cumberland Rosemary - Overall Assessment of Trends and Data Quality 2001-2018

(Provisional data)

Park	Measure	Condition Status/Trend*	Resource Condition Comments & Interpretation
BISO (8 extant sites)	Number of plants		3 populations stable to slightly increasing, 3 stable to slightly decreasing, 1 decreasing dramatically, 1 with counts highly variable [1 historical population extirpated]
	Overall cover of rosemary		2 populations increasing, 3 relatively stable, 2 decreasing, 1 variable with no clear trend (4 sites have cover data for only the last 3 years)
OBRI (9 extant sites)	Number of plants		6 populations relatively stable, 2 increased noticeably then apparently stable over the last 3 years, 1 decreased noticeably then apparently stable the last 3 years, 1 extirpated
	Overall cover of rosemary		1 population increasing, 3 relatively stable, 3 decreasing, 1 decreased noticeably then apparently stable over the last 3 years, 1 variable with no clear trend (2 sites have cover data for only the last 3 years)

*General trends, not necessarily statistically significant.

Key Points for 2018

- 2018 was the third consecutive year in which winter counts & cover measurements were completed at a majority of sites. This more consistent monitoring should provide a better understanding of population conditions & trends.
- Once again, BISO/OBRI Resource Management personnel assisted APHN staff with data collection.
- Several BISO populations appear to be declining, one of which may soon be extirpated if the trend continues.
- The USFWS is wrapping up a five-year status review for this species.
- APHN video footage of Cumberland rosemary appears in the award-winning 2016 BISO park movie, *Generations*.

Management Applications

- Provide critical status information on this protected species to park management
- Identify sites in need of control efforts for invasive exotic plants
- Provide feedback on the timing and success of park management and restoration activities
- Support park resource protection planning and land health reporting efforts



Figure 6. Winter rosemary monitoring at OBRI in March, 2018.

Contact Information

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