



Invasive Exotic Plant Monitoring

Importance

Invasive exotic plants are one of the most significant threats to natural resources in the national parks today. Exotic plants are a concern because they are able to reproduce prolifically, rapidly colonize new areas, displace native species, and alter ecosystem processes across multiple scales. If invasive exotic plants are discovered while their populations are still small, control efforts are likely to cost less and achieve higher success rates than after a species has become more widespread. Therefore, early detection of exotic plants is critical.

Long-term Monitoring

In order to provide early warning of new exotic threats, the Northern Colorado Plateau Network (NCPN) focuses its invasive-plant monitoring efforts on areas where invasive exotics are likely to first establish.

The network is implementing a multi-pronged approach to the early detection of exotic plants. First, NCPN or park staff experienced with a wide range of exotics survey established monitoring routes on a rotational basis to maximize both efficiency and ground coverage. Along those routes, staff establish plots that can be quickly surveyed for data that will enable us to make trend estimates over time. In addition, NCPN staff may dedicate approximately 25% of their time to inventories of areas that are of high management concern. Finally, the network has designed “monitoring lite,” a method by which park staff or volunteers with less knowledge of invasive species may collect data for use in NCPN databases and reporting.

The objectives of NCPN invasive plant monitoring are to:

1. Detect incipient populations and new introductions of invasive plant species; and
2. Determine status and trends of selected populations of invasive plants of management significance.

Management Applications

Information gathered from this monitoring will support a long-term, ecosystem-wide strategy for controlling invasive plant species and provide park managers with access to systematically collected information that enables them to be well-informed about the status of ecosystems and prioritize dedication of limited resources to invasive-plant control efforts.

Status and Trends

NCPN invasive exotic plant (IEP) monitoring began in 2008, with a pilot field season at Golden Spike NHS and Fossil Butte NM. Since then, monitoring has been implemented at Capi-



Steve Dewey, Utah State University, Bugwood.org

Tamarisk is a persistent concern in NCPN parks.

tol Reef NP, Colorado NM, and Dinosaur NM. In 2010, the network revisited Fossil Butte NM, Golden Spike NHS, and Capitol Reef NP, and implemented full-scale monitoring at Dinosaur NM. Reports on all of these seasons can be found at the network’s web site. In addition, invasive plant inventories were conducted at Black Canyon of the Gunnison NP and Curecanti NRA in 2010 through partners at Utah State University. In 2011, network staff re-sampled all monitoring routes at Colorado NM, expanded monitoring at Capitol Reef NP, completed monitoring of the entire river corridor at Dinosaur NM, and implemented monitoring at Black Canyon of the Gunnison NP and Curecanti NRA.

In 2012, the NCPN will sample in the Cathedral Valley at Capitol Reef NP, re-visit all monitoring routes at Fossil Butte NM and Golden Spike NHS, return to Black Canyon of the Gunnison NP and Curecanti NRA for a third year, and implement monitoring at Zion NP. At the end of the 2012 field season, invasives monitoring will have been implemented at all parks scheduled to receive it. The NCPN invasive plant monitoring protocol was submitted for peer review in December 2010.

Contact

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Network park units where invasive exotic plants are monitored

Black Canyon of the Gunnison NP	Dinosaur NM
Capitol Reef NP	Fossil Butte NM
Colorado NM	Golden Spike NHS
Curecanti NRA	Zion NP

NP = National Park; NM = National Monument;
NRA = National Recreation Area; NHS = National Historic Site

Invasive Plant Monitoring Informs Management

Invasive exotic plant (IEP) species are one of the biggest threats to natural ecosystem integrity and biodiversity, and controlling them is a high priority for the National Park Service. Through invasive-plant control efforts, park staff have succeeded in reducing tamarisk (*Tamarix chinensis*), tree-of-heaven (*Ailanthus altissima*), and Russian knapweed (*Centaurea repens*) along Highway 24 and Pleasant Creek at Capitol Reef NP; Canada thistle (*Cirsium arvense*) and black henbane (*Hyoscyamus niger*) on monitoring routes along the Main Park Road and Chicken Creek at Fossil Butte NM; and white horehound (*Marrubium vulgare*) at Golden Spike NHS. However, priority exotic plants have increased along monitoring routes in number and size of infestations at Fossil Butte NM in most other areas where control efforts have not taken place, demonstrating the importance of ongoing management. Many IEPs are present at these parks in small, localized invasions that have a promising chance of successful management control and eradication. Staff from both the parks and Exotic Plant Management Teams use NCPN monitoring reports to guide control efforts.

Results for 2010

AT CAPITOL REEF NP, park staff detected eight IEP species on monitoring routes and transects along 19.4 kilometers of Utah State Highway 24 and Pleasant Creek. Of the invasive species considered Priority 1 for the park, tamarisk and Russian olive (*Elaeagnus angustifolia*) were the most common along Highway 24, while tamarisk and alfalfa (*Medicago sativa*) were the most common along Pleasant Creek.

AT DINOSAUR NM, NCPN staff detected 13 Priority 1 IEP species and 5 additional IEP species on monitoring routes and quadrats along 234 kilometers (383 hectares) of the Green and Yampa rivers. Almost the entire riparian corridor along the Yampa and upper Green rivers, and limited portions the lower Green River, was monitored in 2010. Tamarisk, broadleaf pepperwort (*Lepidium latifolium*), and yellow sweet-clover (*Melilotus officinalis*) were widespread along all three monitored sections of the river corridor. Canada thistle was widespread on the upper Green River, while Russian olive was widespread along the westernmost portion of the lower Green River.

AT FOSSIL BUTTE NM, NCPN staff detected 21 IEP species on monitoring routes and quadrats. Of these, 11 were Priority 1 species for the park that have been consistently recorded each year. No new Priority 1 species were detected along monitoring routes in 2010. Generally, the further a route was from areas of high visitation, the fewer IEPs were detected on it. Efforts should be made to ensure that the area around Fossil Butte, which is largely free of Priority 1 IEPs, is maintained. This area had no infestations in 2009, but had two in 2010.

AT GOLDEN SPIKE NHS, 25 IEP species were detected on monitoring routes and plots that covered all major roads, trails, and riparian areas. IEPs were widespread, with at least one IEP present on every monitoring route and monitoring transect. Four taxa may be beyond management control: crested wheatgrass (*Agropyron cristatum*), cheatgrass (*Bromus tectorum*), field bindweed (*Convolvulus arvensis*), and redstem storksbill (*Erodium cicutarium*). Infestation rates in 2010 were similar to rates estimated in 2008.

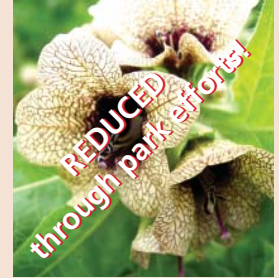
WANTED

OUT OF NCPN PARKS!



Tamarisk

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Black henbane

(Jan Samanek; State Phytosanitary Administration; Bugwood.org)



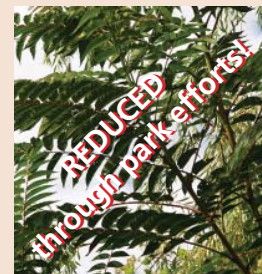
Canada thistle

(Steve Dewey, Utah State University; Bugwood.org)



Russian knapweed

(Steve Dewey, Utah State University; Bugwood.org)



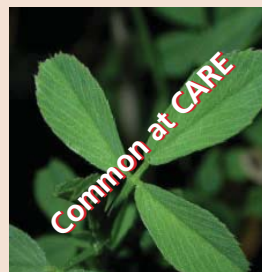
Tree-of-heaven

(Jan Samanek, State Phytosanitary Administration; Bugwood.org)



White horehound

(©Patrick J. Alexander)



Alfalfa

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Russian olive

(USDA-NRCS/J. S. Peterson)