Invasive Exotic Plant Monitoring at Golden Spike National Historical Park, 2021



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Rush skeletonweed (*Chondrilla juncea*).

Invasive exotic plants are one of the most significant threats to natural resources in the national parks today. To provide early warning of weed invasions, the Northern Colorado Plateau Network (NCPN) monitors for these species in areas where they are likely to first establish: along roads, trails, and waterways.

What Are Invasive Exotic Plants?

Invasive exotic plants (IEPs) are species whose introduction to an environment "does or is likely to cause economic or environmental harm or harm to human health." In national parks, IEPs can alter ecosystems at multiple scales—threatening wildlife, natural landscapes, and recreational opportunities.

IEPs are able to reproduce prolifically, rapidly colonize new areas, and displace native species. Invasive plants fill different ecological roles than the native plants they replace, leaving gaps in the system. In the absence of the native plants, the needs of species that depended on the native vegetation may go unmet, potentially creating a cascade of ecological effects.

The good news is that if discovered before they have a chance to take hold, IEP populations can be eradicated from parks. Small populations are cheaper and easier to control than large populations. Therefore, early detection is critical.

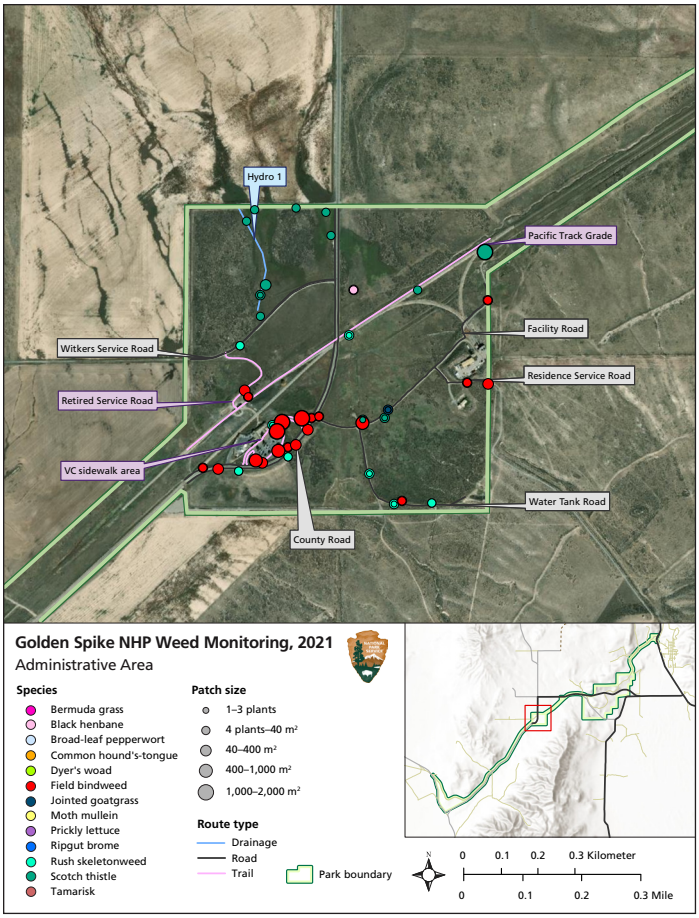
What Can Be Done?

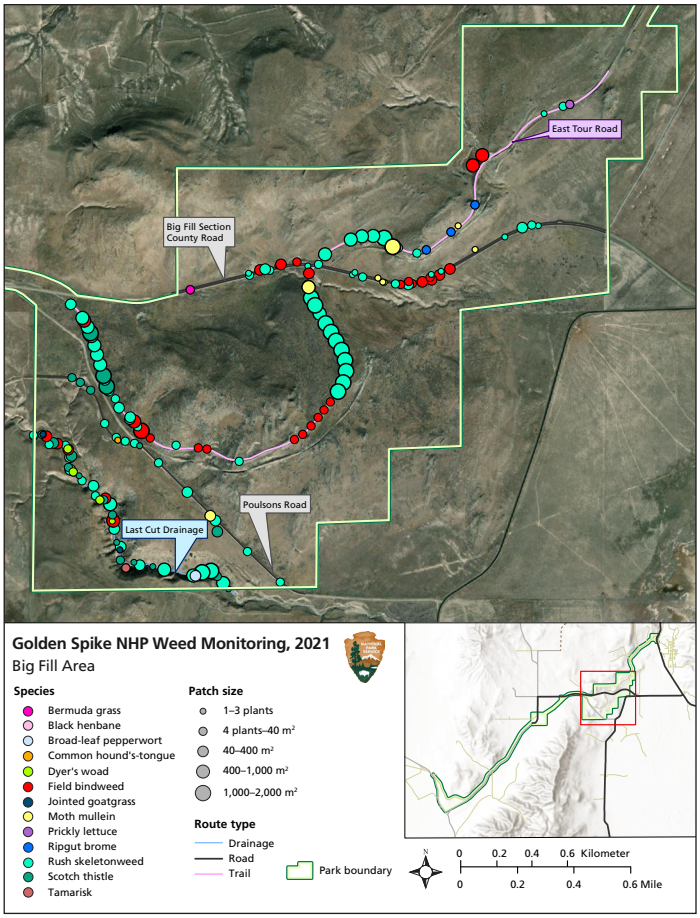
To help park managers identify IEPs and prioritize control efforts, the Northern Colorado Plateau Network (NCPN) monitors invasive exotic plants in eight National Park Service units. First, network and park staff create a list of priority IEPs for each park. Then, on a rotating schedule, a field crew visually surveys for those IEPs along established monitoring routes. Along the routes, they stop and set up plots for additional data collection. The plot data allow network ecologists to estimate trends over time.

Recent Monitoring

During monitoring on June 24–25, 2021, a total of six priority IEP species were detected during monitoring at Golden Spike National Historical Park. A total of 191 priority IEP patches were detected along 20 kilometers (12.4 miles) of 13 monitoring routes that covered all major roads, trails, and riparian areas. Three additional IEP species were recorded only in transects.

- Rush skeletonweed (*Chondrilla juncea*) was the most prevalent priority species, representing 46% of all recorded patches.
- Field bindweed (*Convolvulus arvensis*) and Scotch thistle (*Onopordum acanthium*) constituted most other patches.
- Cheatgrass (*Bromus tectorum*), crested wheatgrass (*Agropyron cristatum*), and tumble mustard (*Sisymbrium altissimum*) were present in 84%, 45%, and 36% of all transects, respectively.





Invasive exotic plant patches detected along monitoring routes at Golden Spike National Historical Park, June 24–25, 2021.

- IEPs were most dense along the Hydro 1 and Last Cut drainages, followed by the Residence Service Road, East Tour Road, and Visitor Center Sidewalk Area (see maps).
- Broad-leaf pepperwort (*Lepidium latifolium*), dyer's woad (*Isatis tinctoria*), and moth mullein (*Verbascum blattaria*) were all detected in fewer than 10 patches in 2021. These species are good candidates for control due to the infrequent number of patches.
- Russian knapweed (*Centaurea repens*) was not detected in 2021, demonstrating the success of past control efforts on this species.

IEPs Over Time

- When compared to 2018, there was a dramatic increase in the number of IEP patches in 2021, driven by rush skeletonweed and field bindweed. The spread in these two species has been widespread and rapid. For both species, more than 30% of patches were larger than 40 m².

Invasive exotic plants detected at Golden Spike NHP, June 24–25, 2021.

Scientific name	Common name
Chondrilla juncea[1]	rush skeletonweed
Convolvulus arvensis[1]	field bindweed
Isatis tinctoria[1]	dyer's woad
Lepidium latifolium[1]	broad-leaf pepperwort
Onopordum acanthium[1]	Scotch thistle
Verbascum blattaria[1]	moth mullein
Agropyron cristatum[2]	crested wheatgrass
Bromus tectorum[2]	cheatgrass
Sisymbrium altissimum[2]	tumble mustard
Aegilops cylindrica[3]	jointed goatgrass
Bromus diandra[3]	ripgut brome
Cynodon dactylon[3]	Bermuda grass
Cynoglossum officinale[3]	common hounds-tongue
Hyoscyamus major[3]	black henbane
Lactuca serriola[3]	prickly lettuce
Tamarix sp.[3]	tamarisk

[1]Priority species.
[2]Species recorded only in transects.
[3]Non-priority species.

- Rush skeletonweed may have increased due to excellent growing conditions in 2020, when the Northern Rocky Mountain Invasive Plant Management Team did not conduct control efforts due to covid-19.
- Percent frequency of cheatgrass, crested wheatgrass, and tumble mustard has not changed dramatically across sampling years. But overall, these species remain widespread.

Future Work

Seven non-priority species were also detected in 2021 (see table). The network will review the priority list for 2023 based on these observations and park concerns. Network staff will return for an eighth year of monitoring in 2023.

For more information, see D.W. Perkins, *Invasive Exotic Plant Monitoring at Golden Spike National Historical Park: 2021 Field Season*