



Plant Community Composition and Structure Monitoring at Fort Laramie National Historic Site

2018 Data Report

Natural Resource Data Series NPS/NGPN/NRDS—2019/1212



ON THE COVER

The rolling prairie of Fort Laramie National Historic Site

Photo by Ryan Manuel, National Park Service

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March 2019

U.S. Department of the Interior
National Park Service
Natural Resource Stewardship and Science
Fort Collins, Colorado

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Please cite this publication as:

Ashton, I. W., and C. J. Davis. 2019. Plant community composition and structure monitoring at Fort Laramie National Historic Site: 2018 data report. Natural Resource Data Series NPS/NGPN/NRDS—2019/1212. National Park Service, Fort Collins, Colorado.

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Abstract

This report presents the results of vegetation monitoring efforts in 2018 at Fort Laramie National Historic Site (FOLA) by the Northern Great Plains Inventory and Monitoring Network (NGPN). This was the eighth year of combined monitoring efforts.

Crew members from NGPN visited six long-term monitoring plots to collect data on the plant communities at FOLA. This work is part of a long-term monitoring effort designed to provide a better understanding of the condition of the vegetation community and how it changes over time. NGPN staff measured species richness, herb-layer height, native and non-native species abundance, ground cover, and site disturbance at each of the six plots. In plots where woody species were present, tree regeneration, tall shrub density, tree density, and woody fuel loads were also measured. We found one plot had been eroded into the Laramie River since it was last visited and we were not able to collect plant data there. It will be replaced in the future if it remains underwater.

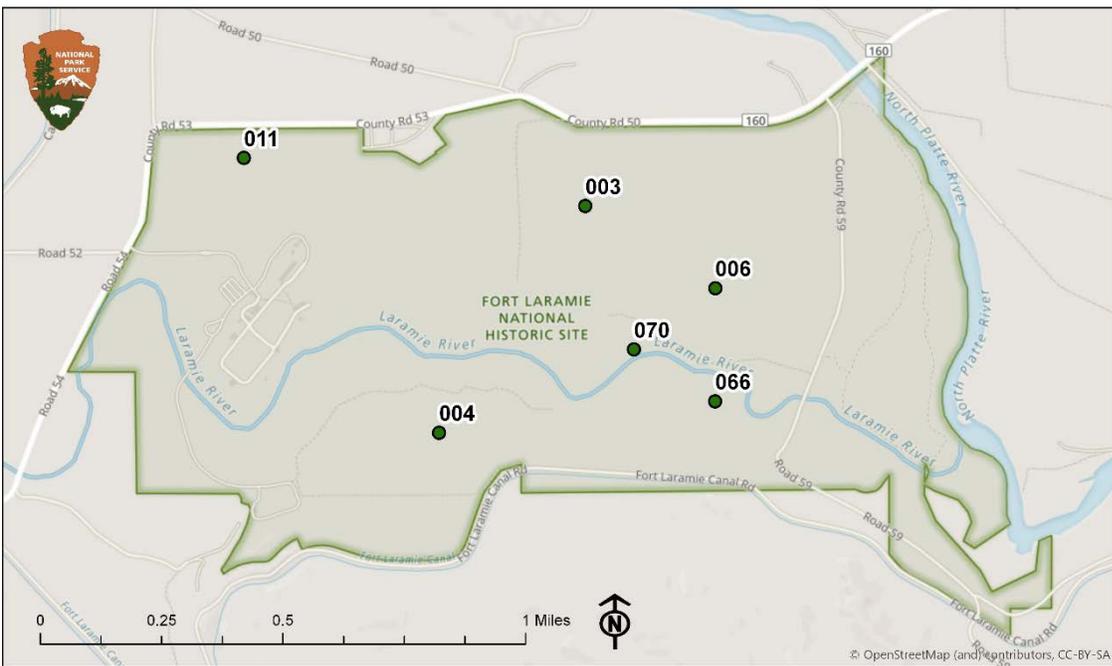
In 2018, the monitoring crews identified 77 unique plant species in 5 monitoring plots. Of those species, 19 were exotic species or of unknown origin. Two of the five plots were dominated by exotic plants. One rare species in the state of Wyoming, Emory's sedge (*Carex emoryi*), was observed in a riparian plot.

Acknowledgments

We thank all the authors of the NGPN Plant Community Monitoring Protocol, particularly A. Symstad, for outstanding guidance on data collection and reporting. Thank you to the staff at FOLA for providing logistical support. The 2018 NGPN vegetation field crew—I. Ashton, R. Manuel, and T. Schaffner collected the data included in this report.

Introduction

Fort Laramie National Historic Site (FOLA) was established in 1938 to protect and preserve the well-known military post that occupies 833 acres on the boundary of the northern mixed-grass and short-grass prairie region (Lauenroth et al. 1999). The park is a mosaic of disturbed old-fields, riparian forests, and native prairie (Heidel 2004). The Northern Great Plains Inventory & Monitoring Program (NGPN) began vegetation monitoring at FOLA in 2011 (Ashton et al. 2012) and has revisited the park every year between 2011 and 2018. A total of 30 permanent vegetation monitoring plots were established at FOLA between 2011 and 2014. Of these 30 plots, 10 plots were randomly distributed throughout the park to better study herbaceous plant communities, 15 plots were established in the riparian forest to assess forest condition, and five plots were used to study both riparian forest condition and herbaceous plant communities (Ashton and Davis 2016). In this report, we provide summaries of the data collected from four upland plots and one riparian plot in 2018 (Figure 1). An additional riparian plot was visited, but it was flooded and we were unable to collect vegetation data.



Fort Laramie National Historic Site
Fort Laramie WY 82212

Northern Great Plains Inventory & Monitoring Network
National Park Service
2/25/2019

2018 Plant Community Monitoring

- Plant Community Plot
- Road
- Trail

Figure 1. Map of Fort Laramie National Historic Site plant community monitoring plots visited in 2018 by the Northern Great Plains Network Inventory & Monitoring Program.

Methods

The NGPN Plant Community Composition and Structure Monitoring Protocol (Symstad et al. 2012b, a) describes in detail the methods used for sampling long-term plots. The general approach is briefly described below. For more detail, please see the monitoring protocol and standard operating procedures, available at <https://www.nps.gov/im/ngpn/plant-communities.htm>.

Sample Design

We implemented a survey to monitor plant community structure and composition in FOLA using a spatially balanced probability design (Generalized Random Tessellation Stratified [GRTS]; Stevens and Olsen 2003, 2004). Using a GRTS design, we selected 15 randomly located sites within FOLA where we established vegetation monitoring plots (Figure 1). Ten sites are in upland areas of the park and five sites are located along the riparian corridor. Each plot was assigned to one of five panels and two panels were visited per year. In total, six plots are visited each year (four in upland areas and two riparian areas), and after five years all 15 plots are visited twice. In 2018, we visited six plots during the last week of May (Table 1). We did not collect vegetation data from plot PCM_070 because the river has changed course and over 50% of the plot is now in the main channel of the Laramie River (Figure 2).

Table 1. Field journal for monitoring plot visits at Fort Laramie National Historic Site in 2018. A total of 6 plots were visited by Northern Great Plains Inventory & Monitoring Program.

Date Visited	Plot Name	Field Notes
May 29, 2018	PCM_004	Rain made field work slow
	PCM_011	–
May 30, 2018	PCM_006	–
	PCM_066	Bad rattlesnake interaction
	PCM_070	The B transect line is now in the Laramie River, plot made dormant.
May 31, 2018	PCM_003	–



Figure 2. Monitoring plot PCM_070 at Fort Laramie National Historic Site was flooded by the Laramie River in 2018.

Plot Layout and Sampling

At each site visited, the NGPN crew recorded plant species cover and frequency in a rectangular, 50 m x 20 m (0.1 ha), permanent plot (Figure 3). Data on ground cover, herb-layer height (≤ 2 m), and plant cover were collected on two 50 m transects (the long sides of the plot) using a point-intercept method (Figure 4). Species richness data from the point-intercept method were supplemented with species presence data collected in five 1 m² quadrats located systematically along each transect (Figure 3). If a plant species was identified in the plot but was not included on the verified park species list, a voucher plant specimen was collected when possible and submitted to a botanist for independent verification.

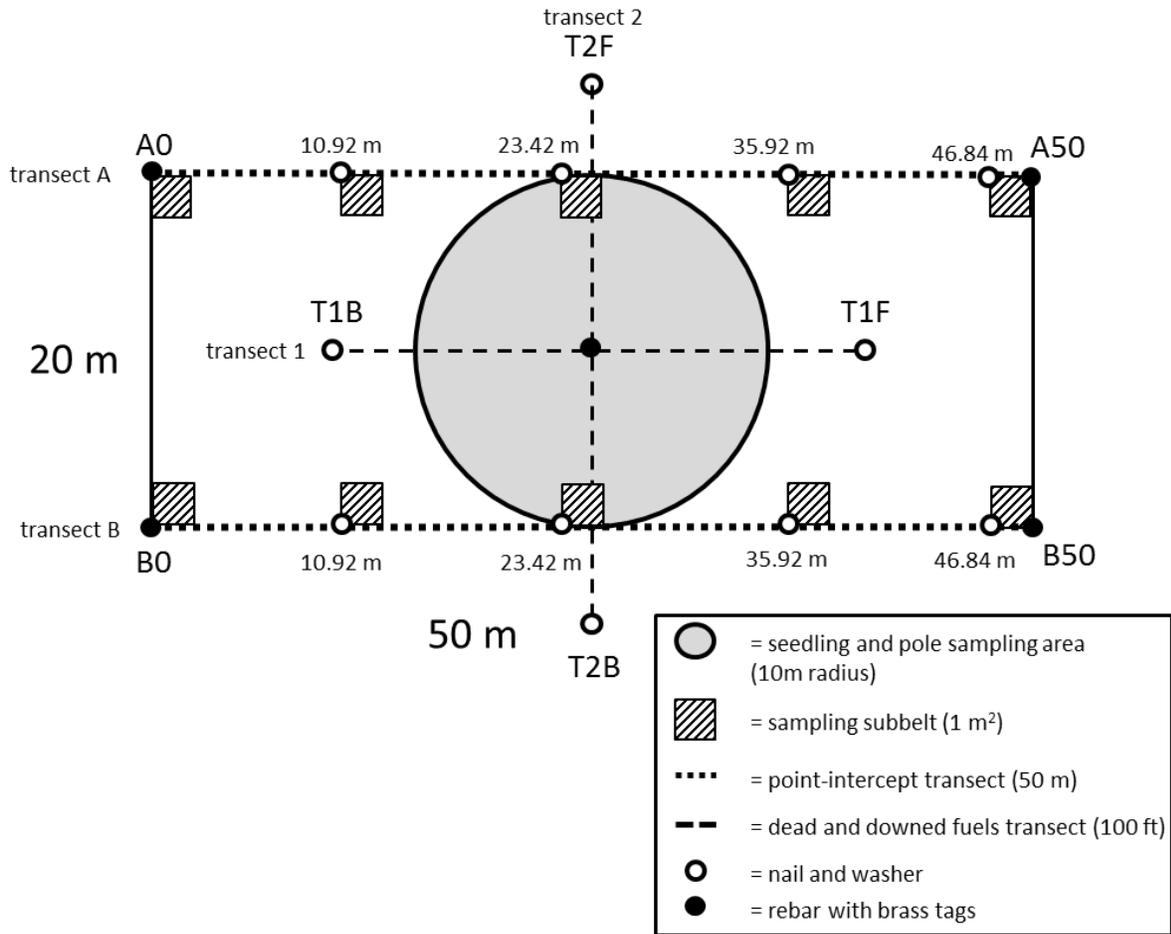


Figure 3. Long-term monitoring plot layout used for sampling vegetation used by the Northern Great Plains Inventory and Monitoring vegetation crew.



Figure 4. The Northern Great Plains Inventory & Monitoring vegetation crew uses point-intercept methods along a 50 meter transect (left panel) and quadrats (right panel) to document plant diversity and abundance.

When woody species were present within 38 m of plot center, tree regeneration and tall shrub density data were collected within a 10 m radius subplot centered in the larger 50 m x 20 m (0.1 ha) plot.

Trees within the entire 0.1 ha plot with a diameter at breast height (DBH) of > 15 cm were mapped and tagged. For each tree, the species, DBH, status (live or dead), and condition (e.g., leaf-discoloration, insect-damaged) were recorded. For all poles ($2.54 \leq \text{DBH} \leq 15$ cm) located within the 10 m radius subplot, only DBH and status were recorded. Tree and tall shrub species with DBH < 2.54 cm (seedlings) were tallied by species within the 10 m radius subplot. In 2018, NGPN changed the way these species counts were made. Previously, once the count for a species had reached 100, seedlings of that species were not counted in the following quarters and a calculated estimate was made when the data was analyzed. Now, all seedling species present are always counted or estimated in all four quarters of the 10 m radius subplot while in the field. Dead and downed woody fuel load data were collected along two perpendicular, 100 ft (30.49 m) transects (fuel lines) with midpoints at the center of the plot (Figure 2), following Brown’s Line methods (Brown 1974, Brown et al. 1982). Fuel load data were only collected if at least one piece of woody litter or fuel intersected a fuel line.

Common disturbances were assessed and documented at each plot. The type of disturbance, such as animal trails, erosion, or small mammal digging was recorded. In 2018 a new category called “soil disturbance” was added, which is defined as loose, exposed soil from all sources. Plots were also assessed for the presence and abundance of target exotic species (Table 2), which is critical for early detection and rapid response to exotic species threats. These species were chosen in collaboration with the Midwest Invasive Plant Network, Northern Great Plains Exotic Plant Management Team, park managers, and local weed experts. Each target species was assigned an abundance class from 1–5, based on an ocular estimate of cover, where 1 = one individual, 2 = few individuals, 3 = cover of 1–5%, 4 = cover of 5–25%, and 5 = cover > 25% of the plot.

Table 2. Exotic species included in the Northern Great Plains Network’s early detection and rapid response program.

Habitat	Scientific Name	Common Name
Riparian	<i>Alliaria petiolata</i>	garlic mustard
Riparian	<i>Polygonum cuspidatum</i> ; <i>P. sachalinense</i> ; <i>P. x bohemicum</i>	knotweeds
Riparian	<i>Pueraria montana var. lobata</i>	kudzu
Riparian	<i>Iris pseudacorus</i>	yellow iris
Riparian	<i>Ailanthus altissima</i>	tree of heaven
Riparian	<i>Lepidium latifolium</i>	perennial pepperweed
Riparian	<i>Arundo donax</i>	giant reed
Riparian	<i>Rhamnus cathartica</i>	common buckthorn
Riparian	<i>Heracleum mantegazzianum</i>	giant hogweed
Upland	<i>Centaurea solstitialis</i>	yellow star thistle
Upland	<i>Hieracium aurantiacum</i> ; <i>H. caespitosum</i>	orange and meadow hawkweed
Upland	<i>Isatis tinctoria</i>	Dyer's woad
Upland	<i>Taeniatherum caput-medusae</i>	medusahead

Table 2 (continued). Exotic species included in the Northern Great Plains Network’s early detection and rapid response program.

Habitat	Scientific Name	Common Name
Upland	<i>Chondrilla juncea</i>	rush skeletonweed
Upland	<i>Gypsophila paniculata</i>	baby's breath
Upland	<i>Centaurea virgata</i> ; <i>C. diffusa</i>	knapweeds
Upland	<i>Linaria dalmatica</i> ; <i>L. vulgaris</i>	toadflax
Upland	<i>Euphorbia myrsinites</i> & <i>E. cyparissias</i>	myrtle spurge
Upland	<i>Dipsacus fullonum</i> & <i>D. laciniatus</i>	common teasel
Upland	<i>Salvia aethiopsis</i>	Mediterranean sage
Upland	<i>Ventenata dubia</i>	African wiregrass

Data Management and Analysis

FFI (FEAT/FIREMON Integrated; <http://frames.gov/ffi/>) was the primary software environment used for managing our sampling data. FFI is used by a variety of agencies (e.g., NPS, USDA Forest Service, U.S. Fish and Wildlife Service), has a national-level support system, and generally conforms to the Natural Resource Database Template standards established by the Inventory and Monitoring Program. Species scientific names, codes, common names, and native status are from the USDA Plants Database (USDA-NRCS 2018). However, nomenclature follows the Integrated Taxonomic Information System (ITIS). In the few cases where ITIS recognized a new name that was not in the USDA PLANTS database, the new name was used, and a unique plant code was assigned.

After data were entered in the database, 100% of records were verified with the original data sheets to minimize transcription errors, followed by a 10% review of records to confirm accuracy. Automated queries were used to check for any remaining errors in the data. When errors were identified by the crew or the automated queries, corrections were made to the original datasheets and the FFI database.

Data summaries were produced using the FFI reporting and query tools. The number of species encountered in each plot was calculated using data from point-intercept, quadrat, woody species, and target species protocols. Absolute cover was calculated using point-intercept data and is the total number of vegetation intercepts. This is often greater than 100% because more than one species can be intercepted per point due to overlapping vegetation.

The conservation status rank of plant species observed at FOLA in 2018 was determined by cross-referencing with the NatureServe conservation status list, as well as the Nebraska rare plant species lists. For the purpose of this report, a species is considered rare or of conservation concern if its global (G) or state (S) conservation status rank is classified as critically imperiled (G1/S1), imperiled (G2/S2), or vulnerable (G3/S3). The 2018 species list was also cross-referenced with the list of county and state noxious weeds maintained by Wyoming Department of Agriculture.

Results

There are 382 vascular plant species on the [FOLA species list](#), and NGPN crews identified a total of 77 species from five monitoring plots in 2018 (Table 3). Of these species, 19 are exotic or unknown origin species for the park. The 2018 species list was cross-referenced with state-wide rare and noxious exotic species lists for Nebraska. We found two species considered noxious in Wyoming: Canada thistle (*Cirsium arvense*) and Scotch thistle (*Onopordum acanthium*). We observed one rare species, Emory's sedge (*Carex emoryii*) in a riparian plot. This species is globally secure but on the edge of its range in Wyoming.

Table 3. List of all plant species identified in Fort Laramie National Historic Site plant community monitoring plots in 2018. In the Notes column, "Exotic" indicates that a species is not native to the park or, in the case where only the genus was identified, there are some species within that genus that are exotic. State noxious weed species are designated in the Notes column. The conservation concern is listed for rare species. .

Family	Species Code	Scientific Name	Common Name	Notes
Asclepiadaceae	ASVI	<i>Asclepias viridiflora</i>	green comet milkweed	–
Asteraceae	AMPS	<i>Ambrosia psilostachya</i>	Cuman ragweed	–
Asteraceae	ARCA12	<i>Artemisia campestris</i>	field sagewort	–
Asteraceae	ARFI2	<i>Artemisia filifolia</i>	sand sagebrush	–
Asteraceae	ARFR4	<i>Artemisia frigida</i>	prairie sagewort	–
Asteraceae	ARLU	<i>Artemisia ludoviciana</i>	white sagebrush	–
Asteraceae	CIAR4	<i>Cirsium arvense</i>	Canada thistle	Exotic; Noxious
Asteraceae	CIFL	<i>Cirsium flodmanii</i>	Flodman's thistle	–
Asteraceae	COCA5	<i>Conyza canadensis</i>	Canadian horseweed	–
Asteraceae	DICA18	<i>Dieteria canescens</i>	hoary tansyaster	–
Asteraceae	EUOC4	<i>Euthamia occidentalis</i>	western goldentop	–
Asteraceae	GRSQ	<i>Grindelia squarrosa</i>	curlycup gumweed	–
Asteraceae	HELIA3	<i>Helianthus</i>	sunflower	–
Asteraceae	LASE	<i>Lactuca serriola</i>	prickly lettuce	exotic
Asteraceae	ONAC	<i>Onopordum acanthium</i>	Scotch cottonthistle	Exotic; Noxious
Asteraceae	PAPL12	<i>Packera plattensis</i>	prairie groundsel	–
Asteraceae	SYER	<i>Symphotrichum ericoides</i>	white heath aster	–
Asteraceae	TAOF	<i>Taraxacum officinale</i>	common dandelion	exotic
Asteraceae	TRDU	<i>Tragopogon dubius</i>	yellow salsify	exotic
Boraginaceae	LAOC3	<i>Lappula occidentalis</i>	flatspine stickseed	–
Brassicaceae	ALDE	<i>Alyssum desertorum</i>	desert madwort	exotic
Brassicaceae	DEPI	<i>Descurainia pinnata</i>	western tansymustard	–
Brassicaceae	ERAS2	<i>Erysimum asperum</i>	western wallflower	–

Table 3 (continued). List of all plant species identified in Fort Laramie National Historic Site plant community monitoring plots in 2018. In the Notes column, “Exotic” indicates that a species is not native to the park or, in the case where only the genus was identified, there are some species within that genus that are exotic. State noxious weed species are designated in the Notes column. The conservation concern is listed for rare species.

Family	Species Code	Scientific Name	Common Name	Notes
Brassicaceae	LEDE	<i>Lepidium densiflorum</i>	common pepperweed	–
Brassicaceae	SIAL2	<i>Sisymbrium altissimum</i>	tall tumbled mustard	exotic
Cactaceae	OPMA2	<i>Opuntia macrorhiza</i>	twistspine pricklypear	–
Cactaceae	OPPO	<i>Opuntia polyacantha</i>	plains pricklypear	–
Chenopodiaceae	CHENO	<i>Chenopodium</i>	goosefoot	exotic
Chenopodiaceae	SATR12	<i>Salsola tragus</i>	prickly Russian thistle	exotic
Commelinaceae	TROC	<i>Tradescantia occidentalis</i>	prairie spiderwort	–
Cyperaceae	CADO2	<i>Carex douglasii</i>	Douglas' sedge	–
Cyperaceae	CADU6	<i>Carex duriuscula</i>	needleleaf sedge	–
Cyperaceae	CAEM2	<i>Carex emoryi</i>	Emory's sedge	S1
Cyperaceae	CAPR5	<i>Carex praegracilis</i>	clustered field sedge	–
Cyperaceae	CAREX	<i>Carex</i>	sedge	–
Cyperaceae	ELPA3	<i>Eleocharis palustris</i>	common spikerush	–
Elaeagnaceae	SHAR	<i>Shepherdia argentea</i>	silver buffaloberry	–
Equisetaceae	EQLA	<i>Equisetum laevigatum</i>	smooth horsetail	–
Euphorbiaceae	EUPHO	<i>Euphorbia</i>	spurge	–
Fabaceae	GLLE3	<i>Glycyrrhiza lepidota</i>	American licorice	–
Fabaceae	MEOF	<i>Melilotus officinalis</i>	yellow sweetclover	exotic
Grossulariaceae	RIAU	<i>Ribes aureum</i>	golden currant	–
Lamiaceae	MEAR4	<i>Mentha arvensis</i>	wild mint	–
Lamiaceae	SCGA	<i>Scutellaria galericulata</i>	marsh skullcap	–
Lemnaceae	LETU2	<i>Lemna turionifera</i>	turion duckweed	–
Malvaceae	SPCO	<i>Sphaeralcea coccinea</i>	scarlet globemallow	–
Oleaceae	FRPE	<i>Fraxinus pennsylvanica</i>	green ash	–
Onagraceae	OEAL	<i>Oenothera albicaulis</i>	whitest evening-primrose	–
Onagraceae	OECU2	<i>Oenothera curtiflora</i>	velvetweed	–
Onagraceae	OESU99	<i>Oenothera suffrutescens</i>	scarlet beeblossom	–
Plantaginaceae	PLPA2	<i>Plantago patagonica</i>	woolly plantain	–
Poaceae	BOGR2	<i>Bouteloua gracilis</i>	blue grama	–
Poaceae	BRIN2	<i>Bromus inermis</i>	smooth brome	exotic
Poaceae	BRJA	<i>Bromus japonicus</i>	Japanese brome	exotic

Table 3 (continued). List of all plant species identified in Fort Laramie National Historic Site plant community monitoring plots in 2018. In the Notes column, “Exotic” indicates that a species is not native to the park or, in the case where only the genus was identified, there are some species within that genus that are exotic. State noxious weed species are designated in the Notes column. The conservation concern is listed for rare species.

Family	Species Code	Scientific Name	Common Name	Notes
Poaceae	BRTE	<i>Bromus tectorum</i>	cheatgrass	exotic
Poaceae	CALO	<i>Calamovilfa longifolia</i>	prairie sandreed	–
Poaceae	HECO26	<i>Hesperostipa comata</i>	needle and thread	–
Poaceae	PACA6	<i>Panicum capillare</i>	witchgrass	–
Poaceae	PASM	<i>Pascopyrum smithii</i>	western wheatgrass	–
Poaceae	POPR	<i>Poa pratensis</i>	Kentucky bluegrass	exotic
Poaceae	SPCR	<i>Sporobolus cryptandrus</i>	sand dropseed	–
Poaceae	VUOC	<i>Vulpia octoflora</i>	sixweeks fescue	–
Polygonaceae	ERAN4	<i>Eriogonum annuum</i>	annual buckwheat	–
Polygonaceae	PEMA24	<i>Persicaria maculosa</i>	spotted ladythumb	exotic
Polygonaceae	RUMEX	<i>Rumex</i>	dock	exotic
Ranunculaceae	RACY	<i>Ranunculus cymbalaria</i>	alkali buttercup	–
Rosaceae	POSU25	<i>Potentilla supina</i>	Paradox cinquefoil	–
Salicaceae	PODE3	<i>Populus deltoides</i>	eastern cottonwood	–
Salicaceae	SAAM2	<i>Salix amygdaloides</i>	peachleaf willow	–
Salicaceae	SAEX	<i>Salix exigua</i>	narrowleaf willow	–
Typhaceae	TYAN	<i>Typha angustifolia</i>	narrowleaf cattail	–
Unknown family	UNKFORBANN	<i>Unknown annual forb</i>	unknown annual forb	exotic
Unknown Family	UNKFORB	<i>Unknown forb</i>	unknown forb	exotic
Unknown Family	UNKGRAM	<i>Unknown graminoid</i>	unknown graminoid	exotic
Verbenaceae	VEBR	<i>Verbena bracteata</i>	bigbract verbena	–
Verbenaceae	VEHA2	<i>Verbena hastata</i>	swamp verbena	–
Vitaceae	PAVI5	<i>Parthenocissus vitacea</i>	woodbine	–

Based on the total count of species observed in each plot in 2018, PCM_066 had the highest number with 41 total species (Table 4). This plot also had the most native diversity with 29 native species identified. PCM_066 was the only riparian plot we monitored in 2018 and included woodland, wetland, and grassland species (Figure 5). Absolute cover calculations (Table 5) reflected a greater percent of native species cover compared to exotic species cover in three of the five plots. FOLA_PCM_004 had the highest absolute native species cover, and PCM_003 had the highest absolute exotic species cover (Table 5). We found exotic species at every plot in FOLA and they were abundant in all the upland plots.

Table 4. Total number of plant species identified in each of the plots monitored at Fort Laramie National Historic Site in 2018. This is a count of all unique species identified in the plot using species data from point-intercept, quadrat, woody species, and target species protocols.

MacroPlot Name	Exotic Species	Native Species	Total species
FOLA_PCM_003	7	8	15
FOLA_PCM_004	8	18	26
FOLA_PCM_006	7	23	30
FOLA_PCM_011	6	21	27
FOLA_PCM_066	12	29	41



Figure 5. Long-term monitoring plot PCM_066 at Fort Laramie National Historic Site is located along the river and was the only location in 2018 to have tree species present. It was also the most diverse plot. Photograph courtesy of the National Park Service.

Table 5. Absolute percent cover of native and exotic plant species in plots monitored at Fort Laramie National Historic Site in 2018. Absolute percent cover is calculated using the point-intercept data. This includes overlapping species canopies, which can result in values greater than 100%.

Plot	Absolute % Exotic Cover	Absolute % Native Cover
FOLA_PCM_003	112	46
FOLA_PCM_004	47	117
FOLA_PCM_006	98	61
FOLA_PCM_011	73	104
FOLA_PCM_066	9	42

The NGPN monitoring crew collected woody species data in only one plot in 2018, PCM_066 (Figure 5). We found all size classes of eastern cottonwood (Table 6) and a high density of willow seedlings. We also measured surface fuels at PCM_066 and found it averaged 3.9 tons per acre (Table 7). We looked for fuels and seedlings at two other sites where trees were present with 39 m of the center of the plot, but found neither seedlings nor surface fuels in the plots.

Table 6. Woody species data from Fort Laramie National Historic Site in 2018, monitoring plot PCM_066. Size class categories are determined by diameter at root collar or breast height where trees >15 cm, poles <15cm but > 2.54cm, and seedlings are < 2.5cm.

Species	Size Class	Status	Count	Density (stems per hectare)
eastern cottonwood	Tree	Live	13	130
	Pole	Live	13	414
	Seedling	Live	192	6111
silver buffaloberry	Pole	Live	1	32
green ash	Seedling	Live	1	32
peachleaf willow	Seedling	Live	8	255
narrowleaf willow	Seedling	Live	1000	31827

Table 7. Surface fuels summary for three plots at Fort Laramie National Historic Site in 2018.

Plot	Average Tons per Acre									Avg. Depth (in.)			
	1-hr	10-hr	100-hr	1-100-hr	1000-hr sound	1000-hr rotten	1-1000-hr	Duff	Litt	Total	Duff	Litt	Total
PCM_004	0	0	0	0	0	0	0	0	0	0	0	0	0
PCM_006	0	0	0	0	0	0	0	0	0	0	0	0	0
PCM_066	0	0	0.63	0.63	0	0.89	1.52	0.27	2.08	3.87	0	1.3	1.3

Disturbances occurred at many of the plots visited in 2018 (Table 8). A variety of disturbance types were observed, including ATV tracks and small mammal disturbance. The largest disturbance was the flooding in PCM_070 (Figure 2).

Table 8. Disturbance types and occurrence in plant community monitoring plots visited in 2018 at Fort Laramie National Historic Site.

Plot	Disturbance Type	Notes	Area (m ²)
FOLA_PCM_004	Other	seep/ ravine (standing water)	250
FOLA_PCM_004	Small Mammal	–	60
FOLA_PCM_004	Soil Disturbance	–	75
FOLA_PCM_003	Off-Road	light UTV tracks	50
FOLA_PCM_003	Small Mammal	–	5
FOLA_PCM_003	Soil Disturbance	–	5
FOLA_PCM_011	Off-Road	ATV tracks	20
FOLA_PCM_011	Small Mammal	–	35
FOLA_PCM_011	Soil Disturbance	–	35
FOLA_PCM_066	Flood	permanent seep/marsh	28
FOLA_PCM_066	Soil Disturbance	sand bar	900
FOLA_PCM_006	Animal Trail	–	3
FOLA_PCM_006	Graz	–	5
FOLA_PCM_006	Small Mammal	–	12
FOLA_PCM_006	Soil Disturbance	–	15
FOLA_PCM_004	Other	seep/ ravine (standing water)	250
FOLA_PCM_004	Small Mammal	–	60
FOLA_PCM_004	Soil Disturbance	–	75
FOLA_PCM_003	Off-Road	light UTV tracks	50
FOLA_PCM_003	Small Mammal	–	5
FOLA_PCM_003	Soil Disturbance	–	5
FOLA_PCM_011	Off-Road	ATV tracks	20
FOLA_PCM_011	Small Mammal	–	35
FOLA_PCM_011	Soil Disturbance	–	35
FOLA_PCM_066	Flood	permanent seep/marsh	28
FOLA_PCM_066	Soil Disturbance	sand bar	900
FOLA_PCM_006	Animal Trail	–	3
FOLA_PCM_006	Graz	–	5
FOLA_PCM_006	Small Mammal	–	12
FOLA_PCM_006	Soil Disturbance	–	15

Further Analysis

This Data Report is intended to provide a basic review of the data collected during the NGPN team's 2018 visit to Fort Laramie National Historic Site. All data included in this report is available upon request from the Northern Great Plains Inventory and Monitoring Network, as well as in the archives found in the [IRMA Data Store](#).

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NPS 375/150773, March 2019

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