From: "Rodgers, Jane JER" <Jane_Rodgers@nps.gov>
Date: September 8, 2021 at 3:19:06 PM PDT
Subject: MMNA Help Requested: nonnative plants spreading into park

MMNA Help Requested
The park is suffering from invasions of nonnative plants growing from bird seed. We ask MMNA to help us mitigate the negative impacts to park native wildflowers, rodents, and birds by working together to find ways to enjoy wildlife without impacting the park.

Below is a description of the issue and what the park is doing to respond. We invite MMNA to meet with the park to discuss options and ideas to better protect wildlife, plants, and wilderness.

Thank you—Jane Rodgers, Acting Superintendent


MILLET


SORGHUM


SUNFLOWER

Joshua Tree National Park
2021 West Entrance Millet, Sorghum and Sunflower Weed Infestation

Issue

- An infestation of millet, sorghum, and sunflowers was discovered by park staff in 2015. **The source of all three species was then believed to be wild bird seed scattered by area residents along the park boundary line.** Wildlife (including ants, birds, or ground squirrels) may be moving surplus seeds from private lands into the park.
    - In 2015, the park spent a lot of staff time pulling, bagging, and hauling off 44,027 millet sprouts and 3,861 sorghum sprouts, and nearly 100 sunflowers.
- A recurring infestation was noticed by park staff on 19 August 2021 (see map below).
    - Recent monsoonal rains triggered another large flush of weeds.
    - The infestation is generally the same size, but appears have traveled slightly further southward into the park since 2015.
    - Removing these weeds ASAP before they set new seed is critical for effective control.
        - Initial treatment efforts in 2015 were timed in late Fall, and it is likely that this allowed for them to flower and seed to drop before they were pulled.
        - If the area receives additional precipitation in the coming weeks, it's likely the plants will successfully complete flowering and seed production.
        - A significant portion of this infestation exists beyond the park boundary, long term control of this infestation within will require cooperation and control efforts by neighboring land owners.

- Species information: Two annual grasses of the family Poaceae: *Panicum miliaceum* (Millet) and *Sorghum bicolor* (Sorghum) and the annual wildflower *Helianthus annuus* (Sunflower). Millet and sorghum appear to be the most numerous part of the infestation.
    - Sorghum presents a particularly alarming threat of outcompeting native plants. The roots of Sorghum exude an allelopathic chemical, sorgoleone, which can inhibit the growth of other plants even at extremely low concentrations.
    - Millet impacts native habitat via (1) competition with native grasses or forbs, (2) an increase in fire risk (when dry it creates a continuous flashy fuel load), (3) a decrease in the pristine qualities of wilderness especially if it spreads further into the Park, and (4) alteration of wildlife foraging habits.
    - Since these plants are highly palatable to wildlife, especially birds and rodents, they easily spread if allowed to mature seed. If not removed, these plants can negatively affect forage availability and habitat for native plants and wildlife.
    - Removing these plants will alleviate the negative pressure on native plants and their habitat.
    - The park reached out to millet expert Rob Myers, Ph.D. Director, Center for Regenerative Agriculture at the University of Missouri to inform our approach and understanding of the biology of these weeds.

Action

The 2021 infestation covers approximately 65 acres, and is most dense immediately bordering the Park boundary. All three species will be treated with a combination of hand-pulling and foliar spot spray of herbicide with backpack sprayers and avoid non-target impacts on native plants. Herbicide application method will consist of the careful foliar application of 5% Glyphosate (RoundUp Pro Concentrate) mixed with a blue indicator dye (Tracker Max) applied to individual plants with backpack sprayer applicators. Work will be performed by park staff certified in herbicide application. Staff are required to monitor site specific weather to avoid non-target effects of herbicide on surrounding vegetation. Spraying is not allowed during windy or rainy conditions. Spot spraying individual plants reduces total herbicide used, and avoids overspray and drift of herbicide when applied in low wind and with proper technique. Crews will hand pull plants that are growing within native shrub canopy to reduce non-target effects, and for plants that have mature seed. Pulled plants will be bagged in 55gallon contractor bags for disposal at a landfill. All work will be mapped and documented to track this over time. Treatment will occur from August 2021 to September 2021.

Other considerations

- Hand pulling alone is labor intensive that will take at least three times longer to complete and requires significant ground disturbance. This soil disturbance could potentially affect cultural resources as well as assist new weed recruitment. Delay in removal allows plants to flower and produce seed, adding to the infestation.
- String trimmers could be used; however, these plants could send up a new seed head from the base after trimming, especially if additional monsoonal precipitation occurs after treatment. Many plants are growing in such a way that it would be difficult or impossible to effectively string trim without also string trimming significant amounts of native vegetation.
- Long term success depends on the park's ability to partner with local communities to reduce the spread of millet, sorghum, and sunflowers into the park.

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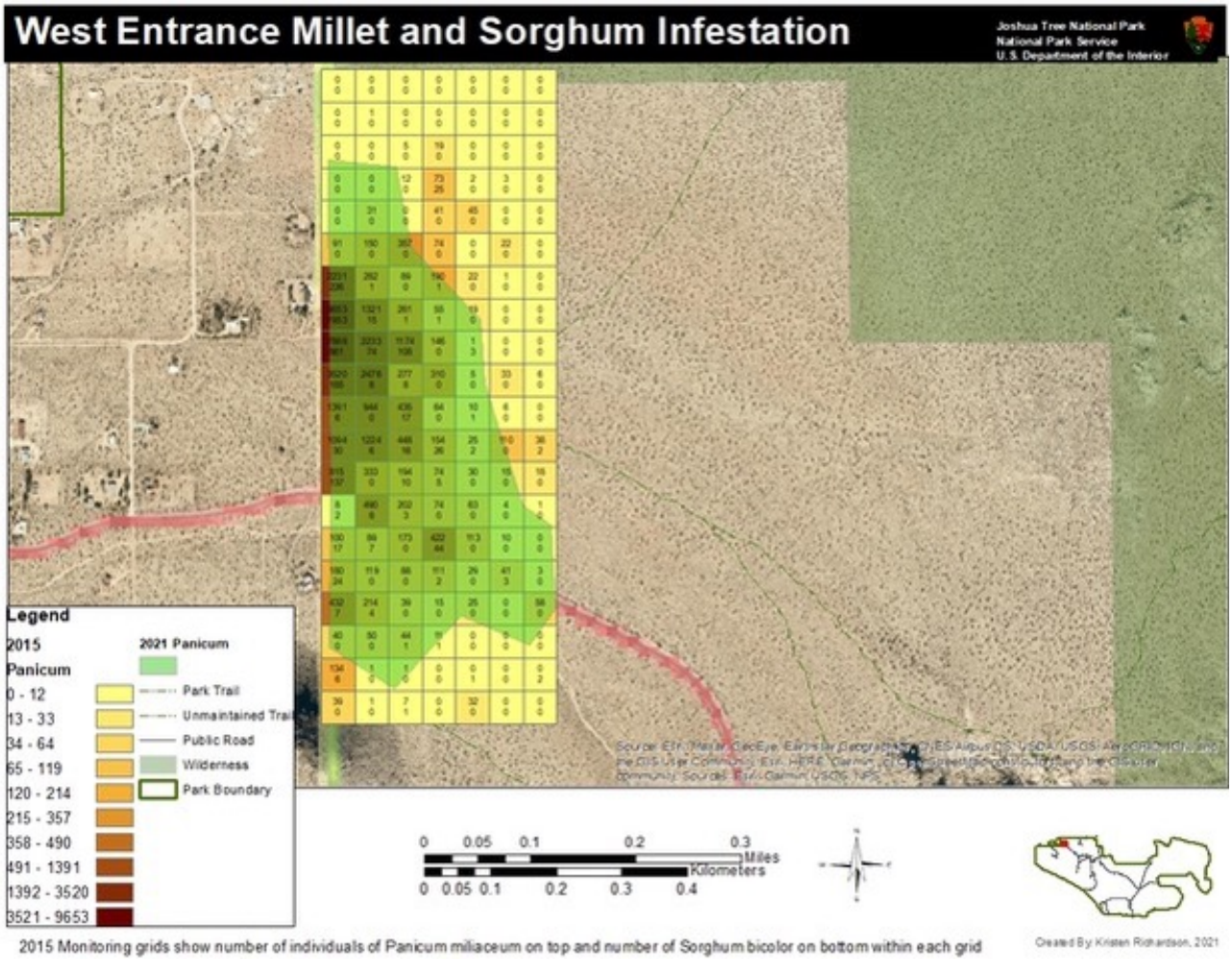

2015 Monitoring grids show number of individuals of Panicum miliaceum on top and number of Sorghum bicolor on bottom within each grid