Manatee Mudflower (*Micranthemum glomeratum*) Field Survey near Nu‘uanu Pali Drive, O‘ahu

Hawai‘i Division of Aquatic Resources

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Field Report

Executive Summary

On July 6, 2023, the Division of Aquatic Resources Aquatic Invasive Species (DAR AIS) Team received a report of manatee mudflower (*Micranthemum glomeratum*) growing on a dam found off of Nu‘uanu Pali Drive on O‘ahu, Hawai‘i. Direct coordinates and photographs for the sighting of *M. glomeratum* were reported to DAR by Botanist Kevin Faccenda on June 8, 2023. Kevin Faccenda has found several new state records for introduced plant species during surveys and was able to confirm this species as *Micranthemum glomeratum*. On July 26, 2023, the DAR AIS Team responded by performing a reconnaissance mission to confirm the report and determine the exact location, size of growth, and initial spread of *M. glomeratum* in Nu‘uanu stream. On September 5, 2023 the DAR AIS Team returned to conduct a more inclusive survey to obtain a better understanding of the downstream distribution of *M. glomeratum*. Members surveyed 400 meter (m) downstream of the initial report site before approaching a waterfall and residential area. *Micranthemum glomeratum* was observed scattered on various hard substrates, primarily rocks, up to approximately 200 m downstream of the initial report site. *Micranthemum glomeratum* was not observed in the remaining area surveyed.

Introduction

Micranthemum glomeratum, commonly known as manatee mudflower, is a freshwater iku plant species endemic to Florida wetland habitats (Wunderlin et al 2023). *Micranthemum glomeratum* is a common freshwater aquarium plant (Hemianthus glomeratus - Manatee Mudflower 2023). Information on *M. glomeratum* is limited, and there is currently no information on the invasiveness status of *M. glomeratum*. However, according to aquarium sites, M. glomeratum has a fast growth rate, relies on medium to high sunlight, and is relatively easy to grow (Hemianthus glomeratus - Manatee Mudflower 2023). While the rapid growth rate of this species could lead to a fast spread in the areas it was introduced, there is no current documented evidence on *M. glomeratum* being invasive outside of its native range. This is the first recorded presence of *M. glomeratum* in Hawai‘i and the time of introduction is unknown.

On July 6, 2023, the DAR AIS Team received a report of *M. glomeratum* growing on a dam found off of Nu‘uanu Pali Drive on O‘ahu (21.347005, -157.821007). Direct coordinates and photographs for the sighting of *M. glomeratum* were reported to iNaturalist, a crowd-sourcing website that tracks species sightings, by Botanist Kevin Faccenda on June 8, 2023. Kevin Faccenda was able to confirm the species identification. Photographs of *M. glomeratum* taken on June 8, 2023 show a large patch measuring approximately 1 m wide and stretching down the dam approximately 2 m (Figure 1A). On July 26, 2023 during the initial reconnaissance survey, the large patch previously observed appeared to have decreased in size, possibly due to recent storm runoff (Figure 1B). General presence was surveyed during the reconnaissance, however a more inclusive distribution survey is needed to better understand the scope of the spread.

Figure 1: Photographs of *Micranthemum glomeratum* growing on a dam located under Nu'uanu Pali Drive. **A)** Photo taken on June 8, 2023 by M. Ross, facing downstream and to the South, of *Micranthemum glomeratum* growing on the dam; **B)** Photo taken on July 26, 2023 facing downstream and to the South, of *Micranthemum glomeratum* growing on the dam; **C)** Photo taken on September 5, 2023 facing downstream and to the East, of *Micranthemum glomeratum* growing on the dam.

Field Operation & Results

On September 5, 2023, the DAR AIS Team conducted a distribution survey of *M. glomeratum* in the Nu'uanu Stream. Members of the DAR AIS Team started at the initially reported site of *M. glomeratum*, located along the dam, and moved downstream surveying the width of the stream for presence of *M. glomeratum*. Using handheld GPS devices, a camera, and a scale bar, technicians were able to collect GPS points for the location and approximate size of *M. glomeratum* patches, as well as document the type of substrate it was growing on and photograph the area. Technicians surveyed approximately 400 m downstream of the dam before approaching a waterfall and residential area at which point the survey ceased. *Micranthemum glomeratum* was observed approximately 200 m downstream of the initially reported cluster on the dam (Figure 2).

The large centrally-located patch of manatee mudflower growing on the slope of the dam had grown in size since the last observation (Figure 1C). There were other smaller patches located on the slope of the dam, approximately 10-15 centimeter (cm), and presence of *M. glomeratum* along the edges of the dam at the bridge basin (Figure 3). Surveying downstream, 12 individual patches of *M. glomeratum* were observed within the initial 200 m of the survey (Figure 2). Patches of *M. glomeratum* ranged in sizes from <1 cm to 20 cm, with the largest patch observed in the stream being approximately 20 cm long (Figure 4). All patches observed were growing on hard substrates, primarily rocks in the stream. Presence of *M. glomeratum* was not observed in the remaining 200 m of the survey. The full distribution of *M. glomeratum* in the stream is still uncertain; *M. glomeratum* can propagate via water transport of plant propagules, and other specimens may have settled elsewhere along the stream.

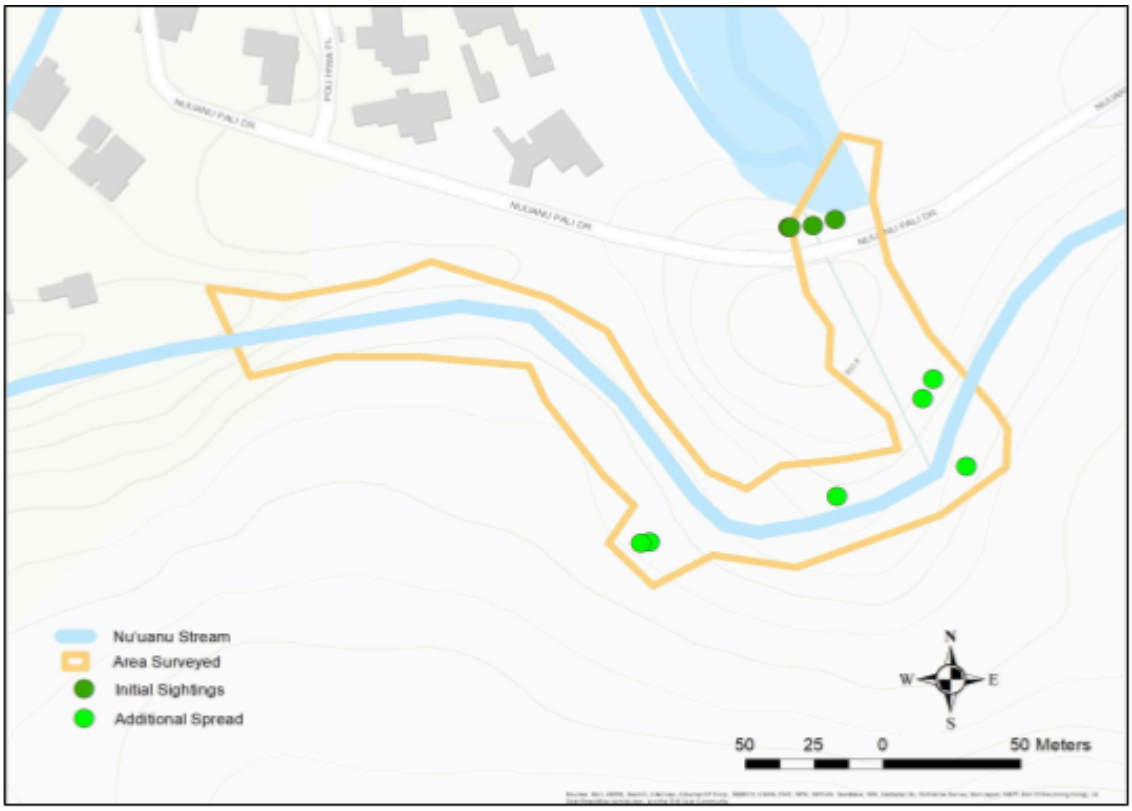

Figure 2: Map of the area surveyed for *Micranthemum glomeratum* in the Nu'uanu Stream off of Nu'uanu Pali Drive. The DAR AIS Team started at the Initial Sightings (dark green circle) of *M. glomeratum* and surveyed down stream. The total Area Surveyed is outlined in orange. Additional Spread of *M. glomeratum* is in light green circles.

Figure 3: Photographs of *Micranthemum glomeratum* at the initial report site (21.347005, -157.821007) growing on the dam located under the bridge on Nu'uanu Pali Drive; **A)** Facing downstream, large patch of M. glomeratum with smaller patches growing down the slope of the dam; **B)** Facing downstream and to the right, *M. glomeratum* growing on the lower right where the bridge wall meets the dam basin.

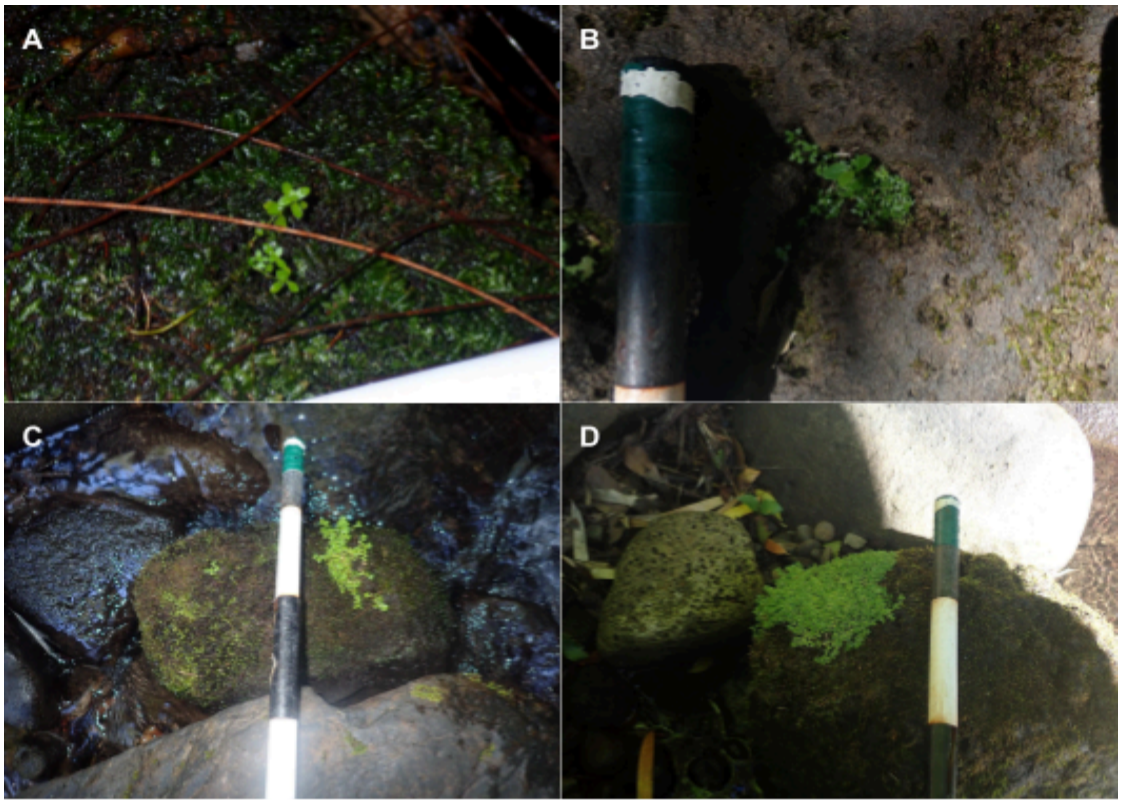

Figure 4: Photographs of *Micranthemum glomeratum* patches growing on different rocks found in Nu'uanu Stream; **A)** A sprout of *M. glomeratum* approximately 1 cm in size; **B)** A small patch of *M. glomeratum* growing in a hole in a rock approximately 3 cm in size; **C)** Two small patches of *M. glomeratum* growing on the same rock, the left patch is approximately 1 cm in size and the right patch is approximately 10 cm in length; **D)** Patch of *M. glomeratum* approximately 20 cm long and 10 cm wide.

Conclusion

Eradication of *M. glomeratum* at this particular site would come with challenges. *Micranthemum glomeratum* is growing on the slope of a dam that connects to a stream, making hand removal difficult. Furthermore, hand removal could aid in the spread of the species and there is a strong possibility that patches of *M. glomeratum* could go unnoticed. The DAR AIS Team consulted with Weed Risk Assessment Specialist, Charles Chimera, to receive insight on the potential risks that this species may have. Charles Chimera conducted a Weed Risk Assessment of *M. glomeratum* and came to the conclusion that this species is rated High Risk (C. Chimera, personal communication, October 11, 2023). This rating was based primarily on the species ability to spread both vegetatively and by seed (C. Chimera, personal communication, October 11, 2023). There is still uncertainty surrounding the negative effects *M. glomeratum* would have on O‘ahu, but the ideas that it would compete with native species and negatively impact the ecosystem can not be ruled out (C. Chimera, personal communication, October 11, 2023). Continued surveys in the future are necessary to determine the invasive capacity of this species. It is a high possibility that *M. glomeratum* would be found upstream to the site we surveyed as well as downstream to further reaches of the stream that are not currently accessible (C. Chimera, personal communication, October 11, 2023). Lower reaches of the stream are located behind private property lines and are currently inaccessible; access to these areas would be necessary in order to get a complete idea of the distribution of *M. glomeratum*. It is also possible that *M. glomeratum* is found in other streams around O‘ahu, making eradication of this species more complex. Continued surveys of the area as well as making the public aware of this species will help determine the effects of *M. glomeratum* on O‘ahu’s stream ecosystems.

References

Hemianthus glomeratus - Manatee Mudflower. Flowgrow. (2023). https://www.flowgrow.de/db/aquaticplants/hemianthus-glomeratus

Ross, M. (2023). *Manatee Mudflower*. iNaturalist. photograph. Retrieved July 27, 2023, from https://www.inaturalist.org/photos/288419995.

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