Jack Dempsey (*Rocio octofasciata*)

Ecological Risk Screening Summary

U.S. Fish and Wildlife Service, January 2026
Revised, March 2026
Web Version, 4/1/2026

Organism Type: Fish
Overall Risk Assessment Category: Uncertain

Photo: Michael Falk. Licensed under CC BY-NC 4.0. Available: https://www.inaturalist.org/photos/609870089 (March 2026).

1 Native Range and Status in the United States

Native Range

From Schmitter-Soto (2019):

"*Rocio octofasciata* is widely distributed across the Atlantic slope of Mexico and Central America. Native from Rio Chachalacas, Veracruz, Mexico, to Rio Ulúa, Honduras (Miller et al. 2005)."

Schimitter-Soto (2019) also reports *Rocio octofasciata* as native and extant in Tabasco, Yucatán, Campeche, Chiapas, and Quintana Roo, Mexico.

Froese and Pauly (2026) also report *Rocio octofasciata* as native to Belize and Guatemala.

Status in the United States

From Nico and Neilson (2026):

"**Status:** Locally established in South Dakota; established in Hawaii. In Florida, extirpated in Alachua County; unknown in other counties. Failed in California, Colorado, and Connecticut."

Additionally, Nico and Neilson (2026) report a failed introduction of *Rocio octofasciata* in Pennsylvania and occurrences with unknown establishment status in Utah.

From Lawson et al. (2017):

"Jack Dempsey has been observed in Florida public waters intermittently since the late 1960s (Shafland 1996; Fuller et al. 1999; FWC [2017]). Its documented history in Florida is unusual in that it has exhibited cycles of local establishment followed by declines and extirpation in several areas of peninsular Florida."

"Shafland (1996) moved the Jack Dempsey to a category of "possibly established" with the expectation that populations would not expand. This recategorization was a result of extensive sampling in Miami-Dade County that did not detect any Jack Dempsey (Loftus and Kushlan 1987; Shafland 1996; Hill 2003; Shafland et al. [2008]), and the lack of spread by the Alachua County and Satellite Beach populations. The status of Jack Dempsey was downgraded again by Shafland et al. ([2008]) to the category of "formerly reproducing" following evidence of further declines. In July of 2005 and December of 2006 the creek in Gainesville was re-sampled but zero Jack Dempsey specimens were observed, indicating this population may no longer exist (Shafland et al. [2008]; JE Hill, unpublished data). A formerly reproducing population in Palm Beach County has also declined and had not been detected since 1996 (Shafland et al. [2008]). A nearby population was discovered in 2013, but its status is uncertain (USGS [2017]). FWC [2017] currently lists Jack Dempsey as extirpated, and the USGS NAS currently lists it as extirpated in Alachua County and unknown in other counties. In contrast, new populations continue to be reported."

"Causes of their population declines are unknown and cold tolerance is unlikely to be a limiting factor (Dial and Wainright 1983) because less tolerant species like the Mayan Cichlid and Pike Killifish have persisted in the area (Table 3 [in source material])."

From Maddern (2018):

"*R. octofasciata* occurs in artificially heated lakes and waterbodies outside its latitudinal range […] In South Dakota, *R. octofasciata* is established in the Fall River, Hot Springs (Nico and Neilson, 2014)."

"The species is established on the island of Oahu, Hawaii (Devick, 1991)."

R. octofasciata is in trade within the United States (e.g., 1 Fish 2 Fish Dartmouth 2026, Aquatic Arts 2026).

Regulations

No species-specific regulations on possession or trade were found within the United States.

Means of Introductions within the United States

From Nico and Neilson (2026):

"**Means of Introduction:** Likely aquarium release in most cases, with the possibility of aquaculture escape in areas of Florida adjacent to current or former aquaculture production facilities."

Remarks

This ERSS was previously published in December 2019. Revisions were completed to incorporate new information and conform to updated standards.

Schmitter-Soto (2019) report *Rocio octofasciata* as present and origin uncertain in Costa Rica. However, Froese and Pauly (2026) report the species' occurrence in Costa Rica as questionable.

Mention of commercial products in this Ecological Risk Screening Summary does not entail endorsement by the U.S. Federal Government.

2 Biology and Ecology

Taxonomic Hierarchy and Taxonomic Standing

From Bailly (2017):

"Biota > Animalia (Kingdom) > Chordata (Phylum) > Vertebrata (Subphylum) > Gnathostomata (Superclass) > […] Actinopterygii (Class) > Perciformes (Order) > Labroidei (Suborder) > Cichlidae (Family) > Cichlinae (Subfamily) > *Rocio* (Genus) > *Rocio octofasciata* (Species)"

According to Fricke et al. (2026), *Rocio octofasciata* (Regan 1903) is the current valid name for this species.

The following synonyms of *Rocio octofasciata* from Fricke et al. (2026) were used to search for information for this report*: Cichlasoma octofasciatum*, *Cichiosoma biocellatum, Archocentrus octofasciatus,* and *Heros octofasciatus*. The following synonym from ITIS (2026) was also used for this report: *Cichlasoma octofasciata*.

Size, Weight, and Age Range

From Froese and Pauly (2026):

"Max length : 25.0 cm TL [total length] male/unsexed; [Page and Burr 1991]; common length : 7.5 cm TL male/unsexed; [Hugg 1996]"

From Maddern (2019):

"In the wild, *R. octofasciata* may live for 3-4 years and, in aquaria, the species is reported to live 8-15 years (Texas Parks and Wildlife, 2012)."

Environment

From Froese and Pauly (2026):

"Freshwater; benthopelagic; pH range: 7.0 - 8.0; dH range: 9 - 20. […]; 22°C - 30°C [assumed as water temperatures in captivity; Conkel 1993]; […]"

From Maddern (2019):

"Within its natural range, *R. octofasciata* occurs in wetlands (Froese and Pauly, 2014) and particularly slow moving waters of lower river valleys on the coastal plains (Conkel, 1993)."

"It appears that *R. octofasciata* has only established viable introduced populations in highly anthropogenically-modified habitats, such as drainage canals and rock quarries, and has not been successfully introduced to less modified habitats with stable native aquatic communities. Although the species is euryhaline [able to tolerate ranges of salinity in the water; Oldfield 2004; NSW 2014], it does not appear to occupy saline or brackish waters, or estuarine environments, as an introduced species."

"Escalera-Vázquez and Zambrano (2010) documented *R. octofasciata* moving between permanent and ephemeral water bodies. During the wet season, the species migrated from deeper permanent ponds to shallow ephemeral pools, only to return to the permanent refugia during the dry season."

"*R. octofasciata* occurs in artificially heated lakes and waterbodies outside its latitudinal range […]."

Climate

From Froese and Pauly (2026):

"Tropical; […]; 21°N - 14°N"

Distribution Outside the United States

Native

From Schmitter-Soto (2019):

"*Rocio octofasciata* is widely distributed across the Atlantic slope of Mexico and Central America. Native from Rio Chachalacas, Veracruz, Mexico, to Rio Ulúa, Honduras (Miller et al. 2005). "

Schimitter-Soto (2019) also reports *Rocio octofasciata* as native and extant in Tabasco, Yucatán, Campeche, Chiapas, and Quintana Roo, Mexico.

Froese and Pauly (2026) also report *Rocio octofasciata* as native to Belize and Guatemala.

Introduced

From Maddern (2018):

"In Australia, *R. octofasciata* was collected from the cooling ponds of a power station (Hazelwood) in Victoria in the late 1970s, although the population was not self-sustaining (Cadwallader et al., 1980). A population was discovered in early 2004 at Yamba, north coast of New South Wales, Australia [NSW 2014]. This population is confined to an isolated flooded quarry locally known as the 'green pool'. Three failed eradication attempts using explosives were carried out between September 2004 and June 2005."

"*R. octofasciata* is well established in Lake Staraya Kuban, Krasnodar, Russia and has been present at this location since at least the 1980s (Pashkov and Zworykin, 2009; Zworykin and Pashkov, 2010). Lake Staraya Kuban is an oxbow lake of the Kuban River and is used as a cooling water body of the "Krasnodar Thermal and Electric Power Plant". The species occupies areas of the lake with water temperatures up to 26°C (Pashkov and Zworykin, 2009)."

From Piyakarnchana (1989):

"[…] Jack Dempsey (*Cichiosoma biocellatum* [synonym of *Rocio octofasciata*]) were first imported [to Thailand] from South American countries (Paraguay, Bolivia and Argentina) and in 1950s reintroduced from Hongkong and Japan. They breed successfully in the natural habitats of Thailand."

Froese and Pauly (2026) report *Rocio octofasciata* as introduced to the Philippines with an unknown establishment status.

Means of Introduction Outside the United States

From Maddern (2018):

"The release of unwanted ornamental fishes is the most likely explanation for the presence of nonindigenous populations of *R. octofasciata* in Australia and elsewhere (Lintermans, 2004; Nico and Neilson, 2014)."

Short Description

From Froese and Pauly (2026):

"Dorsal spines (total): 17 - 19; Dorsal soft rays (total): 8-10; Anal spines: 8-9; Anal soft rays: 7 - 9. This species has spots on sides smaller than scales, aligned in about 15 regular series (vs. not clearly aligned); abdomen predominantly whitish or greyish in life (similar to *R. gemmata*, vs. reddish in *R. ocotal*; ventral angle of articular is acute (vs. right); the first neural spine oriented rostrad (vs. caudad); circumpeduncular scales as few as 17 (vs. always more than 19); distance from the caudal esophageal loop in gut to esophagus always greater than 24% gut length (vs. less than 16%) [Schmitter-Soto 2007]. There are no unique autapomorphies."

Biology

From Froese and Pauly (2026):

"Occurs in swampy areas with warm, murky water. Found in weedy, mud-bottomed and sand-bottomed canals and drainage ditches [Page and Burr 1991]. Prefers coastal plains and slow moving waters of the lower river valleys [Conkel 1993]. Feeds on worms, crustaceans, insects and fish [Mills and Vevers 1989]."

From Maddern (2018):

"*R. octofasciata* is a biparental substrate spawner/brooder (Lee et al., 1980; Seriously Fish, 2014), which exhibits a separation of parental roles (Zworykin, 1995; Zworykin et al., 1998). Typically, female *R. octofasciata* primarily guard the eggs until they hatch, and fry are guarded by male fish (Zworykin et al., 1998). Parental fin digging in the substrate is performed significantly more often by females than males. It has been suggested that fin digging stirs the substrate and provides small particles of food for the fry to consume. Both parents increase the frequency of fin digging significantly with an increase in fry age, particularly from 3 to 10 days (Zworykin, 1998). While *R. octofasciata* parents incubate eggs and guard young, they are likely to undertake aggressive behaviour towards con- and heterospecifics (Froese and Pauly, 2014). Fecundity is 500 to 800 eggs per spawning (Riehl and Baensch, 1991). […] In aquaria, eggs hatch in 3 days at 26.6°C and fry become free-swimming in 3 days (Texas Parks and Wildlife, 2012). *R. octofasciata* will reach maturity in less than a year and can undertake multiple spawning per year (Froese and Pauly, 2014). Fishes of this species with an 'equilibrium life-history strategy' exhibit parental care, prolonged breeding seasons and live in deeper and more stable habitats, such as slow-flowing ponds, river channels and lakes (Winemiller, 1989; Escalera-Vázquez and Zambrano, 2010)."

"It has a relatively high tolerance to hypoxic conditions and undertakes aquatic surface respiration when exposed to extremely low oxygen concentrations (<5 mm Hg) (Obordo and Chapman, 1997). Other well developed physiological mechanisms, including a low metabolic rate and large gills relative to body size, also aid the species in hypoxic conditions (Obordo and Chapman, 1997)."

“Hinojosa-Garro et al. (2013) determined the diet of *R. octofasciata* from permanent and semi-permanent pools in Petenes Biosphere Reserve, Yucatán Peninsula, Mexico. The species was found to be principally detritivorous in permanent pools, and omnivorous in semi-permanent pools, consuming a higher proportion of terrestrial insects and arachnids in the latter habitat. At the same time, the species can be described as predominantly predatory in a creek at the University of Florida, Alachua County, Florida (Jennings, 1986).”

Human Uses

From Maddern (2018):

“Although *R. octofasciata* is a popular ornamental fish species, it is not ideal for many hobbyists due to its large size (up to 25 cm) and aggressive nature. The species will also opportunistically consume smaller fishes. Thus, it is not ideal to keep it in the standard “community” aquarium with many different, and often small, fish species. It may outgrow small aquaria, attack and/or consume other smaller aquarium fish species, which promotes its disposal.”

“In Australia, Corfield et al. (2007) listed this species as of “medium” importance as an ornamental fish, with a volume of up to 10,000 fish sold annually.”

“*R. octofasciata* is used as a biological research model in many disciplines, e.g. behavioural research (e.g. Zworykin et al., 1998).”

From Pashkov and Zvorykin (2009):

“The American cichlid fish [*Rocio octofasciata*] has been inhabiting Lake Staraya Kuban (the city of Krasnodar [Russia]) for over 25 years and has become so numerous that it serves as an item of amateur fishery.”

Diseases

No information was found associating *Rocio octofasciata* with any diseases listed by the World Organisation for Animal Health (2026).

Poelen et al. (2014) lists *Campechetrema herrerai*, *Acanthostomum astorquii*, *Ascocotyle nunezae*, *Neoechinorhynchus golvani*, *Ascocotyle felippei*, *Crocodilicola pseudostoma*, *Crassicutis cichlasomae*, *Genarchella isabellae*, *Homalometron pallidum*, *Oligogonotylus manteri*, *Pelaezia loossi*, *Perezitrema bychowskyi*, *Sciadicleithrum bravohollisae*, *Posthodiplostomum minimum*, *Sciadicleithrum mexicanum*, *Ascocotyle nana*, and *Sciadicleithrum mexicanum* as parasites of *Rocio octofasciata*. Poelen et al. (2014) lists *Neocapillaria pterophylli* as an endoparasite and *Gyrodactylus mojarrae* as a pathogen of *Rocio octofasciata.*

Froese and Pauly (2026) also list the following diseases for *Rocio octofasciata*: White spot Disease, Yellow Grub, *Spiroxys* Infestation, *Contracaecum* Disease (larvae), *Cladocystis* Infection, *Diplostomum* Infection, *Ribeiroia* Infection, Tetarcotyla Infection, *Uvulifer* Infection, *Falcaustra* Infection (*Falcaustra* sp.), *Capillaria* Infestation 4.

From Mendoza-Palmero et al. (2017):

“Based on an integrative taxonomic approach, combining morphological characters and partial sequences of the 28S rRNA gene, a new genus and species, *Parasciadicleithrum octofasciatum*, is proposed to accommodate dactylogyrids infecting the gills of *Rocio octofasciata* (Cichlidae) from a tributary of the Lacantún River basin, Chiapas State, southern Mexico.”

Threat to Humans

From Froese and Pauly (2026):

“Harmless”

3 Impacts of Introductions

The following quotations detail potential, anecdotal, or highly generalized information on impacts of introduction from *Rocio octofasciata*.

From Maddern (2018):

“Potential ecological impacts include predation and resource competition upon endemic fish fauna, and predation of aquatic invertebrate communities in general.”

“Little information is available on the impacts of introduced populations of *R. octofasciata*, although generalisations can be made regarding the diet and behaviour of the species. *R. octofasciata* may compete with indigenous fishes for food and will opportunistically consume smaller fishes. The aggressive behaviour of *R. octofasciata* may displace indigenous fishes.”

“Texas Parks and Wildlife (2012) identified North American native sunfishes (Centrarchidae) as potential competitors of *R. octofasciata*. The introduced cichlid occupies a similar ecological niche as sunfishes, having similar reproduction habits (sunfishes are substrate spawners and nest builders, with males guarding the nest), trophic position (adults eat insects, larvae and small fish) and habitat (slow waters, muddy bottoms, high vegetation cover).”

4 History of Invasiveness

The History of Invasiveness for *Rocio octofasciata* is classified as Data Deficient. Multiple nonnative introductions of *Rocio octofasciata* have resulted in established populations in the United States, Russia, Thailand, and Australia. However, information on the ecological impacts of these introductions remains largely unknown. Existing concerns regarding the potential for impacts largely center on the species’ omnivorous, opportunistic feeding behavior and its potential to compete with native species.

5 Global Distribution

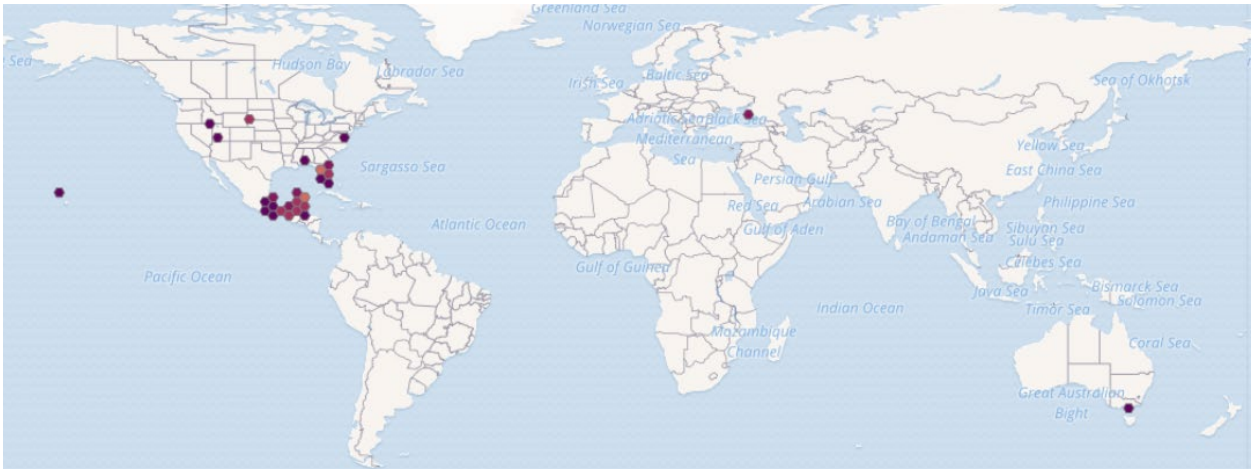

Figure 1. Known global distribution of *Rocio octofasciata*. Map from GBIF Secretariat (2023). Locations are in Central and North America, Hawaii, Russia, and Australia. The observations of *Rocio octofasciata* in Utah, Nevada, and Maryland in the United States were not found to represent established populations, therefore these observations were not used in the climate matching analysis. The reported occurrences in Krasnodar, Russia and in Victoria, Australia are located within the thermal outflows of power plants and were not used to select source points for the climate match as the climate matching model cannot account for those thermal discrepancies (Sanders et al. 2023).

The location of an established population in New South Wales, Australia was given in Maddern (2018) and was used in the climate matching analysis.

No georeferenced observations representing the reported established population in Thailand (Piyakarnchana 1989) were found.

6 Distribution Within the United States

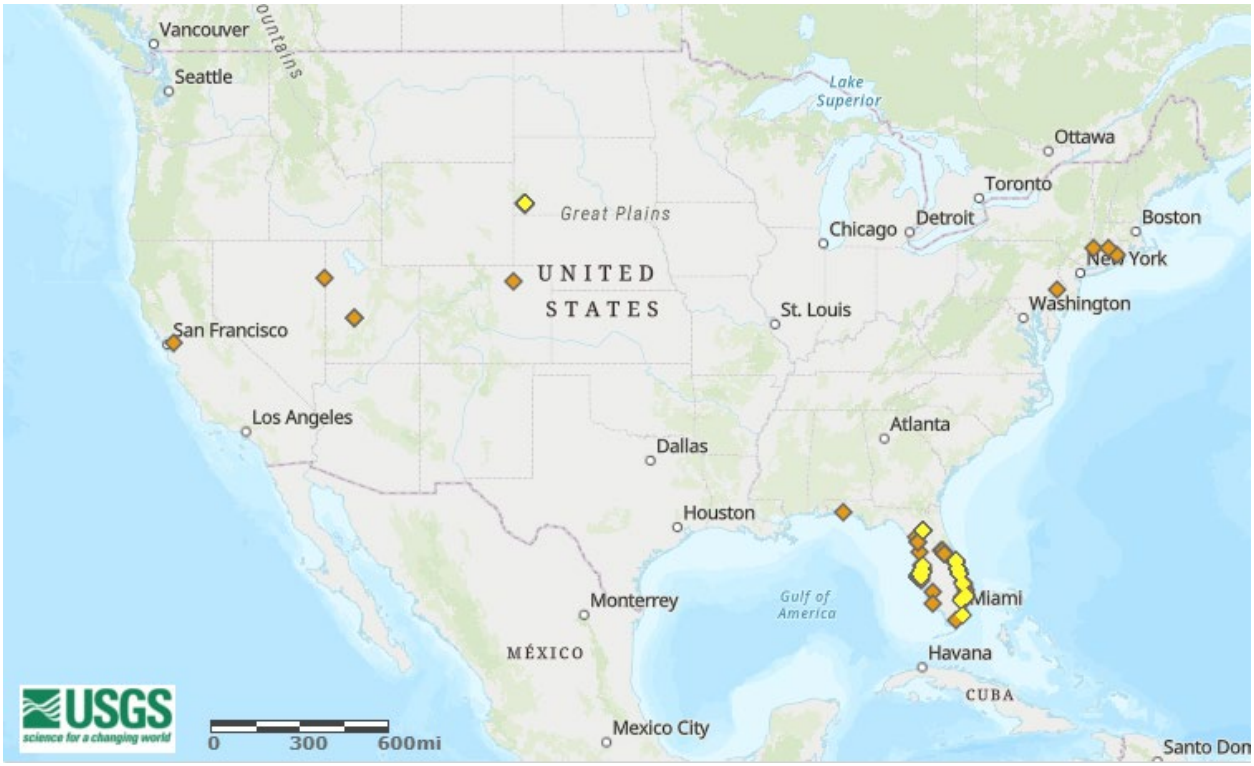

Figure 2. Map of the contiguous United States showing known locations where *Rocio octofasciata* has been reported. Map from Nico and Neilson (2026). Reported locations are in California, Colorado, Connecticut, Florida, Pennsylvania, South Dakota, and Utah. Observations indicated with a yellow diamond represent established populations. Observations indicated by orange diamonds represent failed, eradicated, or unknown establishment statuses. Only observations representing established populations were used in the climate matching analysis. The exception was the established population in South Dakota. This population is located in geothermally heated waters, and the climate matching model cannot account for thermal discrepancies (Sanders et al. 2023).

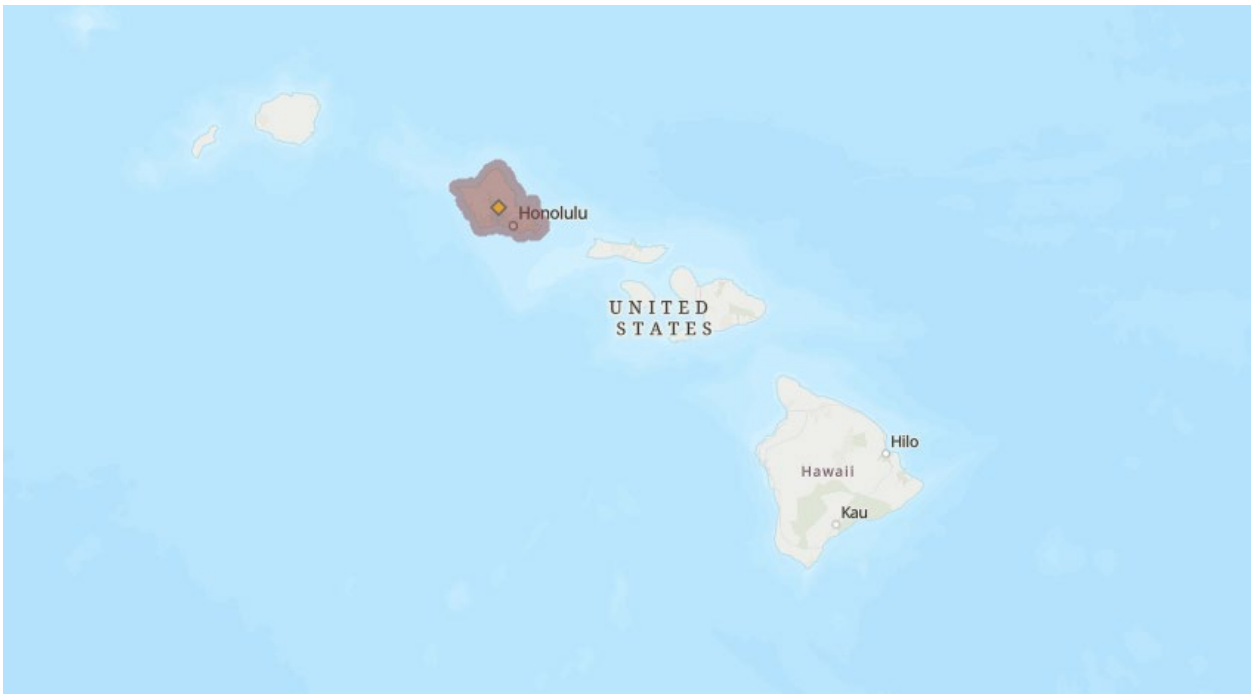

Figure 3. Known distribution of *Rocio octofasciata* in Hawaii. Map from Nico and Neilson (2026). This observation represents an established population and was used in the climate matching analysis.

7 Climate Matching

Summary of Climate Matching Analysis

The climate matching analysis for *Rocio octofasciata* to the contiguous United States found areas of high match in peninsular Florida and the southern Atlantic Coast. There were some small, scattered areas of high match along the Gulf Coast. Medium climate match was found in the coastal plain of the Southeast, and from Texas to the southern Great Lakes. Small areas of medium match were found in the Pacific and Desert Southwest. The overall Climate 6 score (Sanders et al. 2023; 16 climate variables; Euclidean distance) for the contiguous United States was 0.092, indicating that Yes, there is establishment concern for this species. The Climate 6 score is calculated as: (count of target points with scores ≥ 6)/(count of all target points). Establishment concern is warranted for Climate 6 scores greater than or equal to 0.002 based on an analysis of the establishment success of 356 nonnative aquatic species introduced to the United States (USFWS 2024). This climate matching analysis may be an underrepresentation of where the species may actually be able to establish as it is known to become established in thermally regulated waters that deviate from ambient conditions. The climate matching model cannot account for thermal discrepancies (Sanders et al. 2023).

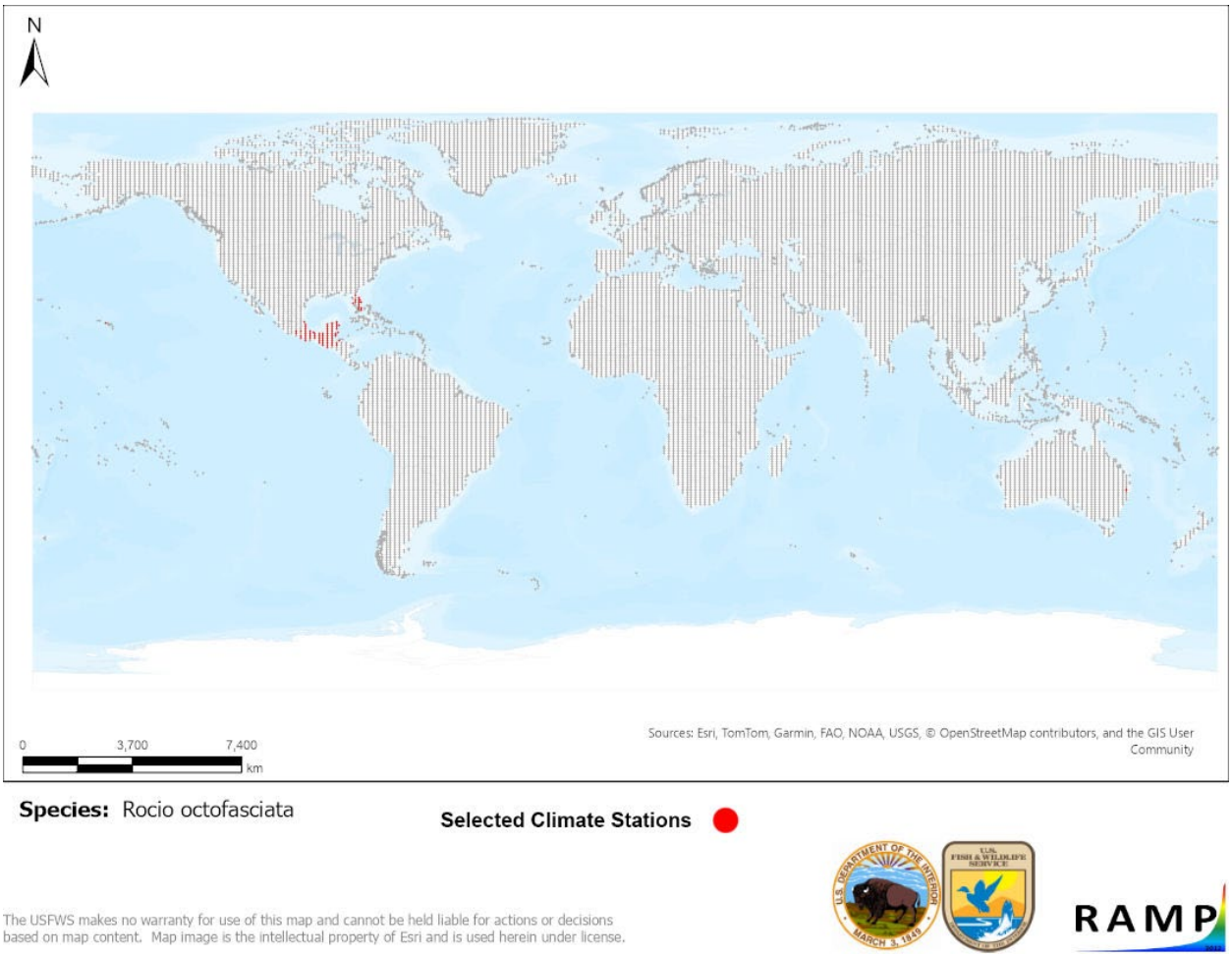

Figure 4. RAMP (Sanders et al. 2023) source map of the world showing weather stations selected as source locations (red; Australia, Belize, Guatemala, Honduras, Mexico, and United States) and non-source locations (gray) for *Rocio octofasciata* climate matching. Source locations from Maddern (2018) and GBIF Secretariat (2023). Selected source locations are within 100 km of one or more species occurrences, and do not necessarily represent the locations of occurrences themselves.

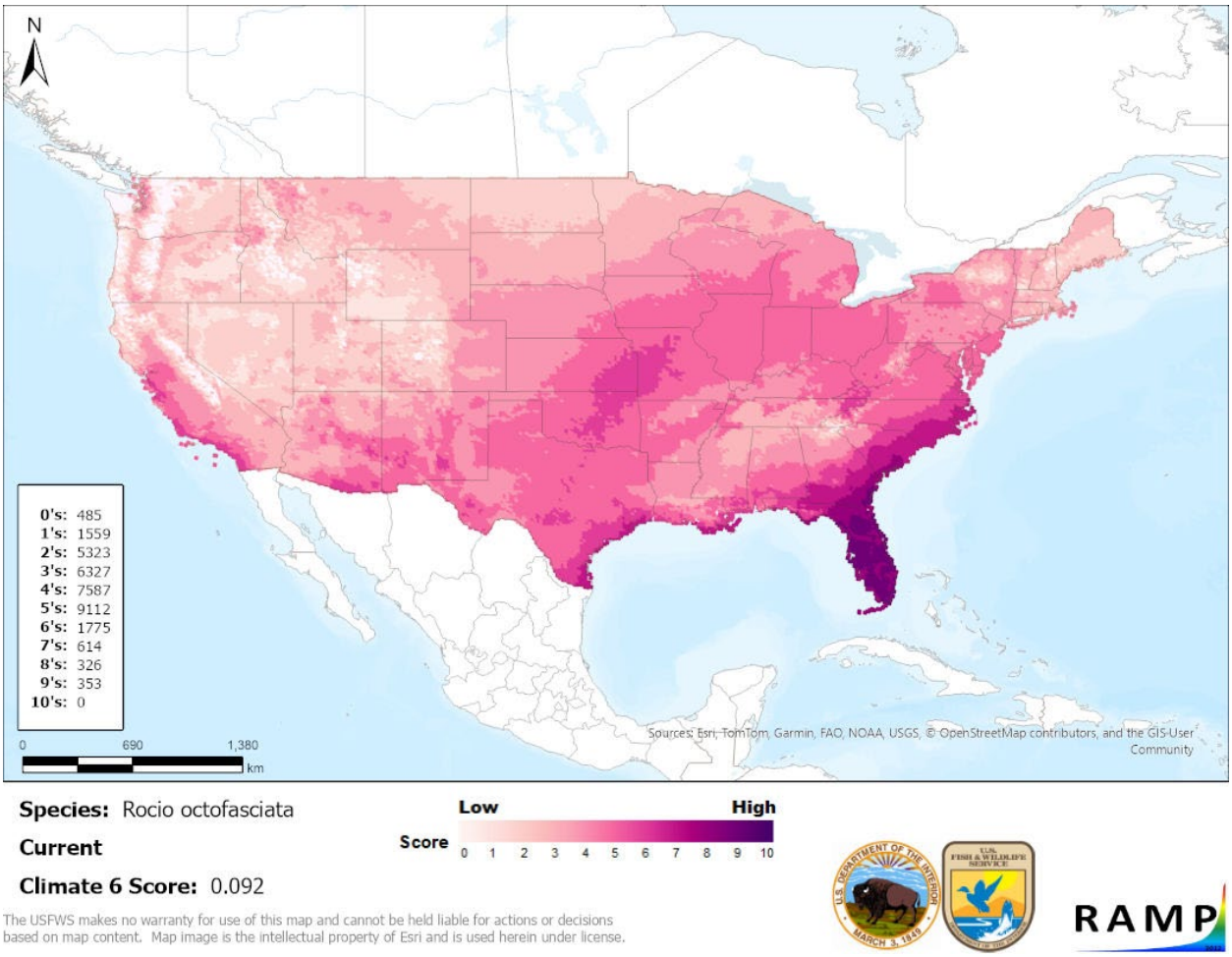

Figure 5. Map of RAMP (Sanders et al. 2023) climate matches for *Rocio octofasciata* in the contiguous United States based on source locations reported by Maddern (2018) and GBIF Secretariat (2023). Counts of climate match scores are tabulated on the left. 0/Pale Pink = Lowest match, 10/Dark Purple = Highest match.

8 Certainty of Assessment

The certainty of the assessment for *Rocio octofasciata* is Low. While information is available on its biology and distribution, evidence regarding the impact of introduced populations is limited. Although introductions of *R. octofasciata* have been documented, there is no scientific literature that supports the direct impacts of those introductions. The climate matching analysis may be an underrepresentation of where the species can establish due to its ability to establish in thermally regulated waters.

9 Risk Assessment

Summary of Risk to the Contiguous United States

Rocio octofasciata, Jack Dempsey, is a freshwater fish native to Mexico and Central America as far south as Honduras. It is an opportunistic omnivore and exhibits some tolerance to a range of

environmental conditions. This species is known to be in trade in the United States and internationally. No regulations specific to this species were identified in the United States. *R. octofasciata* is established in Florida, Hawaii, and South Dakota. It has also been introduced to and established populations in Australia, Russia, and Thailand. In South Dakota, as well as in Russia and southern Australia, *R. octofasciata* has become established in thermally regulated waters. The History of Invasiveness for *R. octofasciata* is classified as Data Deficient due to limited evidence documenting impacts of its introduction. Climate match analysis for the contiguous United States indicates that yes, there is establishment concern. Areas with a high climate match include peninsular Florida and the southern Atlantic Coast. The Certainty of Assessment for this ERSS is classified as Low, as no scientific literature currently provides evidence of impacts, or lack of impacts, resulting from introduction. The Overall Risk Assessment Category for *Rocio octofasciata* in the contiguous United States is Uncertain.

Assessment Elements

- **History of Invasiveness (see Section 4): Data Deficient**
- **Establishment Concern (see Section 7): Yes**
- **Certainty of Assessment (see Section 8): Low**
- **Remarks, Important additional information: Can establish in thermally regulated waters.**
- **Overall Risk Assessment Category: Uncertain**

10 Literature Cited

Note: The following references were accessed for this ERSS. References cited within quoted text but not accessed are included below in section 11.

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11 Literature Cited in Quoted Material

Note: The following references are cited within quoted text within this ERSS, but were not accessed for its preparation. They are included here to provide the reader with more information.

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Appendix

Summary of Future Climate Matching Analysis

Future climate projections represent two Shared Socioeconomic Pathways (SSP) developed by the Intergovernmental Panel on Climate Change (IPCC 2021): SSP5, in which emissions triple by the end of the century; and SSP3, in which emissions double by the end of the century. Future climate matches were based on source locations reported by Maddern (2018) and GBIF Secretariat (2023).

Under the future climate scenarios (figure A1), on average, climate matching to the contiguous United States found high climate match for *Rocio octofasciata* was projected to occur in the Southern Atlantic Coast and Southern Florida. Areas of low climate match were projected to occur in the Great Basin, Northern Pacific Coast, and Western Mountains regions. The Climate 6 scores for the individual future scenario models (figure A2) ranged from a low of 0.053 (model: UKESM1-0-LL, SSP5, 2085) to a high of 0.191 (model: MRI-ESM2-0, SSP3, 2055). All future scenario Climate 6 scores were above the Establishment Concern threshold, indicating that Yes, there is establishment concern for this species under future scenarios. The Climate 6 score for the current climate match (0.092, figure 5) falls within the range of scores for future projections. The time step and climate scenario with the most change relative to current conditions was SSP5, 2085, the most extreme climate change scenario. Primarily under the 2085 scenarios, areas within the Colorado Plateau, Great Lakes, Northern Pacific Coast, and Western Mountains saw a moderate increase in the climate match relative to current conditions. No large increases were observed regardless of time step and climate scenarios. Also primarily under the 2085 scenarios, areas within the Gulf Coast, Southeast, Southern Atlantic Coast, and Southern Florida saw a moderate decrease in the climate match relative to current conditions. No large decreases were observed regardless of time step and climate scenarios. Additional very small areas of large or moderate change may be visible on the maps (figure A3).

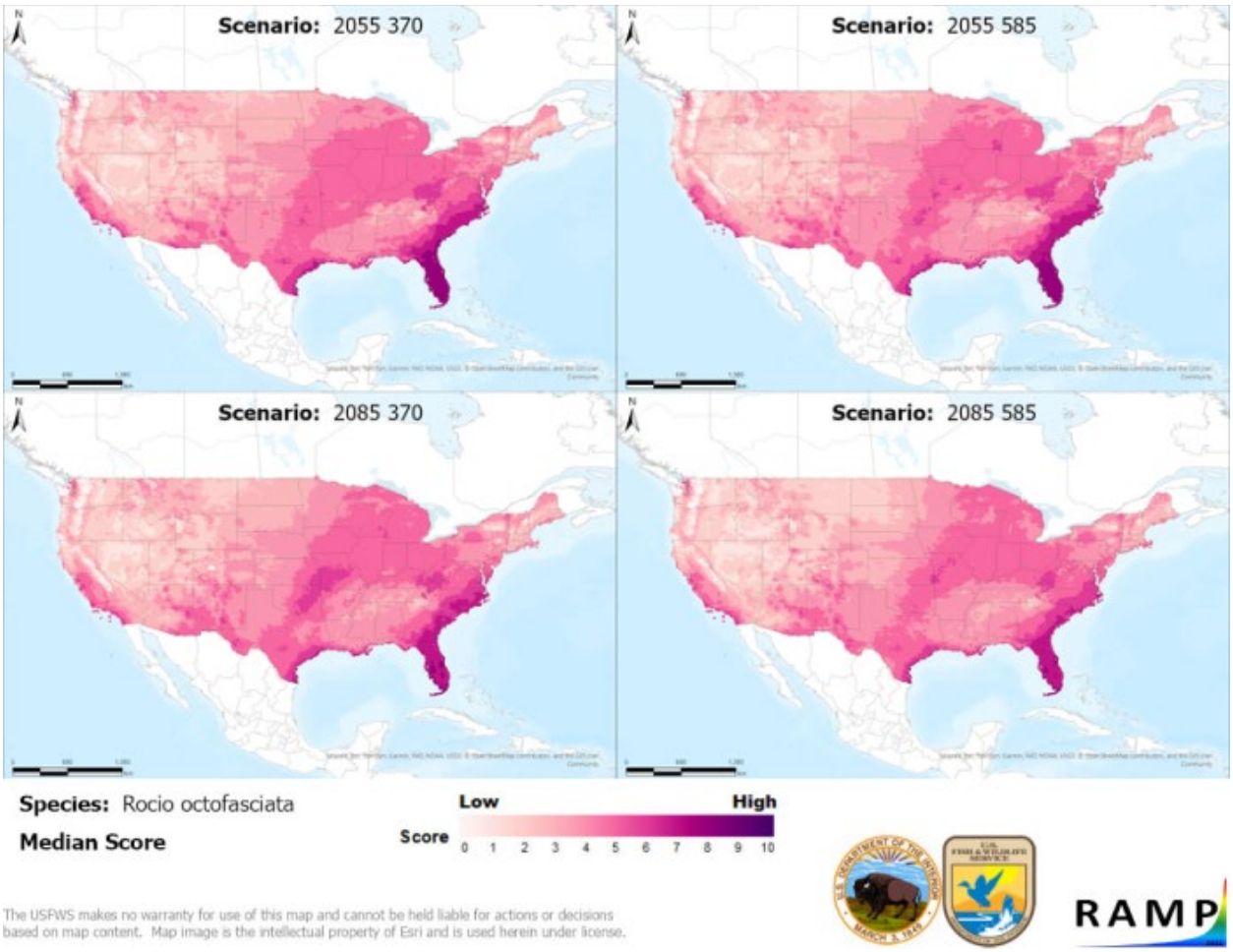

Figure A1. Maps of median RAMP (Sanders et al. 2023) climate matches projected under potential future climate conditions using five global climate models for *Rocio octofasciata* in the contiguous United States. Climate matching is based on source locations reported by Maddern (2018) and GBIF Secretariat (2023). Shared Socioeconomic Pathways (SSPs) used (from left to right): SSP3, SSP5 (IPCC 2021). Time steps: 2055 (top row) and 2085 (bottom row). Climate source data from CHELSA (Karger et al. 2017, 2018); global climate models used: GFDL-ESM4, UKESM1-0-LL, MPI-ESM1-2-HR, IPSL-CM6A-LR, and MRI-ESM2-0. 0/Pale Pink = Lowest match, 10/Dark Purple = Highest match.

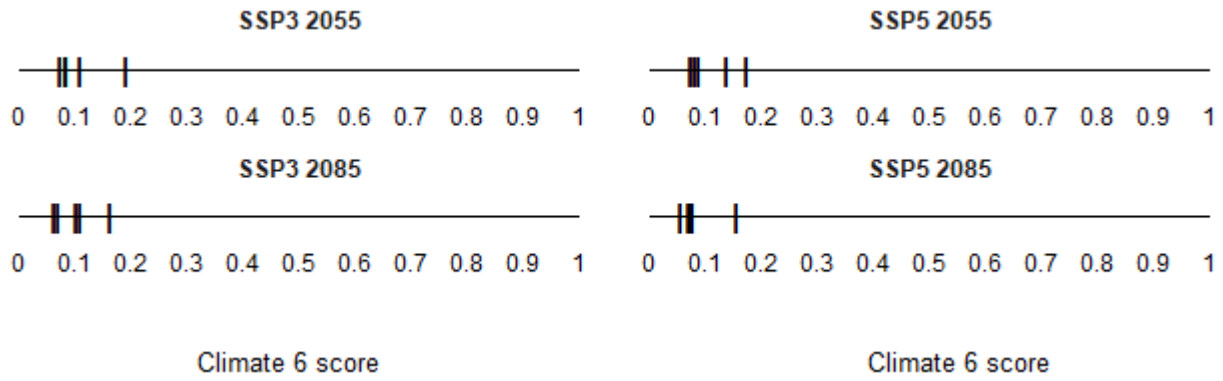

Figure A2. Comparison of projected future Climate 6 scores for *Rocio octofasciata* in the contiguous United States for each of five global climate models under four combinations of Shared Socioeconomic Pathway (SSP) and time step. SSPs used (from left to right): SSP3, SSP5 (Karger et al. 2017, 2018; IPCC 2021). Time steps: 2055 (top row) and 2085 (bottom row). Climate source data from CHELSA (Karger et al. 2017, 2018); global climate models used: GFDL-ESM4, UKESM1-0-LL, MPI-ESM1-2-HR, IPSL-CM6A-LR, and MRI-ESM2-0.

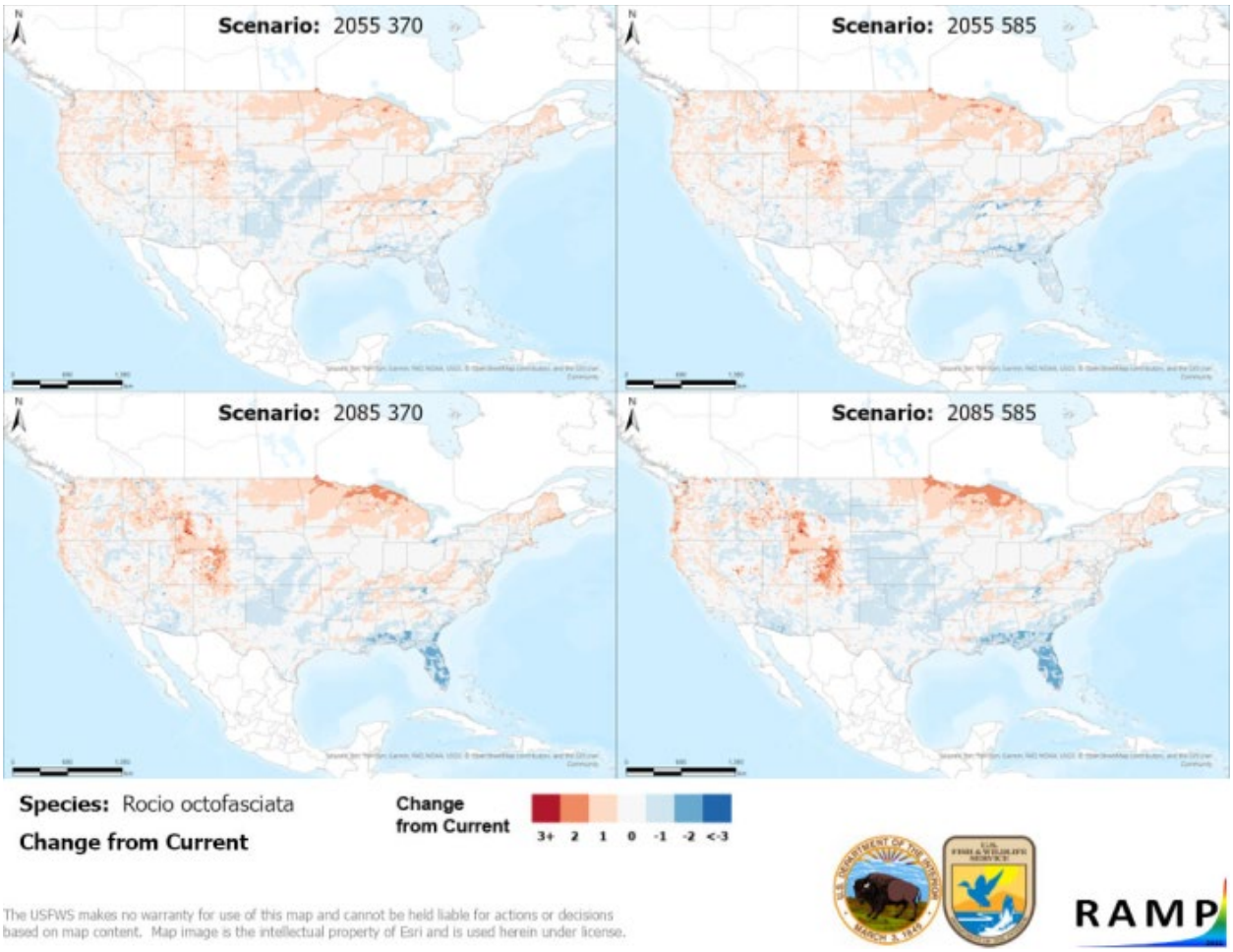

Figure A3. RAMP (Sanders et al. 2023) maps of the contiguous United States showing the difference between the current climate match target point score (figure 5) and the median target point score for future climate scenarios (figure A1) for *Rocio octofasciata* based on source locations reported by Maddern (2018) and GBIF Secretariat (2023). Shared Socioeconomic Pathways (SSPs) used (from left to right): SSP3, SSP5 (IPCC 2021). Time steps: 2055 (top row) and 2085 (bottom row). Climate source data from CHELSA (Karger et al. 2017, 2018); global models used: GFDL-ESM4, UKESM1-0-LL, MPI-ESM1-2-HR, IPSL-CM6A-LR, and MRI-ESM2-0. Shades of blue indicate a lower target point score under future scenarios than under current conditions. Shades of red indicate a higher target point score under future scenarios than under current conditions. Darker shades indicate greater change.

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