Blackline Hawaiian Damselfly
(Megalagrion nigrohamatum nigrolineatum)

5-Year Review
Summary and Evaluation

U.S. Fish and Wildlife Service
Pacific Islands Fish and Wildlife Office
Honolulu, Hawai‘i

5-YEAR REVIEW

Species reviewed: Blackline Hawaiian damselfly (*Megalagrion nigrohamatum nigrolineatum*)

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1.0 GENERAL INFORMATION

1.1 Reviewers

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Cooperating Field Office(s):
N/A

Cooperating Regional Office(s):
N/A

1.2 Methodology used to complete the review:

This review was conducted by staff of the Pacific Islands Fish and Wildlife Office of the U.S. Fish and Wildlife Service (USFWS), beginning on October 2, 2018. The review is based on the final rule to list the blackline Hawaiian damselfly, the recovery outline for the island of O‘ahu signed on July 26, 2018, current published and unpublished materials, and expert opinions and knowledge on the *Megalagrion nigrohamatum nigrolineatum* species. The draft 5-year review was then reviewed by the Animal Recovery Coordinator and the Conservation and Restoration Team Manager before signature by the Field Supervisor.

1.3 Background:

1.3.1 FR Notice citation announcing initiation of this review:

[USFWS] U.S. Fish and Wildlife Service. 2017. Endangered and threatened wildlife and plants; initiation of 5-year status reviews for 138 species in Hawai‘i, Oregon, Washington, and California. Federal Register 82 (75): 18665–18668.

1.3.2 Listing history

Original Listing
FR notice: [USFWS] U.S. Fish and Wildlife Service. 2012. Endangered status for 23 species on O‘ahu and designation of critical habitat for 124 species; final rule. Federal Register 77 (181): 57648-57862.
Date listed: September 18, 2012
Entity listed: Species
Classification: Endangered

Revised Listing, if applicable
FR notice: N/A
Date listed: N/A
Entity listed: N/A
Classification: N/A

1.3.3 Associated rulemakings: N/A

1.3.4 Review History: N/A

1.3.5 Species' Recovery Priority Number at start of this 5-year review: 6

1.3.6 Current Recovery Plan or Outline

[USFWS] U.S. Fish and Wildlife Service. 2018. Recovery outline for the island of O‘ahu. U.S. Fish and Wildlife Service, Pacific Islands Fish and Wildlife Office, Honolulu, Hawai‘i. 42 pp.
https://www.fws.gov/pacific/ecoservices/endangered/recovery/documents/Oahu_Recovery_Outline_20180726.pdf
Name of plan or outline: Recovery outline for the island of O‘ahu
Date issued: July 2018
Dates of previous revisions, if applicable: N/A

2.0 REVIEW ANALYSIS

2.1 Application of the 1996 Distinct Population Segment (DPS) policy

2.1.1 Is the species under review a vertebrate?

_____ ***Yes***
__X_ ***No***

2.1.2 Is the species under review listed as a DPS?

____ ***Yes***
_X__ ***No***

2.1.3 Was the DPS listed prior to 1996?

____ ***Yes***
____ ***No***

2.1.3.1 Prior to this 5-year review, was the DPS classification reviewed to ensure it meets the 1996 policy standards?

____ ***Yes***
____ ***No***

2.1.3.2 Does the DPS listing meet the discreteness and significance elements of the 1996 DPS policy?

____ ***Yes***
____ ***No***

2.1.4 Is there relevant new information for this species regarding the application of the DPS policy?

____ ***Yes***
__X__ ***No***

2.2 Recovery Criteria

2.2.1 Does the species have a final, approved recovery plan containing objective, measurable criteria?

____ ***Yes***
__X__ ***No***

2.2.2 Adequacy of recovery criteria.

2.2.2.1 Do the recovery criteria reflect the best available and most up-to date information on the biology of the species and its habitat?

____ ***Yes***
____ ***No***

2.2.2.2 Are all of the 5 listing factors that are relevant to the species addressed in the recovery?

____ ***Yes***
____ ***No***

2.2.3 List the recovery criteria as they appear in the recovery plan, and discuss how each criterion has or has not been met, citing information:
No final recovery plan for *Megalagrion nigrohamatum nigrolineatum* has been developed by the time of the completion of this 5-year review.

2.3 Updated Information and Current Species Status

2.3.1 Biology and Habitat

2.3.1.1 New information on the species' biology and life history:
No new information on the blackline Hawaiian damselfly (*Megalagrion nigrohamatum nigrolineatum)* biology or life history has become known since the species was listed. The blackline Hawaiian damselfly occurs in the slow sections or pools along midreach and headwater sections of perennial upland streams and in seep-fed pools along overflow channels bordering such streams. Naiads remain concealed and are found under stones or in mats of algae (Williams, 1936, p. 318; Zimmerman, 1948a, pp. 371-372).

2.3.1.2 Abundance, population trends (e.g. increasing, decreasing, stable), demographic features (e.g., age structure, sex ratio, family size, birth rate, age at mortality, mortality rate, etc.), or demographic trends:
Little is known about the abundance, population trends, and demographic features of the blackline Hawaiian damselfly. Between 1991 and 2003, over 150 sites were surveyed on the island of Oʻahu for native damselflies (Polhemus, 2007, pp. 233-235). The blackline Hawaiian damselfly was known historically from the Koʻolau and Waiʻanae Mountains, from sea level to over 2,400 ft (730 m) (Williams, 1936, p. 318; Polhemus, 1994a, pp. 6-12). Currently, this species is found in the lowland wet ecosystem on the windward and leeward sides of the Koʻolau Mountains, in the headwaters and upper reaches of 17 streams: Koloa, Kaipapaʻu, Maʻakua, upper Kaluanui, Palaa, Helemano headwaters, Poamoho, Kahana, Waiāhole, Waiawa, Kaʻalaea, Waiheʻe, Kahaluʻu, north Hālawa, Heʻeia, Kalihi, and Maunawili (TNC, 2007; Polhemus, 2008a, *in litt*.: Wolff, 2008, *in litt*.; HBMP, 2008; Preston, 2011, *in litt*.) All colonies of the blackline Hawaiian damselfly are constrained to portions of streams not occupied by nonnative predatory fish, that is, stream portions above geologic or manmade barriers (e.g., waterfalls, steep gradients, dry stream midreaches, or constructed diversions). At the time when the final listing rule was being written (2012), the 17 stream colonies were estimated to total 800 to 1000 individuals, with approximately 50 individuals per stream (Polhemus, 2008c, *in litt*.). No current estimates of population size for the blackline Hawaiian damselfly are available.

2.3.1.3 Genetics, genetic variation, or trends in genetic variation (e.g., loss of genetic variation, genetic drift, inbreeding, etc.):
Apparent limits of the current blackline Hawaiian damselfly population will likely reduce genetic diversity and cause inbreeding depression.

2.3.1.4 Taxonomic classification or changes in nomenclature:
No changes in taxonomic classification have occurred.

2.3.1.5 Spatial distribution, trends in spatial distribution (e.g. increasingly fragmented, increased numbers of corridors, etc.), or historic range (e.g. corrections to the historical range, change in distribution of the species' within its historic range, etc.):
Between 1991 and 2003, over 150 sites were surveyed on the island of Oʻahu for native damselflies (Polhemus, 2007, pp. 233-235). The blackline Hawaiian damselfly was known historically from the Koʻolau and Waiʻanae Mountains, from sea level to over 2,400 ft (730 m) (Williams, 1936, p. 318; Polhemus, 1994a, pp. 6-12). Currently, this species is found in the lowland wet ecosystem on the windward and leeward sides of the Koʻolau Mountains, in the headwaters and upper reaches of 17 streams: Koloa, Kaipapaʻu, Maʻakua, upper Kaluanui, Palaa, Helemano headwaters, Poamoho, Kahana, Waiāhole, Waiawa, Kaʻalaea, Waiheʻe, Kahaluʻu, north Hālawa, Heʻeia, Kalihi, and Maunawili (TNC, 2007; Polhemus, 2008a, *in litt*.: Wolff, 2008, *in litt*.; HBMP, 2008; Preston, 2011, *in litt*.) All colonies of the blackline Hawaiian damselfly are constrained to portions of streams not occupied by nonnative predatory fish, that is, stream portions above geologic or manmade barriers (e.g., waterfalls, steep gradients, dry stream midreaches, or constructed diversions). At the time when the final listing rule was being written (2012), the 17 stream colonies were estimated to total 800 to 1000 individuals, with approximately 50 individuals per stream (Polhemus, 2008c, *in litt*.).

Recent observations include sightings of adult damselflies, as well as a tandem pair, along Poamoho Stream in 2013 (Haines, 2018, *in litt.*); sightings of adult damselflies along Moanalua Stream and Poamoho Stream in 2015 (Haines, 2018, *in litt.*); sightings along Mānoa Stream at elevations ranging from 280 ft to 400 ft, at various locations, in 2015 and 2016 (Polhemus, 2018d, *in litt.*); sightings at the upper midreach of Kāhili Stream 2 in 2016; and along Kāwā Stream near Hawaiʻi Memorial Park in 2017 (Polhemus, 2018d, *in litt.*).

2.3.1.6 Habitat or ecosystem conditions (e.g., amount, distribution, and suitability of the habitat or ecosystem):
Critical habitat has been identified for the blackline Hawaiian damselfly and consists of slow sections or pools along midreach and headwater sections of perennial upland streams and seep-fed pools along overflow channels bordering such streams in lowland wet ecosystems on Oʻahu.

2.3.2 Five-Factor Analysis (threats, conservation measures, and regulatory mechanisms)

2.3.2.1 Present or threatened destruction, modification or curtailment of its habitat or range:

Degradation, modification, and destruction of native riparian stream corridors and seep-fed pools on O‘ahu threaten the existence of the blackline Hawaiian damselfly. The factors that contribute to these detriments are stream diversion and channelization, dewatering of aquifers, improper water well placement, introduced feral pigs (*Sus scofa*), invasive plants, hurricanes, flooding, and drought. The ongoing and likely increasing effects of global climate change (such as increasing temperature and changing rainfall patterns) are also likely to directly or indirectly impact the habitat of the native Hawaiian damselfly in general (USFWS, 2012).

Historically, damselflies in the genus *Megalagrion* were a common component of Hawaiian streams and wetlands at elevations ranging from sea level to the summit of the Ko‘olau Range on O‘ahu. The loss of stream habitat due to stream diversion, channelization, dewatering of their source aquifers, and vertical wells represent serious and ongoing threats to the blackline Hawaiian damselfly for the following reasons: they reduce the amount and distribution of stream habitat available to this species; they reduce stream flow, leaving lower elevation stream segments completely dry except during storms, or leaving many streams completely dry year round, thus reducing or elimination stream habitat; and they indirectly lead to an increase in water temperature that results in physiological stress and to the loss of blackline Hawaiian damselfly naiads. This species is particularly vulnerable to such changes (e.g., stream diversion, channelization, and dewatering), a vulnerability which is exacerbated by their range and habitat constrictions and declines in their population numbers (USFWS, 2012, p. 57675).

Intermittent flooding events likely occurred in the stream habitats of the blackline Hawaiian damselfly in the past, due to stochastic events such as storms and hurricanes. However, the current low numbers of individuals and populations, reduced range, combined with the life-history requirements in stream habitat of this damselfly increase its vulnerability to the threat of flooding. The impact of flooding events may be increased by channelization of stream reaches, or degradation of riparian vegetation by feral ungulates. Naiads may be washed out of streams into the surrounding terrestrial habitat or washed downstream into portions of streams that are occupied by nonnative predatory fish. Adults perching on surrounding vegetation may be washed into flooded streams and drown (USFWS, 2012, p. 57673).

Temporary loss of habitat associated with droughts is not uncommon in the Hawaiian Islands. These drought events often desiccate streams,

irrigation ditches, and reservoirs; deplete groundwater supplies; and directly removes damselfly hunting and breeding habitat. Droughts leads to an increase in the number of forest and brush fires, causing a reduction of native plant cover and habitat, and of plants used by the damselfly for perching and hunting for prey (USFWS, 2012, p. 57674).

The threats posed by conversion of wetlands and other aquatic habitat for agriculture and urban development are ongoing and are expected to continue into the future. These modified areas lack the aquatic habitat features that the blackline Hawaiian damselfly requires for essential life-history needs, such as marshes, side pools along streams, and slow sections of perennial streams, and no longer support populations of this species (USFWS, 2012, p. 57674).

The threats posed by introduced ungulates to the blackline Hawaiian damselfly and its habitat are serious because they cause trampling and grazing that directly impact the plants in riparian areas used by the damselfly for perching, reproduction, and hunting for prey; increase soil disturbance, leading to mechanical damage to plants in riparian areas; create open, disturbed areas conducive to weedy plant invasion and establishment of alien plants, which results over time in the conversion of a community dominated by nonnative vegetation; and increase watershed erosion and sedimentation, which affects aquatic habitat used by the blackline Hawaiian damselfly (USFWS, 2012, p. 57676; Wehr *et al*., 2018, p. 180, 185-187).

The blackline Hawaiian damselfly may be vulnerable to anticipated environmental changes that could result from global climate change. Environmental changes that may affect this species are expected to include habitat loss or alteration and changes in disturbance regimes (e.g., storms and hurricanes), in addition to direct physiological stress caused by increased stream water temperatures to which the native Hawaiian damselfly fauna are not adapted. The probability of a species going extinct as a result of these factors increases when its range is restricted, habitat decreases, and population numbers decline (Intergovernmental Panel on Climate Change, 2007, p. 8). The blackline Hawaiian damselfly has limited environmental tolerance, limited range, restricted habitat requirements, small population size, and low numbers of individuals. Therefore, we would expect this species to be particularly vulnerable to projected environmental impacts that may result from changes in climate, and subsequent impacts to their habitats (Pounds *et al.*, 1999, pp. 611-612; Still *et al*., 1999, p. 610; Benning *et al.*, 2002, pp. 14246 and 14248).

2.3.2.2 Overutilization for commercial, recreational, scientific, or educational purposes:
As was stated in the Final Listing Rule we are not aware of any threats to the blackline Hawaiian damselfly that are attributable to overutilization for commercial, recreational, scientific, or educational purposes (USFWS, 2012, p. 57677).

2.3.2.3 Disease or predation:
Predation by nonnative animal species (nonnative fish, bullfrogs, and ants) poses a significant threat to the blackline Hawaiian damselfly throughout its current and historical range for the reasons that follow.

Nonnative fish – Predation by nonnative fish is a serious and ongoing threat to the blackline Hawaiian damselfly. Naiads of the blackline Hawaiian damselfly are found under stones or in mats of algae, where they are vulnerable to predation by nonnative fish. Current literature indicates that the extirpation of Hawaiian damselflies from nearly all of their historical lowland habitat sites on O‘ahu is the result of predation by introduced nonnative fish (Moore and Gagnè, 1982, p. 4; Liebherr and Polhemus, 1997, p. 503; Englund, 1999, pp. 235-237; Brasher, 2003, p. 1055; Englund *et al*., 2007, p. 215; Polhemus, 2007, pp. 238-239). The threats posed by continued introduction and establishment of nonnative fish in Hawaiian waters, and the possible movement of those nonnative species to new streams and other aquatic habitat, are ongoing and expected to continue into the future. This represents a serious threat to the survival of the blackline Hawaiian damselfly (USFWS, 2012, p. 57678).

Bullfrogs – There is a strong correlation between the presence of the nonnative bullfrogs, *Rana catesbeiana*, with the absence of Hawaiian damselflies in their study of streams on all of the main Hawaiian Islands (Englund *et al*., 2007, pp. 215, 219). The bullfrogs are a threat to the blackline Hawaiian damselfly because they are omnivorous feeders that occur in the same habitat as the damselflies on O‘ahu (McKeown, 1996, pp. 24-27; Bury and Whelan, 1984, pp. 3-7; Lever, 2003, pp. 203-204). They have a negatively correlated pattern of occurrence with native damselflies, including the blackline Hawaiian damselfly (MISC, 2018).

Ants – Ants can be particularly destructive predators because of their high densities, recruitment behavior, aggressiveness, and broad range of diet (Reimer, 1993, pp. 14, 17-18). The threat of ant predation on the blackline Hawaiian damselfly is amplified by the fact that most ant species have winged reproductive adults (Borror *et al*., 1989, p. 738) and can quickly establish new colonies in additional suitable habitats (Staples and Cowie, 2001, pp. 53-55). Naiads may be susceptible to ant predation while perching on vegetation or rocks when they crawl out of the water or seek a terrestrial location for their metamorphosis into the adult state (Polhemus,

2008b, *in litt*.). Newly emerged adult damselflies are also susceptible to predation until their wings have sufficiently harden to permit flight (Polhemus and Asquith, 1996, p. 4).

2.3.2.4 Inadequacy of existing regulatory mechanisms:
The State of Hawai‘i considers all natural flowing surface water (streams, springs, and seeps) as State property (Hawai‘i Revised Statues 174c, 1987). The State Water Code has the regulatory mechanism in place to protect native Hawaiian damselflies or their habitat but water regulations have not been followed or enforced in a consistent manner by the State's Water Commission to prevent degradation of habitat. Administration of the Clean Water Act permitting program by the U.S. Army Corps of Engineers has not provided substantive protection of damselfly habitat, including any requirements for retention of adequate instream flows. This dewatering may threaten the blackline Hawaiian damselfly species if it proves to be dependent on the stream corridor, pools, and seeps. State and Federal regulatory mechanisms are not adequately controlling the spread of nonnative animal species between islands and watersheds. Predation by nonnative animal species poses a major ongoing threat to the blackline Hawaiian damselfly. Because existing regulatory mechanisms are inadequate to maintain aquatic habitat for the damselflies and to regulate the spread of nonnative species, the inadequacy of existing regulatory mechanisms is considered to be a significant and immediate threat (USFWS, 2012, p. 57681).

2.3.2.5 Other natural or manmade factors affecting its continued existence:
Representation, resilience, and redundancy appears to be severely limited in the *Megalagrion nigrohamatum nigrolineatum* species. The threat to the blackline Hawaiian damselfly from limited numbers of populations and individuals is ongoing and is expected to continue into the future due to several factors. This species may experience reduced reproductive vigor due to inbreeding depression; it may experience reduced levels of genetic variability, leading to diminished capacity to adapt and respond to environmental changes, thereby lessening the probability of long-term persistence; a single catastrophic event (e.g., hurricane, landslide) may result in extirpation of remaining populations and extinction of this species; and species with few known locations are less resilient to threats that might otherwise have a relatively minor impact on widely distributed species (USFWS, 2012, p. 57684).

The blackline Hawaiian damselfly faces the threat of low numbers of population and individuals. Jordan *et al*. (2007, p. 247) conducted a genetic and comparative phylogeography analysis on four Hawaiian *Megalagrion* species which demonstrated *Megalagrion* populations with

low genetic diversity are at greater risk of decline and extinction than those with high genetic diversity.

Table 1. Threats to *Megalagrion nigrohamatum nigrolineatum* and the status of ongoing conservation or management actions.

Threats	Listing Factor	Current Status	Conservation or Management Actions
Agriculture/urban development	A	Ongoing	Agriculture and urban development continue to pose a threat to the native Hawaiian damselfly habitat through encroachment and modification of water resources.
Stream alteration	A	Ongoing	Ongoing and extensive stream diversion and channelization continues to degrade the quantity and quality of native Hawaiian damselfly habitat and needed seeps.
Habitat modification by pigs	A	Ongoing	Ongoing habitat destruction and degradation of riparian habitat caused by feral pigs promote the establishment and spread of nonnative plants.
Habitat modification by nonnative plants	A	Ongoing	Nonnative plants that displace native species, increase runoff, and modify the riparian community lower or destroy the capability of the habitat to support viable populations of the blackline Hawaiian damselfly.
Stochastic events	A	Ongoing	The apparent restriction of the blackline Hawaiian damselfly to 17 small populations puts the species at risk of extinction from catastrophic events.
Climate change	A	Ongoing	Climate change is expected to affect water levels in stream corridors. Reduced genetic diversity of the remaining populations may limit the ability of the blackline Hawaiian damselfly to adapt.
Predation	C	Ongoing	Ants, bullfrogs and nonnative fish pose threats to the blackline Hawaiian damselfly adults and naiads.
Inadequate habitat protection	D	Ongoing	The State of Hawai‘i considers all natural flowing surface water (streams, springs, and seeps) as State property (Hawai‘i Revised Statues 174c, 1987). However, the State’s Water Commission has not consistently enforced State Water Code regulations to protect native Hawaiian damselfly stream and seep habitat. This dewatering may threaten the blackline Hawaiian damselfly if it proves to be dependent on seeps, streams, and the stream corridor where it has been observed.
Limited populations	E	Ongoing	*Megalagrion nigrohamatum nigrolineatum* individuals were last observed in 2017 at one site. The species appears to have low representation, resiliency, and redundancy.

2.4 Synthesis

The blackline Hawaiian damselfly, *Megalagrion nigrohamatum nigrolineatum*, is an endangered endemic species historically found on the island of Oʻahu. The biology of the blackline Hawaiian damselfly is not well understood. The blackline Hawaiian damselfly occurs in the slow sections or pools along midreach and headwater sections of perennial upland streams and in seep-fed pools along overflow channels bordering such streams. Naiads remain concealed and are found under stones or in mats of algae.

The blackline Hawaiian damselfly was known historically from the Koʻolau and Waiʻanae Mountains, from sea level to over 2,400 ft (730 m). Currently, this species is found in the lowland wet ecosystem on the windward and leeward sides of the Koʻolau Mountains, in the headwaters and upper reaches of 17 streams: Koloa, Kaipapaʻu, Maʻakua, upper Kaluanui, Palaa, Helemano headwaters, Poamoho, Kahana, Waiāhole, Waiawa, Kaʻalaea, Waiheʻe, Kahaluʻu, north Hālawa, Heʻeia, Kalihi, and Maunawili. All colonies of the blackline Hawaiian damselfly are constrained to portions of streams not occupied by nonnative predatory fish, that is, stream portions above geologic or manmade barriers (e.g., waterfalls, steep gradients, dry stream midreaches, or constructed diversions). At the time when the final listing rule was being written (2012), the 17 stream colonies were estimated to total 800 to 1000 individuals, with approximately 50 individuals per stream.

Recent observations include sightings of adult damselflies, as well as a tandem pair, along Poamoho Stream in 2013; sightings of adult damselflies along Moanalua Stream and Poamoho Stream in 2015; sightings along Mānoa Stream at elevations ranging from 280 ft to 400 ft, at various locations, in 2015 and 2016; sightings at the upper midreach of Kāhili Stream 2 in 2016; and along Kāwā Stream near Hawaiʻi Memorial Park in 2017.

Current threats to the *Megalagrion nigrohamatum nigrolineatum* include nonnative predatory fish species, bullfrogs, and ants; habitat modification from development, stream alteration, introduced ungulates, and non-native plants, as well as low resiliency to impacts from climate change and stochastic events (Table 1). Currently, existing regulations are inadequate to protect this species from introduction of nonnative species and to maintain their aquatic and riparian habitat. A Recovery Outline that included *Megalagrion nigrohamatum nigrolineatum* was published in July 2018. Threats identified in the Final Listing Rule, the Recovery Outline, and this 5-Year Review are not sufficiently managed throughout the range of the species. Therefore, the blackline Hawaiian damselfly meets the definition of endangered as it remains in danger of extinction throughout its range.

3.0 RESULTS

3.1 Recommended Classification:

____ Downlist to Threatened
____ Uplist to Endangered
____ Delist
____ *Extinction*
____ *Recovery*
____ *Original data for classification in error*
__X__ No change is needed

3.2 New Recovery Priority Number:

Brief Rationale:

3.3 Listing and Reclassification Priority Number: N/A

Reclassification (from Threatened to Endangered) Priority Number: ____
Reclassification (from Endangered to Threatened) Priority Number: ____
Delisting (regardless of current classification) Priority Number: ____

Brief Rationale:

4.0 RECOMMENDATIONS FOR FUTURE ACTIONS

- Conduct targeted surveys for *Megalagrion nigrohamatum nigrolineatum* to determine the distribution of the species.
- Based on survey results, stabilize and protect extant populations of *Megalgrion nigrohamatum nigrolineatum* and develop and implement a recovery plan.
- Identify the primary habitat features and characteristics necessary for *Megalagrion nigrohamatum nigrolineatum* recovery.
- Identify and evaluate the primary biological characteristics necessary for *Megalagrion nigrohamatum nigrolineatum* recovery.
- Maintain and protect the habitat of *Megalagrion nigrohamatum nigrolineatum***.**
- Refine and calibrate the indices for invertebrate communities that are used for monitoring programs to improve stream habitat.
- Eliminate or manage nonnative predators of *Megalagrion nigrohamatum nigrolineatum.*

- Survey, document, and manage threats to *Megalagrion nigrohamatum nigrolineatum*.

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U.S. FISH AND WILDLIFE SERVICE
5-YEAR REVIEW of Blackline Hawaiian Damselfly
(*Megalagrion nigrohamatum nigrolineatum*)

Current Classification: Endangered

Recommendation resulting from the 5-Year Review:

____ Downlist to Threatened
____ Uplist to Endangered
____ Delist
_X__ No change needed

Appropriate Listing/Reclassification Priority Number, if applicable: _____

Review Conducted By:
Charmian Dang, Fish and Wildlife Biologist, PIFWO
Megan Laut, Acting Animal Recovery Coordinator, Conservation & Restoration Team Manager, PIFWO

FIELD OFFICE APPROVAL:

for MEGAN LAUT Digitally signed by MEGAN LAUT Date: 2019.07.17 14:40:49 -10'00'

Field Supervisor, Pacific Islands Fish and Wildlife Office