Anax strenuus. Photo: Karl Magnacca.

Terrestrial Invertebrates

Damselflies and dragonflies
Odonata

ORDER INCLUDES:
3 Native Families
4 Native Genera
29 Native Species
27 Endemic Species

GENERAL INFORMATION: Dragonflies and damselflies are among the most common and easily recognized aquatic insects. All members of the order are predaceous, both as immatures and adults. All dragonflies and damselflies have an aquatic immature form (naiad). Adults have large compound eyes, two pairs of large membranous wings, and a long, thin abdomen. The order consists of two suborders, one (Anisoptera) containing the dragonflies and the other (Zygoptera) the damselflies. Dragonflies are very strong fliers, soaring for long distances, and at rest holding their wings spread. Damselflies generally do not fly long distances, and at rest hold their wings together above the body. Because of the diversity and extensive adaptive radiation, the native damselfly genus *Megalagrion* is particularly well-studied. Many *Megalagrion* species are endemic to single islands or ridges, and at least ten of the 23 species in the genus are considered at risk. *Megalagrion oahuense* is one of the few truly terrestrial damselflies in the world. Several other species are semi-terrestrial, the naiads living in tiny amounts of water held by the rosette-forming native plants *Astelia* and *Freycinetia*. The endemic green darner dragonfly, *Anax strenuus*, is one of our largest native insects with a wingspan of up to 14 cm (5.5 inches). Six endemic damselflies (*Megalagrion leptodemas*, *M. nesiotes*, *M. nigrohamatum nigrolineatum*, *M. oceanicum*, *M. pacificum*, and *M. xanthomelas*) are federally listed as endangered.

DISTRIBUTION: Dragonflies and damselflies are known from all the Main Hawaiian Islands except for Kahoʻolawe. The widespread indigenous globe skimmer dragonfly (*Pantala flavescens*) is also found in the NWHI.

ABUNDANCE: Most of the native dragonflies remain relatively common, although the endemic clubtail *Nesogonia blackburni* is somewhat rare. However, many species of *Megalagrion* are rare, and their abundance and distribution has declined dramatically over the past 100 years.

LOCATION AND CONDITION OF KEY HABITAT: Larvae and adults occur in or near a wide range of aquatic habitats (e.g., streams, plunge pools, reservoirs, anchialine pools, lowland swamps and marshes), montane forests and bogs, and lowland habitats, many of which are threatened by habitat change and loss. In particular, the introduction of mosquitofish and topminnows (Poeciliidae) for control of mosquitoes has eliminated *Megalagrion* damselflies from many streams. Bullfrogs (*Rana catesbeiana*) also prey on naiads and can spread from stream to stream across land.

THREATS:

- Habitat loss or degradation caused by water diversions, pollution, and disturbance by feral ungulates.
- Predation of naiads by non-native invasive invertebrates, fish, and frogs.

CONSERVATION ACTIONS: The goals of conservation actions are not only to protect current populations and key breeding habitats but also to establish additional populations, thereby reducing the risk of extinction. In addition to common statewide and island conservation actions, specific management directed toward dragonflies and damselflies should include the following:

- Identify and protect streams currently free of non-native species and human alterations, particularly in lowland areas.
- Conduct surveys to determine distribution and abundance of known dragonfly and damselfly populations and to document and identify new species.
- Enhance protection of key watersheds.
- Support captive breeding and relocation/translocation of endangered *Megalagrion* species.
- Preserve, maintain, and restore habitats supporting existing populations.

MONITORING:

- Continue monitoring of known populations to assess population trends.
- Survey for additional, new populations.
- Conduct surveys for species believed to be extinct.

RESEARCH PRIORITIES:

- Determine the cause(s) of decline of stream-breeding species, particularly on O‘ahu.
- Conduct studies to determine life history factors for conservation.
- Assess potential haplotype differences among island populations of widespread species to determine the importance of protecting populations on individual islands.

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