

## VectorMap Spotlight Report: Habitat Suitability Models for Malaria Vectors of South America

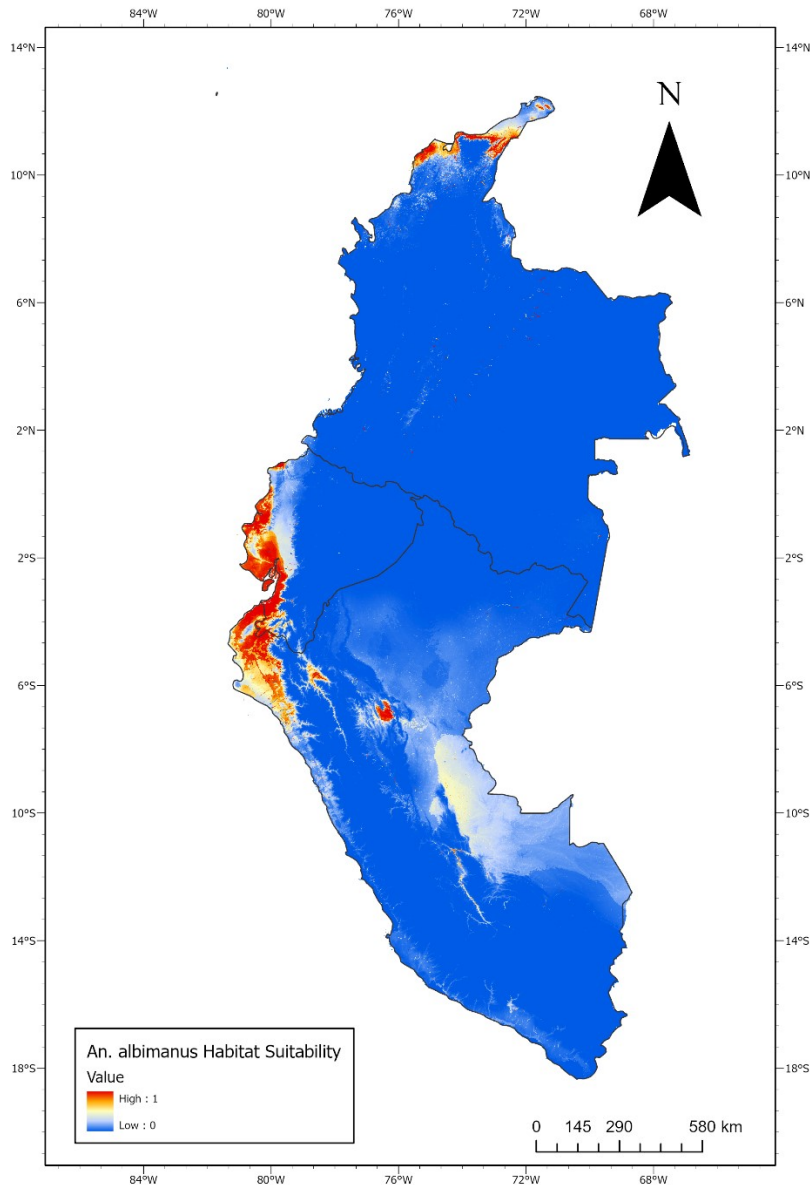
**Summary:** Using mosquito surveillance data submitted by NAMRU-6, we constructed habitat suitability models for four vector species. A covariance significance assessment was conducted for all target species. Using the most significant variables and surveillance data, 10 bootstrap models for each species were performed using Maxent version 3.4.1. Surveillance data submitted by NAMRU-6 and incorporated in models presented here, are available via the VectorMap data portal (<http://vectormap.si.edu/>). Habitat suitability modeled for the following species:

- [\*Anopheles albimanus\*](#)
- [\*Anopheles darlingi\*](#)
- [\*Anopheles oswaldoi\*](#)
- [\*Anopheles pseudopunctipennis\*](#)



## 1. *Anopheles albimanus* Wiedemann, 1821

[Link to WRBU Species Profile](#)



### Bionomics

#### Immatures

Preferred oviposition sites for *An. albimanus* s.l. are typically permanent, open-sunlit ground pools with muddy substrata, abundant algal vegetation, particularly blue-green algae, and clear water. These can include fresh or brackish water ground pools, lakes and swamps, drainage ditches, rice fields, and occasionally in water-filled animal hoof prints after heavy rains.

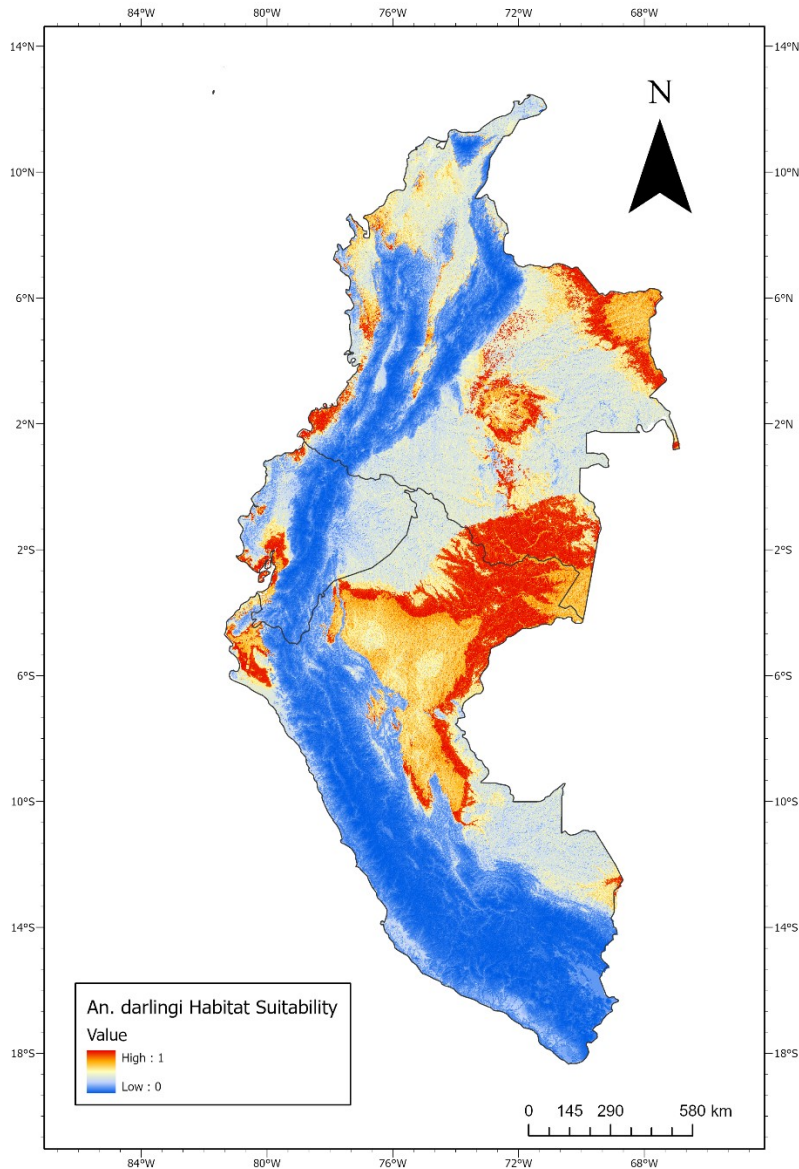
#### Adults

Adult *An. albimanus* s.l. are typically found in humid lowlands (<500m a.s.l.); populations peak in the dry season, but they are present all year round. Biting patterns vary across its range. Females rest indoors in high number within houses in Mexico, yet in other parts of its range, females will feed indoors but return to the forest to rest. Horse-baited traps are the standard method for assessing adult densities of *An. albimanus* s.l. in Latin America. In Mexico, females are readily attracted to human-, horse- and donkey-baited traps, with highest numbers collected from 18:00–24:00, while the biting peak in Colombia is 22:00–24:00. *Anopheles albimanus* B was found resting in horse stables and relentlessly biting man during the day in Ecuador; suggesting this taxon could also be a formidable malaria vector.

**Vector Status:** *Plasmodium falciparum*, *P. vivax*.

## *Anopheles darlingi* Root, 1926

[Link to WRBU Species Profile](#)



### Bionomics

#### Immatures

Immature *An. darlingi* are typically found in partially-shaded, clear freshwater habitats—debris-dense stream margins, ponds with muddy bottoms, grassy ground pool and swamps in plantations or cultivated fields—always with emergent or floating vegetation. *Anopheles darlingi* immatures have been reportedly collected in abandoned gold mines in Venezuela and in brackish water in Belize.

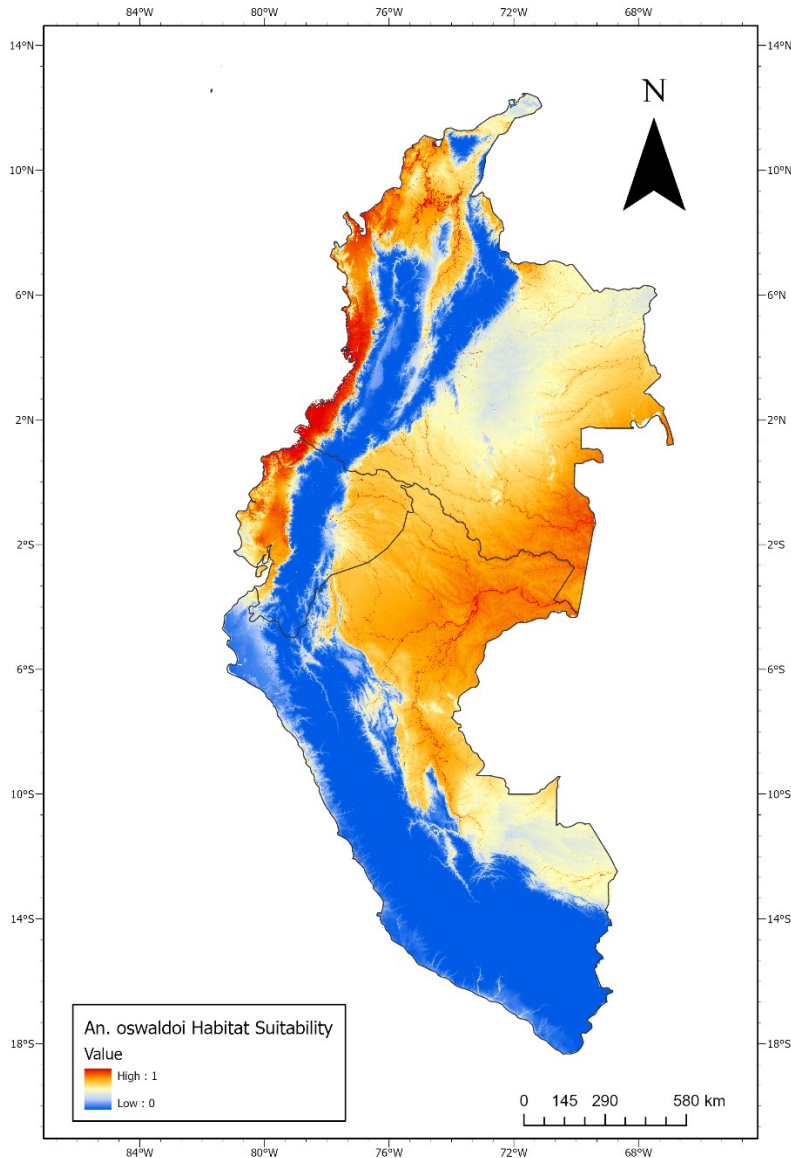
#### Adults

Adult *An. darlingi* are associated with humid lowland, riverine forest-edge environment—especially in areas affected by deforestation, human settlements and agriculture—hence are closely associated with humans. They are highly anthropophilic, endophagic, but always rest outdoors. The molecularly variant Dourado population is exophilic and exophagy has been noted in sites where heavy indoor insecticidal spraying is implemented for vector control. Efforts are needed to clarify the taxonomic status of the Dourado population, especially as the only synonym—*paulistensis* Galvão, Lane & Correa—was described from this same location.

**Vector Status:** *Plasmodium falciparum*, *P. vivax*.

*Anopheles oswaldoi* (Peryassú, 1922)

[Link to WRBU Species Profile](#)



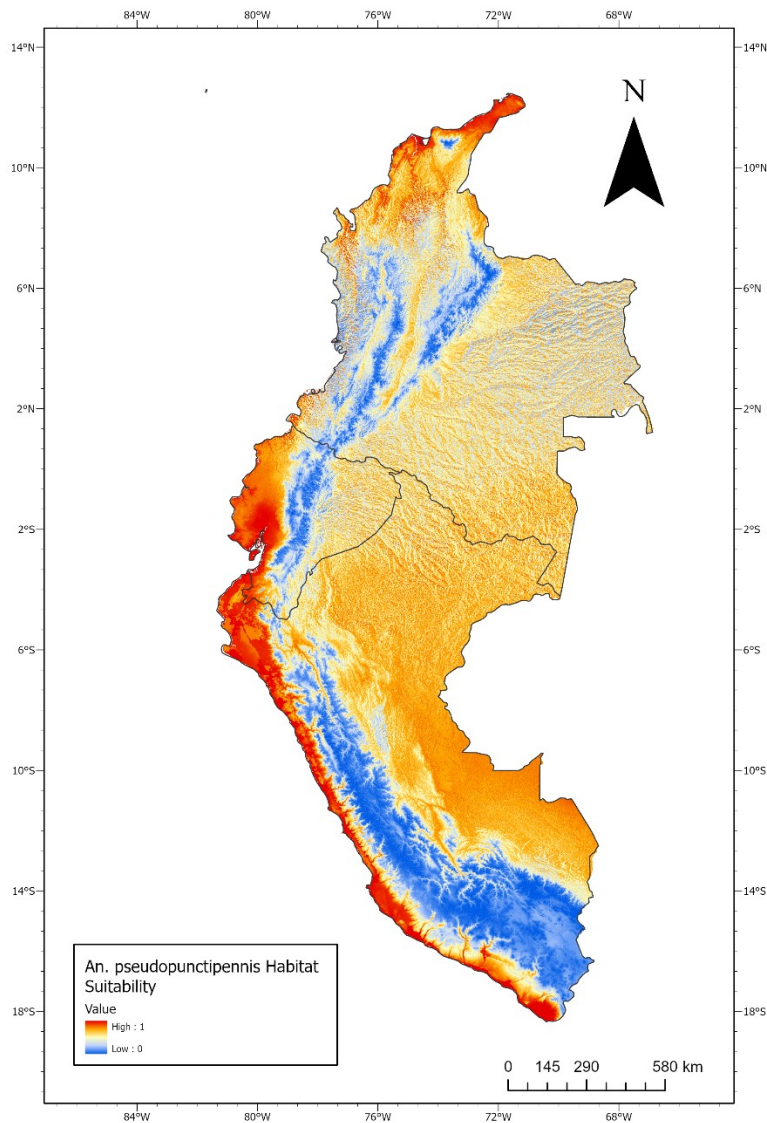
**Bionomics:**

The immature stages of oswaldoi are found in the interior, usually in or on the margins of tropical forests, frequently along roads, in cultivated fields or grasslands adjacent to forested areas. They occur in permanent or temporary ground pools, margins of ponds or lakes, swamps, and stream-side pools; the sites most often are found in deeply to partially shaded areas, less often in full sun. The immature stages are commonly collected in the grassy margins of pools with muddy bottoms. Algae and abundant flotsam often are present. The water is always fresh and may be turbid or clear.

**Vector Status:** *Plasmodium falciparum*, *P. vivax*.

## *Anopheles pseudopunctipennis* Theobald, 1901

[Link to WRBU Species Profile](#)



### Bionomics

#### Immatures

Typical immature habitats of *Anopheles pseudopunctipennis* include open, sunlit freshwater stream pools or margins, flood-plain ground pools and drainage ditches, usually with abundant filamentous green algae (e.g. *Spirogyra*), upon which the larvae rely for food and protection from predators. *Anopheles pseudopunctipennis* populations peak in the dry season.

#### Adults

*Anopheles pseudopunctipennis* is important in dry-season malaria transmission in valleys and foothills in mountainous areas. In Bolivia, it has been found actively transmitting malaria at elevations up to 2,800 m. In Central America and California (US) *An. pseudopunctipennis* is highly anthropophilic, entering houses to feed, whereas in Costa Rica, Grenada, and the Panamanian Canal Zone, the species is never found biting indoors.

**Vector Status:** *Plasmodium vivax*

#### **Bionomics Information gathered from:**

Wilkerson, R. C., Linton, Y. M., & Strickman, D. (2021). Mosquitoes of the World (Vol. 1 & 2). Johns Hopkins University Press.