

# MAPAS DE DISTRIBUCIÓN POTENCIAL EN COLOMBIA

Se obtuvo la distribución de las aves del Lago de Tota mediante modelación de nicho ecológico utilizando el algoritmo de máxima Entropía (Phillips et al. 2006). En la construcción del modelo seguimos la conceptualización de la teoría BAM para delimitar el área geográfica que la especie podría llegar a ocupar gracias a la dispersión; esta área se denomina M (Soberón J. M. 2010). El espacio geográfico M para cada especie corresponde a las provincias biogeográficas definidas por Morrone (2014), que presentaron al menos una ocurrencia de la especie.

En la construcción de los modelos de nicho se utilizaron ocurrencias verificadas bajo la metodología de Biomodelos del Instituto Alexander von Humboldt para 81 especies. Para las especies restantes, los registros fueron descargados directamente del GBif (Global Biodiversity Information Facility) y fueron filtrados según los rangos altitudinales reportados para cada especie según McMullan M. et al. (2011). Para once especies se modeló el nicho utilizando la plataforma Wallace (Kass J. M. et al. 2018), ya que permitió acceder a ocurrencias más recientes. Las ocurrencias de cada especie fueron relacionadas con 19 variables bioclimáticas de WorldClim V2 (Fick, S.E. & R.J. Hijmans, 2017) a una resolución de 20 km<sup>2</sup>. Se seleccionaron los modelos con mejor ajuste de acuerdo al área bajo la curva (AUC) y se obtuvo un mapa binario siguiendo el criterio de percentil 10.

Una vez se obtuvo el mapa binario se realizó un post procesamiento para evitar sobrepredicción (<https://github.com/pamontoya/hybridsMaps/blob/master/hybri2>). El mapa de distribución final se denomina híbrido dos y se obtuvo reduciendo la predicción del modelo de nicho a regiones continuas con al menos una ocurrencia.

## Literatura Mapas de Distribución

Fick, S.E. & R.J. Hijmans, 2017. Worldclim 2: New 1-km spatial resolution climate surfaces for global land areas. *International Journal of Climatology*.

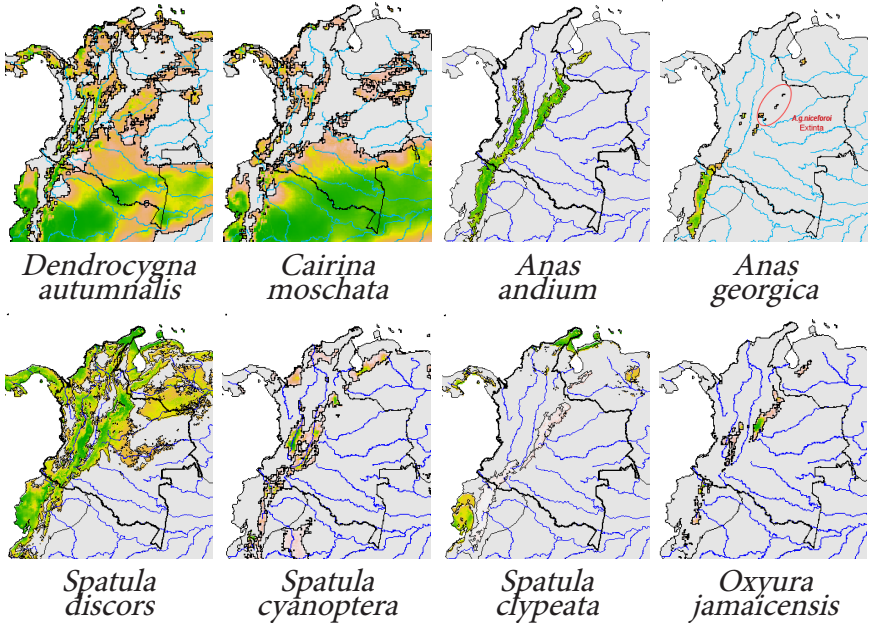
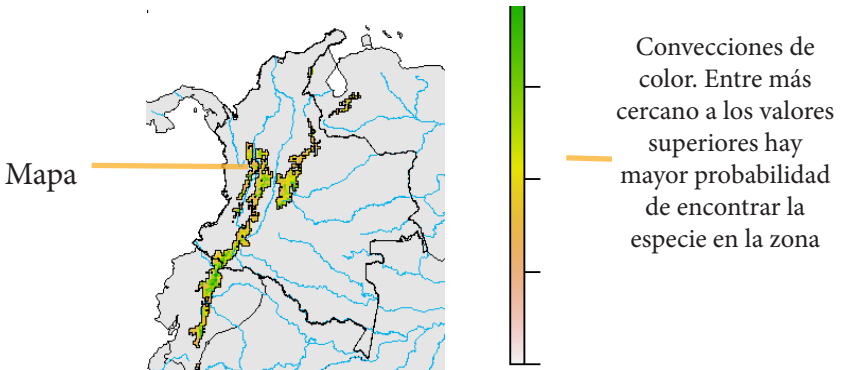
Kass, J. M., Vilela, B., Aiello-Lammens, M. E., Muscarella, R., Merow, C., & Anderson, R. P. (2018). Wallace: A flexible platform for reproducible modeling of species niches and distributions built for community expansion. *Methods in Ecology and Evolution*, 9(4), 1151-1156.

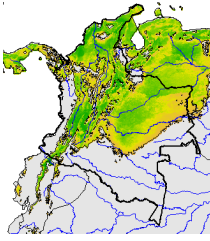
McMullan, M., Quevedo, A., & Donegan, T. M. (2011). Guía de campo de las aves de Colombia. ProAves.

Morrone, J.J.(2014). Cladistic biogeography of the Neotropical region identifying the main events in the diversification of the terrestrial biota. *Cladistics*, 30,202-214.

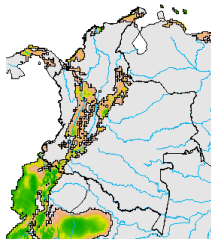
Phillips S., Robert P. Anderson, Robert E. Schapire. 2006. Maximum entropy modeling of species geographic distributions. *Ecological Modelling*, 190:231-259, 2006.

Soberón, J. M. (2010). Niche and area of distribution modeling: a population ecology perspective. *Ecography*, 33(1), 159-167.

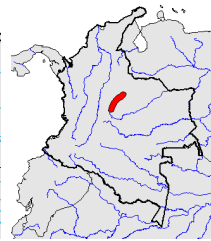




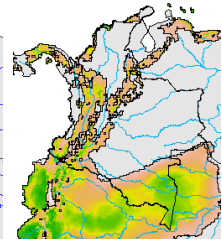
*Colinus cristatus*



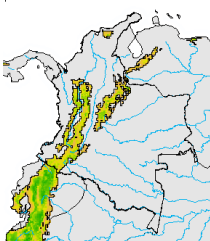
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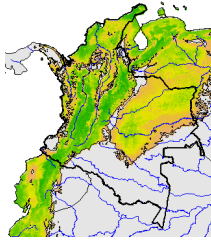
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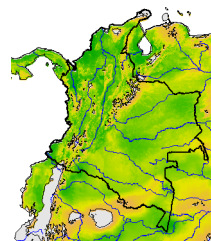
*Columba livia*



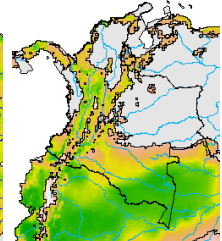
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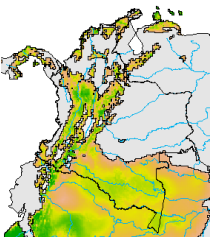
*Zenaida auriculata*



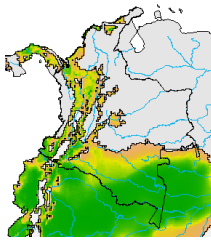
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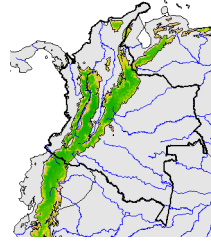
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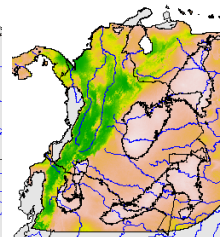
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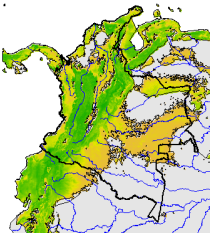
*Chordeiles minor*



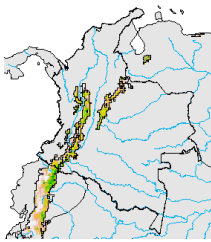
*Systellura longirostris*



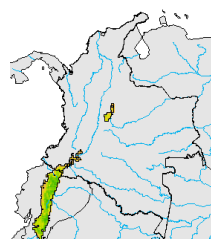
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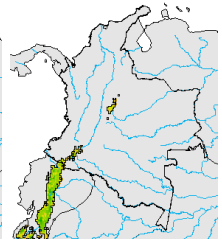
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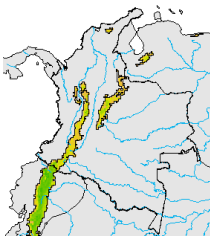
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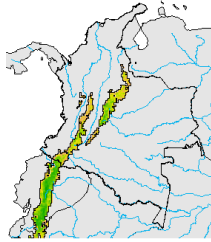
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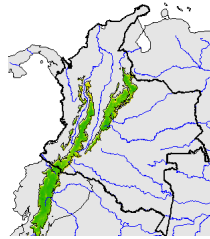
*Lesbia nuna*



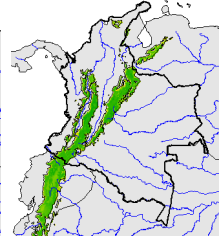
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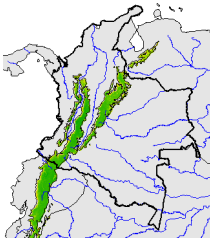
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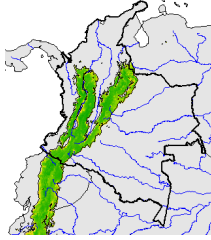
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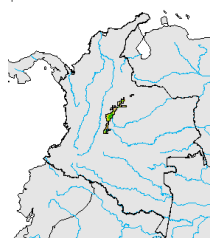
*Lafresnaya lafresnayi*



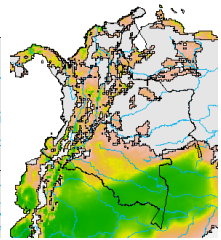
*Ensifera ensifera*



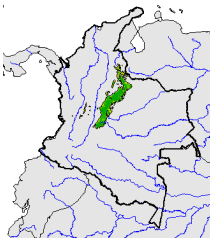
*Chaetocercus mulsant*



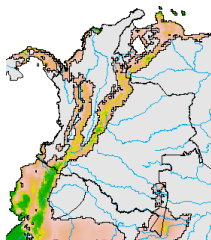
*Rallus semiplumbeus*



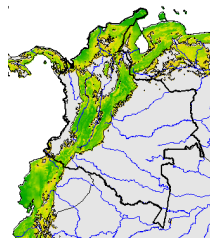
*Porphyrio martinica*



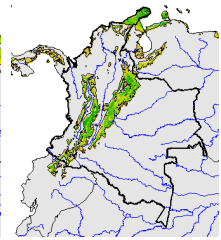
*Porphyriops melanops*



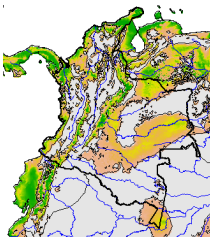
*Porzana carolina*



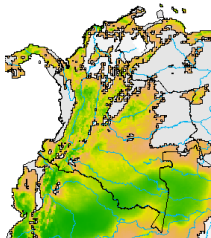
*Gallinula galeata*



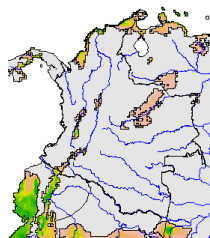
*Fulica americana*



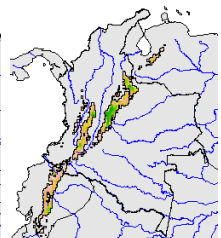
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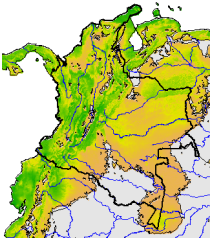
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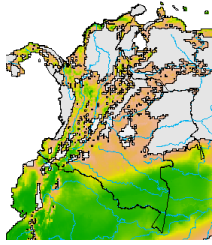
*Himantopus mexicanus*



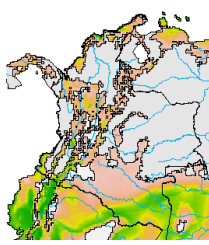
*Gallinago nobilis*



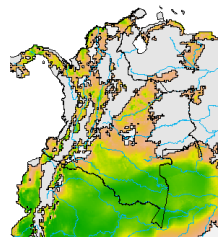
*Actitis macularius*



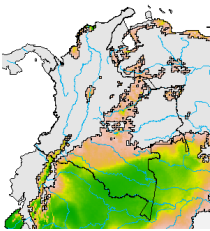
*Tringa solitaria*



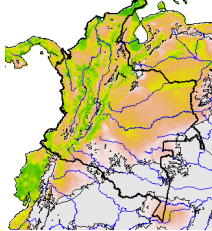
*Tringa flavipes*



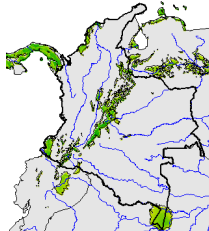
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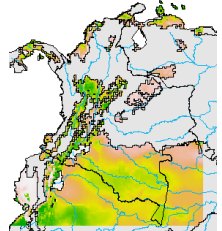
*Phaetusa simplex*



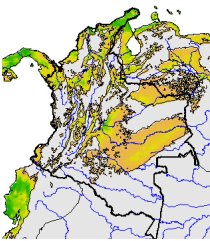
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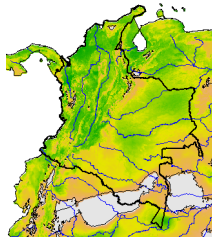
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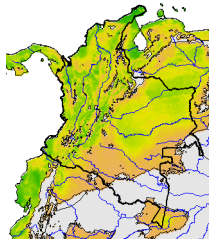
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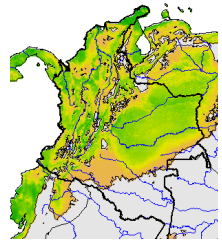
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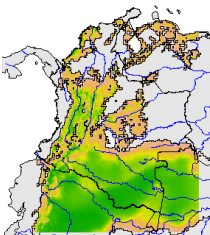
*Butorides striata*



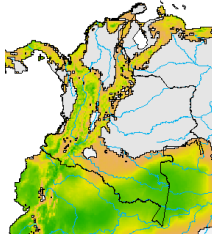
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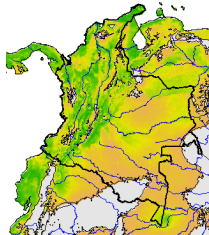
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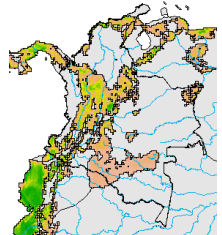
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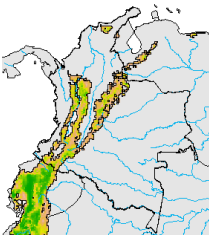
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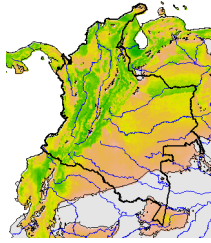
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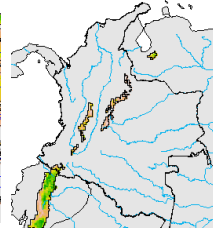
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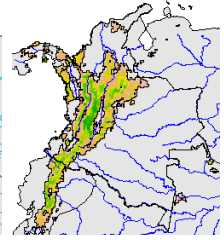
*Accipiter striatus*



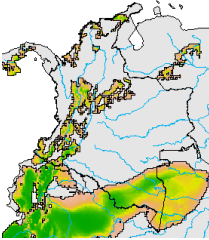
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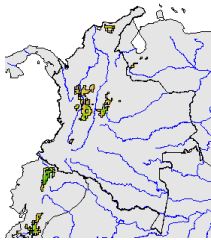
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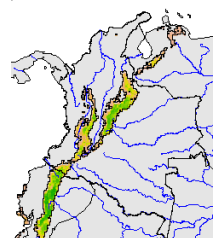
*Buteo platypterus*



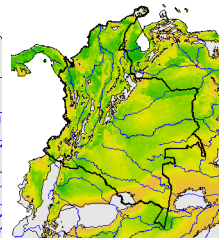
*Tyto alba*



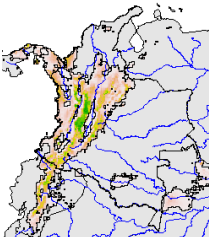
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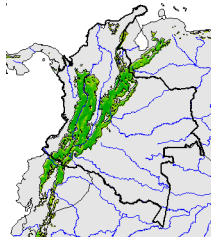
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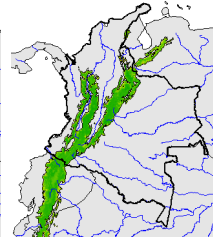
*Chloroceryle amazona*



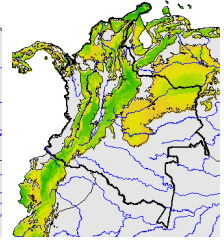
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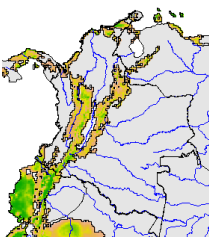
*Picoides fumigatus*



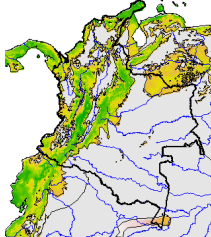
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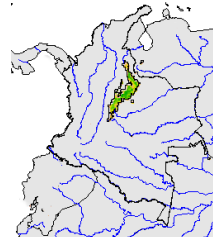
*Falco sparverius*



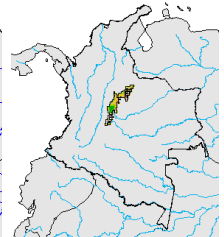
*Falco columbarius*



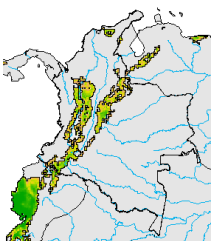
*Falco peregrinus*



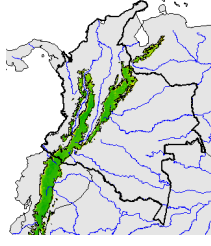
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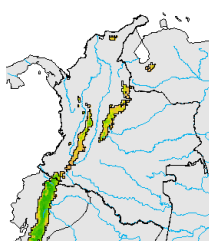
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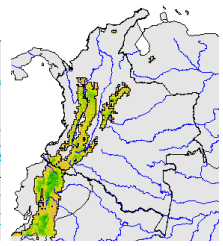
*Elaenia  
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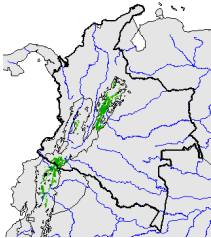
*Mecocerculus  
stictopterus*



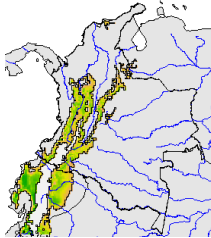
*Mecocerculus  
leucophrys*



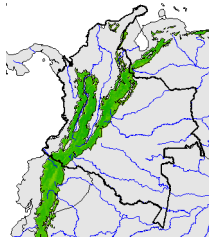
*Serpophaga  
cinerea*



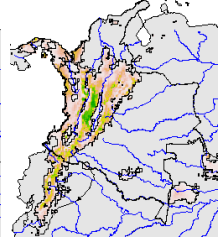
*Pseudocolopteryx  
acutipennis*



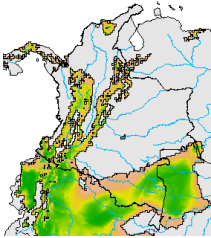
*Zimmerius  
chrysops*



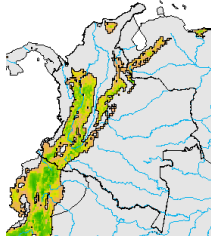
*Pyrrhomyias  
cinnamomeus*



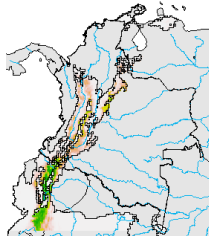
*Hirundinea  
ferruginea*



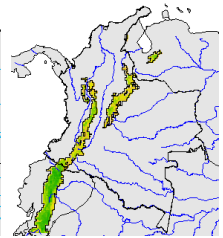
*Contopus  
cooperi*



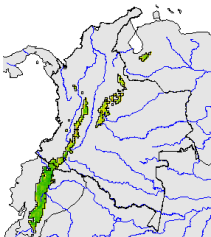
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nigricans*



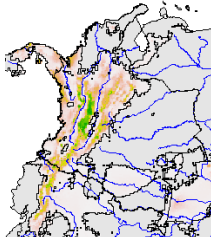
*Pyrocephalus  
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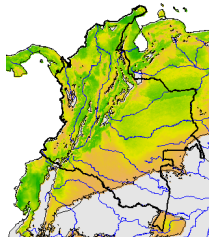
*Myiotheretes  
striaticollis*



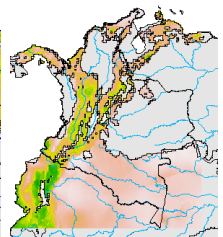
*Ochthoeca  
fumicolor*



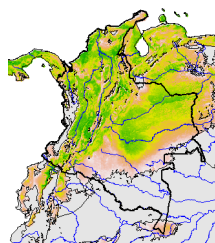
*Machetornis  
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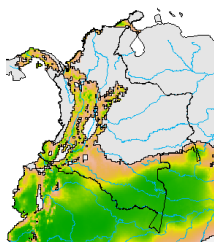
*Pitangus  
sulphuratus*



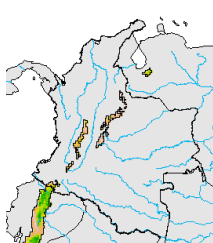
*Tyrannus  
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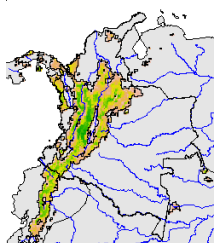
*Tyrannus savana*



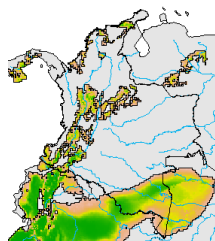
*Tyrannus tyrannus*



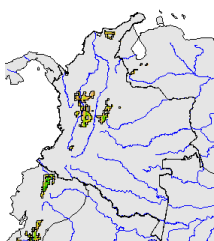
*Geranoaetus melanoleucus*



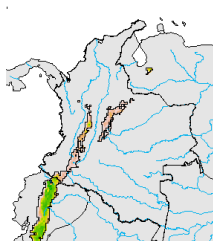
*Buteo platypterus*



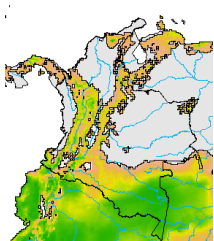
*Tyto alba*



*Asio stygius*



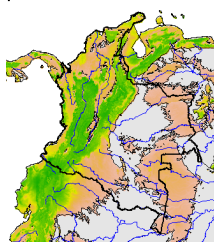
*Ampelion rubrocristatus*



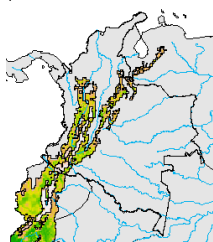
*Vireo olivaceus*



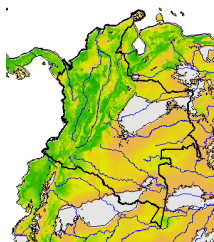
*Eremophila alpestris*



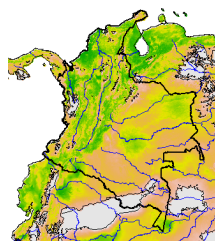
*Pygochelidon cyanoleuca*



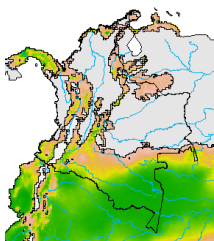
*Orochelidon murina*



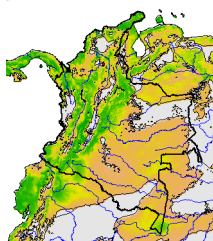
*Stelgidopteryx ruficollis*



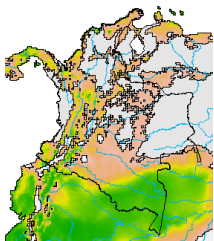
*Progne tapera*



*Progne subis*

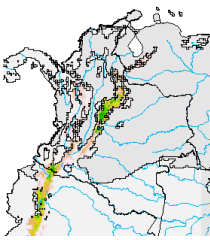


*Riparia riparia*

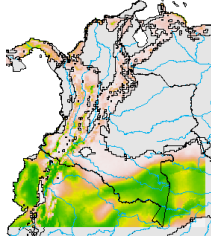


*Hirundo rustica*

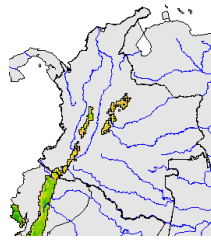




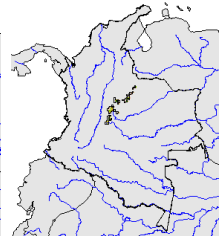
*Petrochelidon  
pyrrhonota*



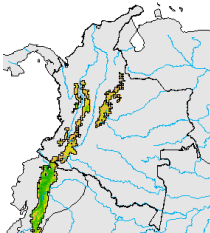
*Troglodytes  
aëdon*



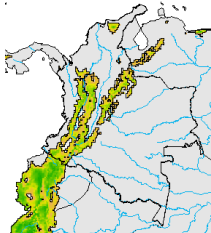
*Cistothorus  
platensis*



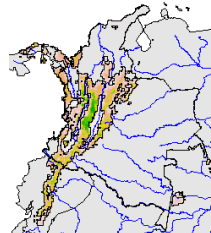
*Cistothorus  
apolinari*



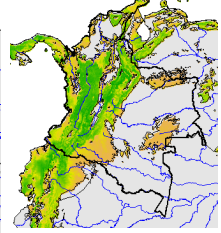
*Cinnycerthia  
unirufa*



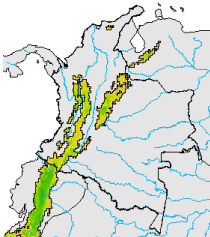
*Henicorhina  
leucophrys*



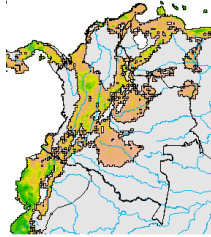
*Cinclus  
leucocephalus*



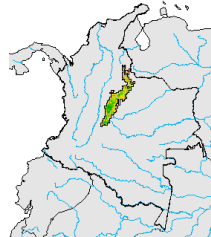
*Catharus  
ustulatus*



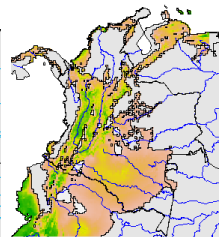
*Turdus  
fuscater*



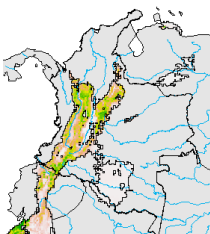
*Mimus  
gilvus*



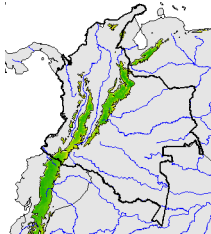
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rufum*



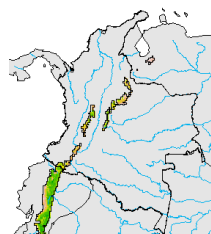
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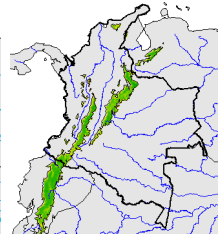
*Sicalis  
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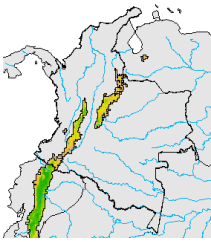
*Catamenia  
analis*



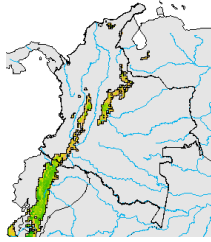
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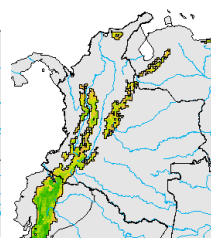
*Geospizopsis  
unicolor*



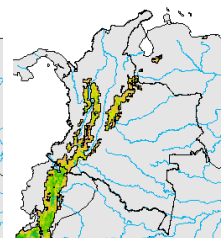
*Diglossa lafresnayii*



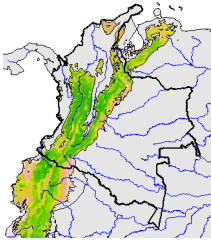
*Diglossa humeralis*



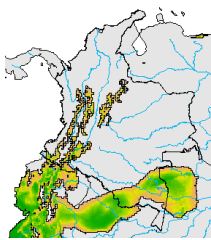
*Diglossa albilatera*



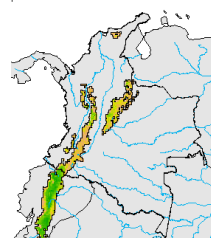
*Diglossa cyanea*



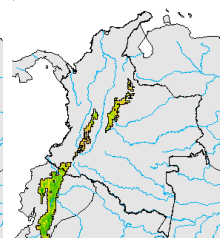
*Sporophila luctuosa*



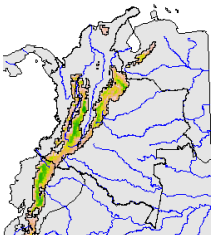
*Pipraeidea melanonota*



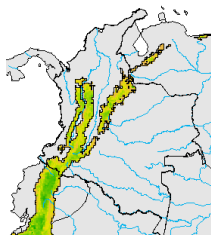
*Dubusia taeniata*



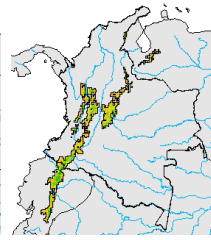
*Anisognathus igniventris*



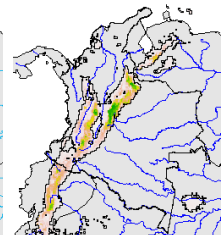
*Arremon assimilis*



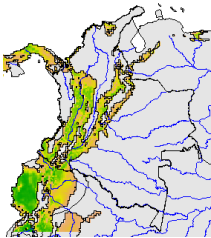
*Zonotrichia capensis*



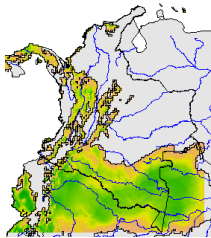
*Atlapetes schistaceus*



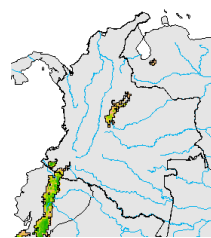
*Atlapetes pallidinucha*



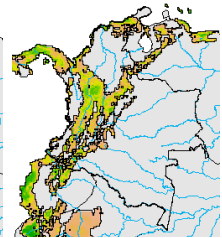
*Piranga rubra*



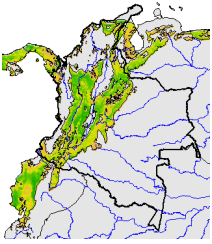
*Piranga olivacea*



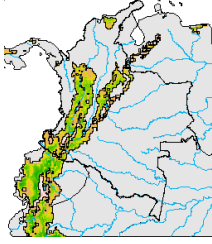
*Pheucticus aureoventris*



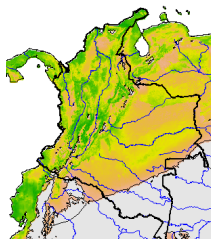
*Parkesia noveboracensis*



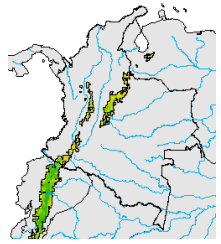
*Mniotilta varia*



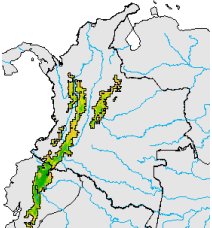
*Setophaga fusca*



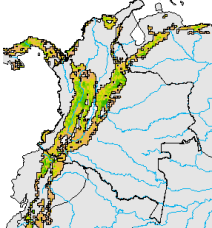
*Setophaga petechia*



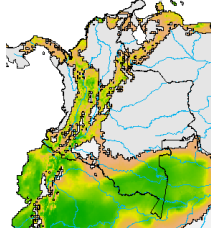
*Myiothlypis nigrocristata*



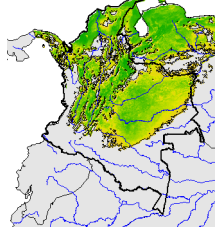
*Myioborus ornatus*



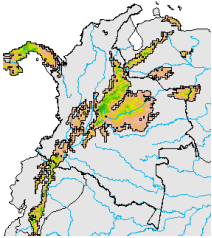
*Icterus chrysater*



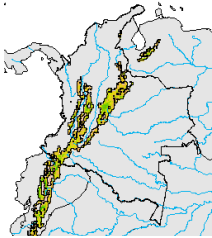
*Molothrus bonariensis*



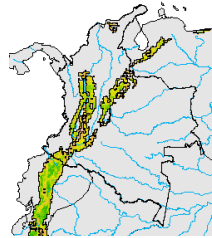
*Quiscalus lugubris*



*Sturnella magna*



*Spinus spinescens*



*Spinus psaltria*

