Package 'pciR'

May 9, 2026

Type Package

Title Proactive Conservation Index

Version 1.0.0

Description Calculates the Proactive Conservation Index, a new tool to prioritize species for conservation, which can incorporate information about future threats.

License GPL-3

Encoding UTF-8

LazyData true

Imports caret

Depends R (>= 4.1.0)

Suggests rmarkdown, knitr

VignetteBuilder knitr

RoxygenNote 7.3.2

NeedsCompilation no

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Contents

`optim_weights` *Optimizes weighting for the calculation of Proactive Conservation Index*

Description

`optim_weights` Optimizes weights for calculating Proactive Conservation Index,

Usage

```
optim_weights(
  sp,
  var_out,
  var_in = NULL,
  weight_out = NULL,
  weight_in = NULL,
  reference,
  type = "both",
  ...
)
```

Arguments

`sp`	character. Names of the taxa being evaluated.
`var_out`	numeric. Threat variables. higher values must indicate increased threat.
`var_in`	numeric. Interacting variables. Will modulate the effect of threat variables.
`weight_out`	numeric. Weights for threat variables
`weight_in`	numeric. Matrix of weights for the combination of interacting variables and threat variables.
`reference`	numeric. Threat reference towards which weights will be optimized.
`type`	character. Optimize weights for threat variables ("out"), for interacting variables ("in") or for both ("both").
`...`	additional arguments to be passed to function 'optim'.

Details

The Pearson correlation between the calculated pci and 'reference' is displayed as the weights are optimized.

Value

Vector ("out"), matrix ("in") or list ("both") with optimal weights.

Examples

```
# This function takes too long to run here.
#See vignette for a detailed explanation on how to use it.
```

---

pci *Calculates Proactive Conservation Index*

Description

pci Calculates the Proactive Conservation Index, a new tool to prioritize species for conservation, which incorporates information about future threats.

Usage

```
pci(sp, var_out, var_in = NULL, weight_out = NULL, weight_in = NULL)
```

Arguments

sp	character. Names of the taxa being evaluated.
var_out	numeric. Threat variables. higher values must indicate increased threat.
var_in	numeric. Interacting variables. Will modulate the effect of threat variables.
weight_out	numeric. Weights for threat variables
weight_in	numeric. Matrix of weights for the combination of interacting variables and threat variables.

Value

Data frame with PCI and rank.

Examples

```
# Invert variables that are negatively correlated with conservation priority

vert_df$inv_range_area <- 1/vert_df$range_area
vert_df$inv_brood_size <- 1/vert_df$brood_size
vert_df$inv_protected_area <- 1/((vert_df$protected_area*vert_df$range_area+0.0001))

# Select trait variables

traits_vertebrates <-
   vert_df[c("body_mass",
             "inv_range_area",
             "inv_brood_size",
             "inv_protected_area",
             "AHI")]
```

```
# Select threat variables for the year 2100, under scenarion SSP 5.85

threats_2100_585 <-
   vert_df[c("clim_2100_585",
             "landuse_2100_585",
             "popdens_2100_585",
             "inv_threat")]

# Calculate PCI

vertebrates_pci <-
   pci(sp = vert_df$binomial,
       var_out = threats_2100_585,
       var_in = traits_vertebrates)
```

---

vert_df *Threat data for 33565 global terrestrial vertebrates.*

Description

A data set containing data on threat correlates for 33565 global terrestrial vertebrates.

Usage

```
vert_df
```

Format

A data frame with 33565 rows and 21 variables:

binomial character. Species binomial name

class character. Taxonomic class

family character. Taxonomic family

range_area numeric. Area of distribution range, in km2

body_mass numeric. Maximum body mass, in grams

brood_size numeric. Maximum number of offspring per brood

protected_area numeric. Proportion of species range overlapping with protected area under category I to IV

AHI numeric. Artificial Habitat Intolerance, an index calculated from the IUCN Red List data on habitat use

iucn_cat character. IUCN Red List threat category in July 2022

clim_2050_245 numeric. Proportion of species range lost due to climate change in 2050, under SSP 2.45 scenario

clim_2100_245 numeric. Proportion of species range lost due to climate change in 2100, under SSP 2.45 scenario

clim_2050_585 numeric. Proportion of species range lost due to climate change in 2050, under SSP 5.85 scenario

clim_2100_585 numeric. Proportion of species range lost due to climate change in 2100, under SSP 5.85 scenario

landuse_2050_245 numeric. Proportion of species range lost due to land use change in 2050, under SSP 2.45 scenario

landuse_2100_245 numeric. Proportion of species range lost due to land use change in 2100, under SSP 2.45 scenario

landuse_2050_585 numeric. Proportion of species range lost due to land use change in 2050, under SSP 5.85 scenario

landuse_2100_585 numeric. Proportion of species range lost due to land use change in 2100, under SSP 5.85 scenario

popdens_2050_245 numeric. Mean human population density in 2050, under SSP 2.45 scenario

popdens_2100_245 numeric. Mean human population density in 2100, under SSP 2.45 scenario

popdens_2050_585 numeric. Mean human population density in 2050, under SSP 5.85 scenario

popdens_2100_585 numeric. Mean human population density in 2100, under SSP 5.85 scenario

inv_threat numeric. Proportion of species range under high or very high threat of biological invasion in 2100 under A3 scenario

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