Package: bbsTaiwan (via r-universe)

November 24, 2024

Title Streamline Taiwan Breeding Birds Survey (BBS) Data Retrieval and Analysis

Version 1.0.0

Description The goal of bbsTaiwan is to streamline the retrieval and analysis of Taiwan Breeding Bird Survey (BBS) data. This package facilitates data access from GBIF, where Taiwan BBS data are stored. While the data is openly available on GBIF, its complex arrangement in the Darwin Core format can make it challenging to understand and use, often requiring advanced data wrangling skills. The bbsTaiwan package is designed to simplify this process, making it easier to access and utilize Taiwan BBS data.

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Encoding UTF-8

Roxygen list(markdown = TRUE)

RoxygenNote 7.3.2

URL https://sunnytseng.github.io/bbsTaiwan/, https://github.com/SunnyTseng/bbsTaiwan

BugReports https://github.com/SunnyTseng/bbsTaiwan/issues

Suggests knitr, patchwork, rmarkdown, testthat (>= 3.0.0)

Config/testthat/edition 3

VignetteBuilder knitr

Depends R (>= 2.10)

Config/testthat/parallel true

LazyData true

Imports checkmate, cli, dplyr, ggplot2, purrr, stringr, terra, tidyr, tidyterra

Config/pak/sysreqs libgdal-dev gdal-bin libgeos-dev libicu-dev libssl-dev libproj-dev libsqlite3-dev libudunits2-dev

Repository https://ropensci-champions.r-universe.dev

RemoteUrl https://github.com/SunnyTseng/bbsTaiwan

RemoteRef HEAD

RemoteSha b3ae381f87869dff148449b64a0c8b7fc8c94c35

Contents

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bbs_fetch	*Fetch BBS Occurrence Data by Species*

Description

This function fetches occurrence data for specified target species, utilizing both the event and occurrence tables from GBIF. The fetched dataset undergoes the following processing steps:

1. **Join**: Combines the event, occurrence, and measurementorfacts datasheets from GBIF into a single cohesive dataset.

2. **Filter**: Retains only the observations for specified species using the `target_species` argument. The entered Chinese common name was linked to scientific name by bbs_translate.

3. **Zero Fill**: Converts implicit missing values into explicit ones by filling in zeros for trips where the target species was not observed. Specifically, if a plot was visited during a particular year or trip but the target species was not observed, the species count will show a value of 0 for that row.

Usage

```
bbs_fetch(target_species)
```

Arguments

target_species

Character string specifying the Chinese common name of the species of interest. It can accept a single character string, such as `target_species = "　"`, or a vector, such as `target_species = c("　", "　")`.Use `" "` to return all species.

Value

A `tibble` containing the species occurrence data.

Examples

```
# For single species data fetch
bbs_fetch(target_species = "　")

# For multiple species data fetch
bbs_fetch(target_species = c("　", "　"))

# To return data for all species
bbs_fetch(target_species = " ")

# The function will return NULL if the target species is not found in the
# BBS species list
bbs_fetch(target_species = "　")
```

---

bbs_history	*Examine the Number of BBS Sites Surveyed Each Year*

Description

This function returns the number of sites surveyed each year in the BBS Taiwan project. Sites were mapped into five regions: East, West, South, North, and Mountain (elevation higher than 1,000 m).

Usage

```
bbs_history(type = "plot")
```

Arguments

type   Character string specifying the output format: either `"table"` or `"plot"`. Default value `type = "plot"`

Value

A `tibble` or a `ggplot` showing the number of sites surveyed each year across regions.

Examples

```
# Return the number of sites in a table
bbs_history(type = "table")

# Return the number of sites in a bar chart
bbs_history(type = "plot")
```

---

bbs_plotmap   *Visualize Species Distribution Across All BBS Sites*

Description

This function visualizes the sites surveyed for breeding birds in Taiwan, highlighting the presence and absence of specific species. It is designed upon the function bbs_fetch and bbs_translate.

Usage

```
bbs_plotmap(target_species)
```

Arguments

```
target_species
```

> Character string specifying the scientific name of the species of interest. It can accept a single character string, such as `target_species = "　"`, or a vector, such as `target_species = c("　", "　")`. The function can accept up to plotting 5 species in one figure. Use `NULL` to return a map of site distribution.

Value

A `ggplot` object showing the distribution map.

Examples

```
# For single species distribution
bbs_plotmap(target_species = "　")

# For multiple species distribution
bbs_plotmap(target_species = c("　", "　"))

# Simply the distribution of the surveyed sites
bbs_plotmap(target_species = NULL)
```

---

bbs_sites *Return the Coordinates of All BBS Sites*

Description

This function returns the coordinates of all BBS sites that were surveyed. No arguments are needed. The coordinates are reported using the WGS84 projection system. Use `terra::vect(geom = c("decimalLatitude", "decimalLongitude"), crs = "epsg:4326")` to transform the table to spatial object.

Usage

```
bbs_sites()
```

Details

The source data comes from the event table in the GBIF dataset.

Value

A tibble including the coordinates of all BBS survey sites, in WGS84.

Examples

```
# Get the full list of BBS sites in a tibble
bbs_sites()

# Transform BBS sites into a spatial object using terra package
bbs_sites() |>
terra::vect(geom = c("decimalLatitude", "decimalLongitude"), crs = "epsg:4326")
```

---

bbs_translate *Translate Bird Species' Chinese Common Name to Scientific Name*

Description

This function is intended for use under bbs_fetch and bbs_plotmap. This function helps users find the scientific names of birds from their Chinese common names for species found in Taiwan.

Usage

```
bbs_translate(target_species)
```

Arguments

`target_species`

> A single character string or a vector of character strings representing species' names in Chinese.

Value

A vector of bird species' scientific names. If the input species name is not included in the bird list of Taiwan, `NA` will be returned. Please check for any typos.

Examples

```
# For a single species
bbs_translate(" ")

# For multiple species
bbs_translate(target_species = c(" ", " ", "  ", "  "))
```

`bird_info`	*BBS Taiwan bird list*

Description

A list of bird species that recorded in BBS Taiwan, including the scientific name, Chinese name, English name

Usage

```
bird_info
```

Format

A data frame with 909 rows and 4 columns:

scientificName scientific name

chineseName all possible Chinese that were used for the species

englishName english name from Taiwan Wild Bird Federation

scientificName_t scientific name from Taiwan Wild Bird Federation ...

Source

https://drive.google.com/drive/folders/1ex6EDkXv82mpEKcPkOYrQJ_anlu3pI1E

event	*BBS Taiwan raw dataset on GBIF - event*

Description

A dataframe record BBS Taiwan event info. This is a raw dataset, which was downloaded directly from GBIF without any wrangling or cleaning.

Usage

```
event
```

Format

A data frame with 423,139 rows and 18 columns:

id

eventID

parentEventID

samplingProtocol

sampleSizeValue

sampleSizeUnit

samplingEffort

eventDate

eventTime

locationID

country

countryCode

locality

decimalLatitude

decimalLongitude

geodeticDatum

coordinateUncertaintyInMeters

coordinatePrecision ...

Source

https://www.gbif.org/zh-tw/dataset/f170f056-3f8a-4ef3-ac9f-4503cc854ce0

`extendedmeasurementorfact`
                    BBS Taiwan raw dataset on GBIF - extendedmeasurementorfact

---

Description

A dataframe record BBS Taiwan extendedmeasurementorfact, which contains info for associated occurrence record, such as time, location. This is a raw dataset, which was downloaded directly from GBIF without any wrangling or cleaning.

Usage

`extendedmeasurementorfact`

Format

A data frame with 1,649,589 rows and 7 columns:

id

measurementID

measurementType

measurementValue

measurementDeterminedDate

measurementDeterminedBy

measurementMethod ...

Source

https://www.gbif.org/zh-tw/dataset/f170f056-3f8a-4ef3-ac9f-4503cc854ce0

`measurementorfacts`   *BBS Taiwan raw dataset on GBIF - measurementorfacts*

Description

A dataframe record BBS Taiwan measurementorfacts, which contains info for associated event record, such as time, location. This is a raw dataset, which was downloaded directly from GBIF without any wrangling

Usage

`measurementorfacts`

Format

A data frame with 1,649,589 rows and 7 columns:

id
measurementID
measurementType
measurementValue
measurementDeterminedDate
measurementDeterminedBy
measurementMethod ...

Source

https://www.gbif.org/zh-tw/dataset/f170f056-3f8a-4ef3-ac9f-4503cc854ce0

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occurrence	*BBS Taiwan raw dataset on GBIF - occurrence*

Description

A dataframe record BBS Taiwan occurrence info. This is a raw dataset, which was downloaded directly from GBIF without any wrangling or cleaning.

Usage

```
occurrence
```

Format

A data frame with 385,131 rows and 11 columns:

id
basisOfRecord
occurrenceID
recordedBy
individualCount
occurrenceRemarks
eventID
scientificName
family
genus
vernacularName ...

Source

https://www.gbif.org/zh-tw/dataset/f170f056-3f8a-4ef3-ac9f-4503cc854ce0

`tw_elev`	*Elevation raster of Taiwan*

Description

A raster in dataframe xyz format, representing the elevation of Taiwan in 1m by 1m grids. The data were reprojected to WGS84 (EPSG:4326).

Usage

```
tw_elev
```

Format

A data frame with 38,575 rows and 3 columns:

x scientific name

y all possible Chinese that were used for the species

G1km__TWD97-121__DTM__ELE english name from Taiwan Wild Bird Federation ...

Source

https://github.com/WanJyunChen/Taiwan_environmental_dataset

`tw_map`	*Map of Taiwan*

Description

A sf file created by reading in shape file, showing the outline of Taiwan. The crs is WGS84 (EPSG:4326).

Usage

```
tw_map
```

Format

A sf object with 1 feature and 67 fields

Source

https://geodata.libraries.mit.edu

tw_region	*Map of eco-regions in Taiwan*

Description

There are three regions: North, West, and East, representing different ecosystems in Taiwan specifically for avian biodiversity. This map was developed by Hau-Jie Shiu in 2003.

Usage

```
tw_region
```

Format

Need more info

Source

https://ndltd.ncl.edu.tw/cgi-bin/gs32/gsweb.cgi/login?o=dnclcdr&s=id=%22091NTU00312007%22.&searchmode=basic

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