

# Introduction to biodiversity information & GBIF



Francisco Pando  
GBIF Spain



NATIONAL MUSEUMS OF KENYA  
WHERE HERITAGE LIVES ON

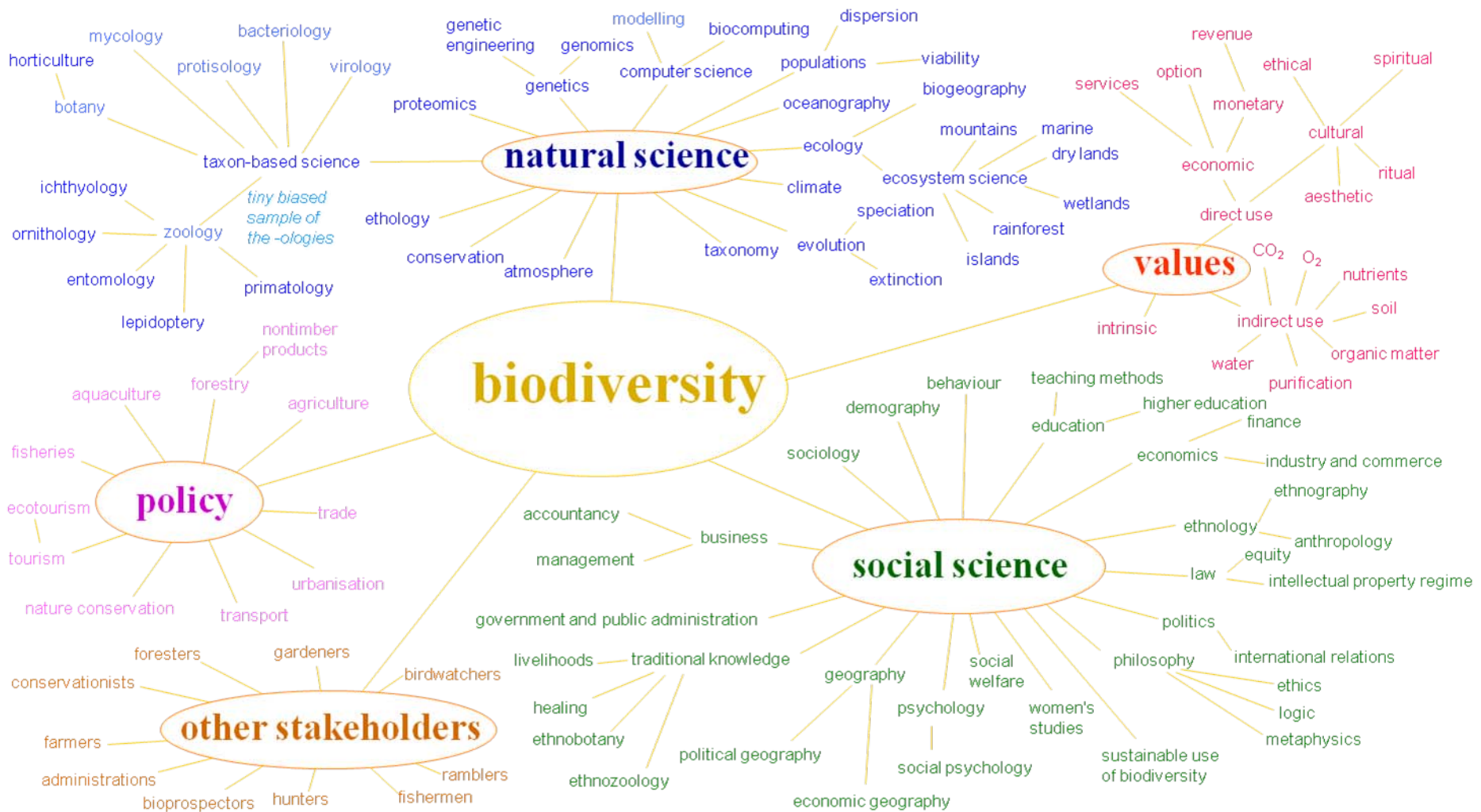
**KENBIF Stakeholder  
Consultation Workshop**  
Nairobi, 8th to 9th June 2011

# What Biodiversity Information

- **Genetic variability:** refers to the genetic differences that occur within a particular species that can be passed along to offspring.  
↓
- **Species diversity:** refers to the variety of species that occur within a particular area. Collectively, all of the individuals of a particular species in a particular area form a population.  
↓
- **Community diversity:** refers to the associations of species within an area. These associations, also called biological communities, are the living components of ecosystems.  
↓
- **Landscape/regional diversity:** refers to the variety of ecosystems and communities that can be found within the landscape.

After Noss & Cooperrider (1994), Decker *et al.* (1991) and Riley & Mohr (1994)

# Biodiversity has multiple connections



De: Martin Sharman, Comisión Europea

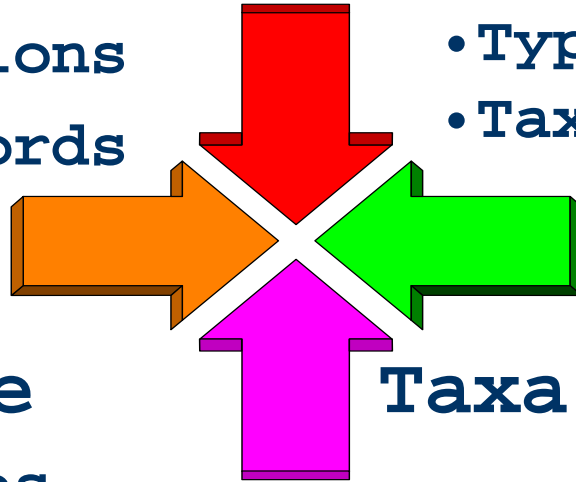
# The nature of biodiversity information

## Primary data

- Specimens
- Observations
- Lit. records

## Names

- Accepted & synonyms
- Type information
- Taxonomic schemas



## Literature

- References
- TL2 & BPH
- Key-words

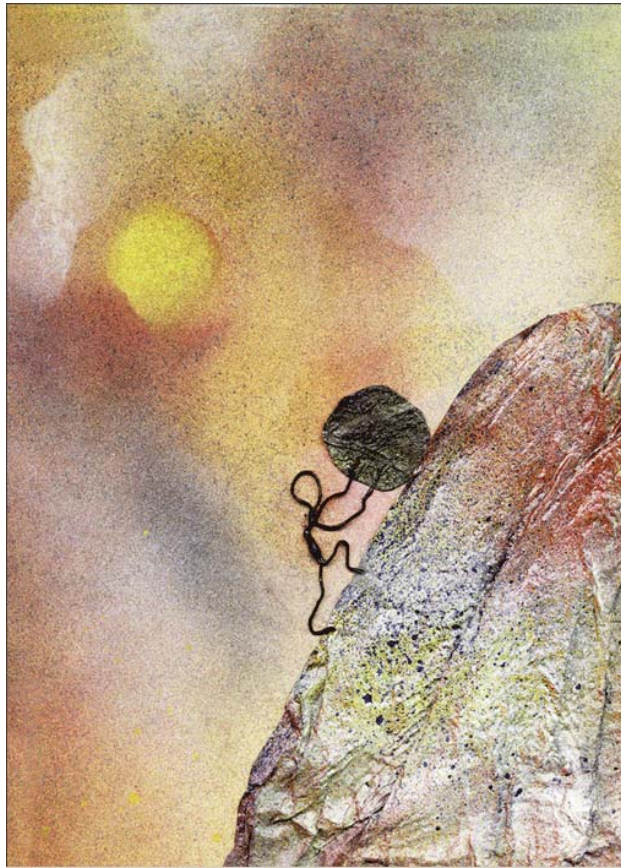
## Taxa

- Descriptions, identification keys, conservation, uses, distribution, habitat, etc.

Adapted from:

Leenhouts, *Regnum Veg.* 58. 1968.

# To share for what



© The Art of  
Steven Nelson

HEYWOOD, V.H. (1974). Systematics-the stone of Sisyphus. Biol. J. Linn. Soc.  
6(2): 169-178.

# To share data for what

## Traditional Model

1. Data gathering (field work, lab work, lit. collation)



2. Research/ analysis



3. Information dissemination: publication

Change the traditional model ⇒

- promote
- support
- recognize



## New Model

1. Data gathering (field work, lab work, lit. collation)  
**Databases, online resources**



2. Research/ analysis



3. Information dissemination: publication  
-paper & **digital, databases**

- efficiency
- Communication (science for all, not just for scientists)

# Initiatives

- **Standards**

- TDWG (Biodiversity Information Standards / Taxonomic databases Working Group)

- **Content**

- **Primary data**

- GBIF

- **Names**

- Species 2000, Catalogue of Life

- **Taxa**

- Encyclopedia of Life (EoL)

- **Literature**

- Biodiversity Heritage Library (BHL)



# What is GBIF ?

An international *megascience* organization with the overall mission of making the world's biodiversity data freely and universally available via the Internet, and especially to:

- share primary scientific biodiversity data for science, society and a sustainable future
- Intended users are scientists, decision makers, educators, the general public, environmental managers, ...





# GBIF Mission

...make the world's  
biodiversity data **freely**  
and universally  
**available** via the  
Internet.

To date: 270 million biodiversity  
data records readily available  
([data.gbif.org](http://data.gbif.org))

# GBIF was established ...

- ... to partner with other biodiversity organisations
  - e.g., the Convention on Biological Diversity
- ... to help overcome the digital divide
- ... to share (repatriate) biodiversity data with countries of origin
- ... to help deal with the unequal distribution of biodiversity information

# Short GBIF history

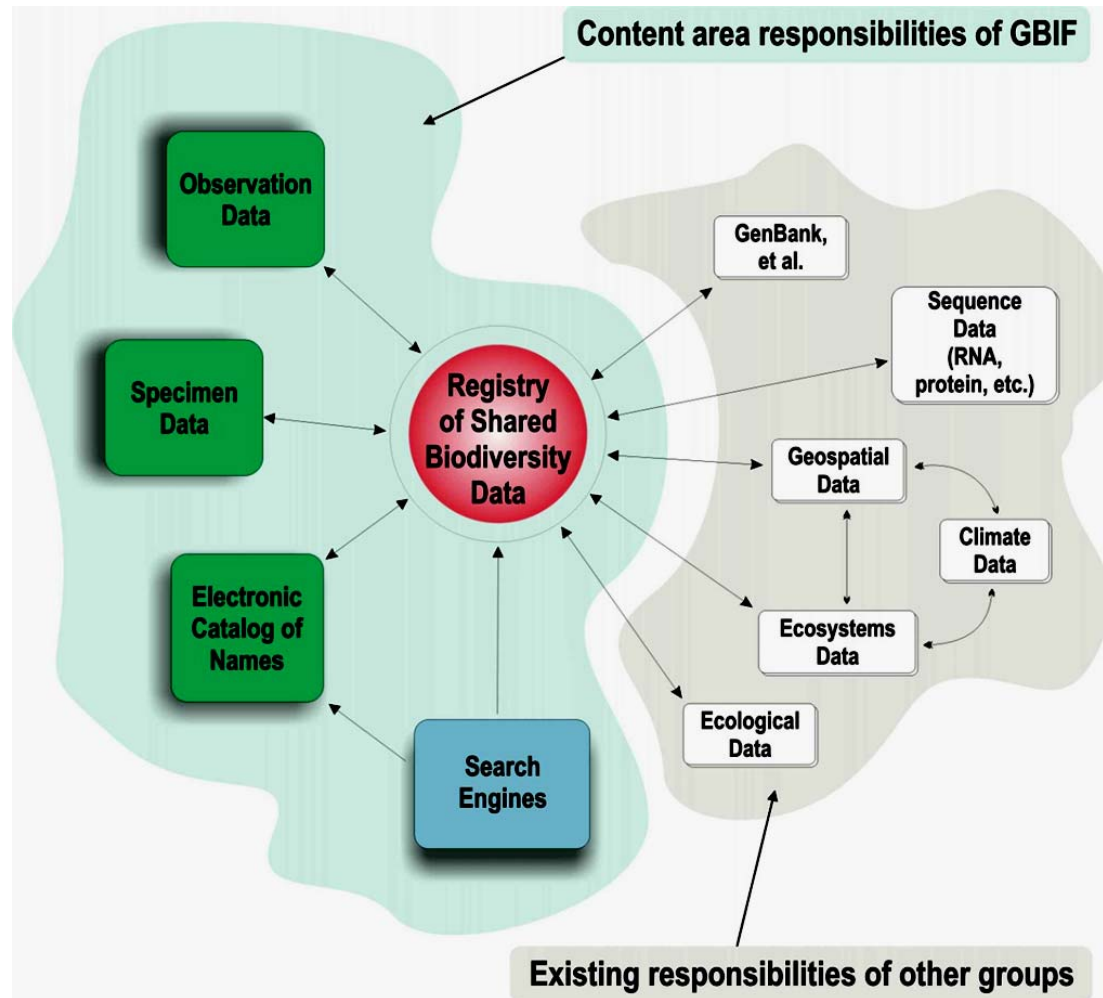
- January 1999 - Idea was proposed by Megascience Forum of OECD
- June 1999 - Endorsed by OECD Science Ministers
- March 2001 - GBIF was established
- In June 2001, Denmark was chosen as site of GBIF Secretariat
- 2003: First Work Plan, first calls for projects and contracts
- 2006: Second phase of GBIF: from prototype to operational system
- 2010/2011: Third phase: Towards a model indefinite in time and decentralized

# GBIF Themes

- Content
  - Natural history collections, projects, initiatives producing and gathering biodiversity information
  - Electronic catalogue of names
- Informatics
  - Technology and data interoperability
- Participation
  - National nodes
  - International conventions
  - Centers and projects with biodiversity information
  - Capacity building



# GBIF's focus: biodiversity data



El catálogo electrónico de nombres de organismos conocidos para la ciencia posibilita el enlace entre muchos tipos de bases de datos biológicas y no biológicas

# GBIF principles

- Participant entities retain control on their data and their intellectual property rights are recognized.
- Collaborate with initiatives already established in common objectives and to avoid effort duplication.
- Built on a distributed ICT architecture based on open standards.

Portal: <http://data.gbif.org>

**GLOBAL BIODIVERSITY INFORMATION FACILITY**

**SPECIES COUNTRIES DATASETS OCCURRENCES SETTINGS ABOUT**

```
<?xml version="1.0" encoding="UTF-8
<response xmlns="http://rs.tdwg.org/t
<header>
<source accesspoint="http://145.18.162/
<software name="TapirLink" version="0.2(re
```

... free and open access to biodiversity data

**Search**  
species/country/dataset

Search

**Welcome to the GBIF Data Portal**

Access millions of data records shared via the GBIF network. To learn how to use this site, please see *About*. To tune this site for smaller displays, see *Settings*.

**Explore Species**

Find data for a species or other group of organisms.

**Species**

Information on species and other

**Explore Countries**

Find data on the species recorded in a particular country.

**Countries**

Information on the species

**Explore Datasets**

Find data from a data provider, dataset or data network.

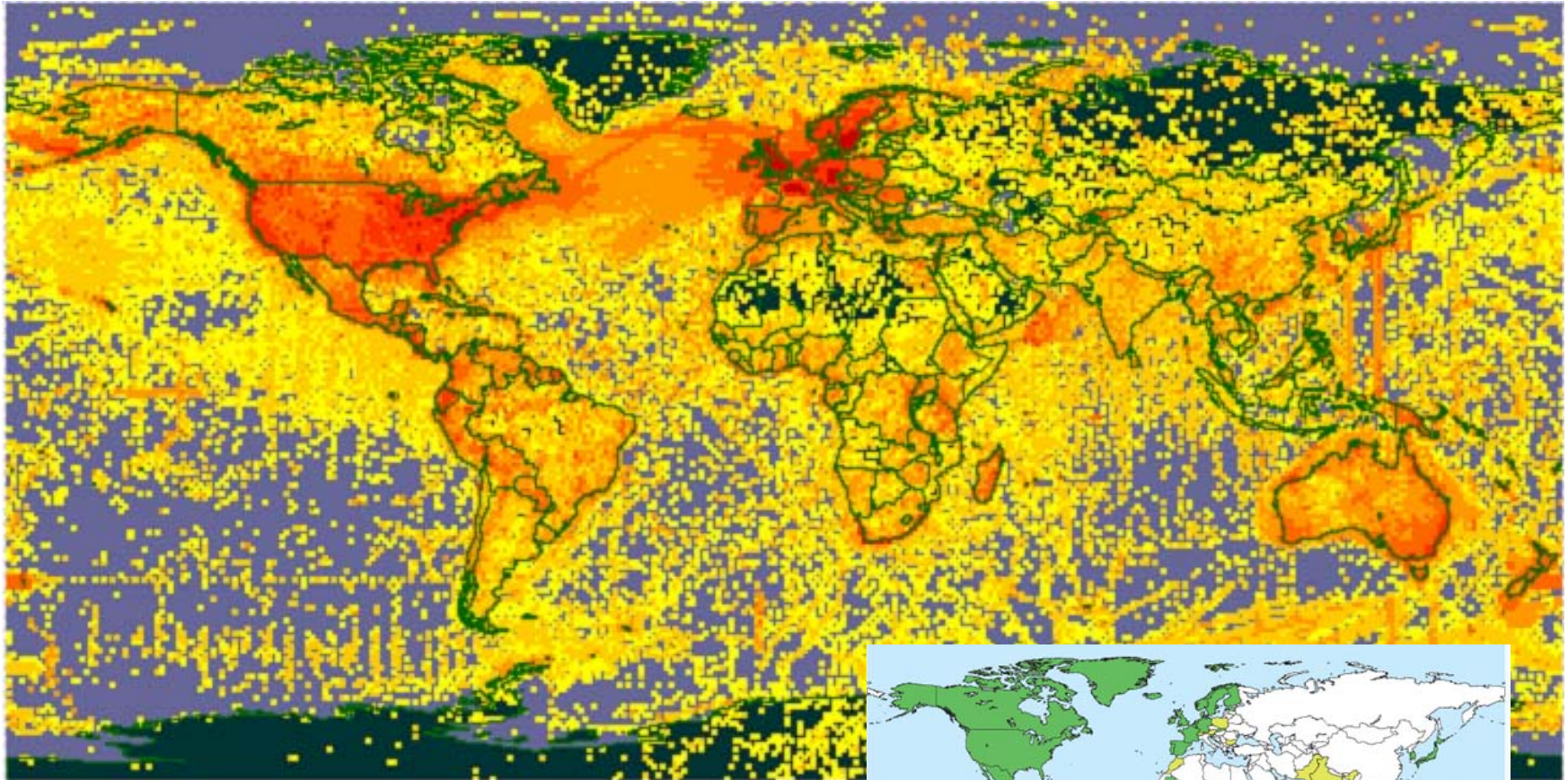
**Datasets**

Information on the data providers.

gbif.es



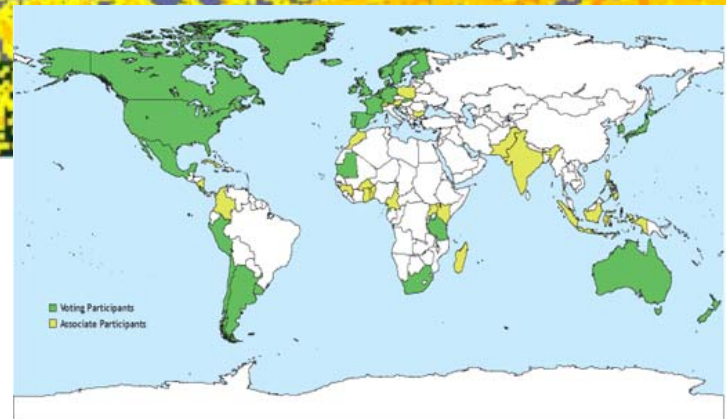
**GBIF as a whole:** <http://data.gbif.org>



**10.478 databases**

**267.173.379 records**

**55 countries, 45 organizations**





# Species 2000, Catalogue of Life

Species 2000 - Welcome to Species 2000 website - Microsoft Internet Explorer provided by SINET

http://www.species2000.org/

Google

Species 2000 - Welcome to Species 2000 w...

# Species 2000

indexing the world's known species



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Home

## One Million Species Symposium

Registration is now open for the One Million Species Symposium at the University of Reading on the 29th March. Click [here](#) for further details.

## Welcome to the Species 2000 website and the Species 2000 and ITIS 'Catalogue of Life'



# ITIS

Please use the menu of the left to browse for more information about the Species 2000 project or use the links below to search the **Species 2000** and **ITIS 'Catalogue of Life'**.

### Annual Checklist 2006

- Species 2000 & ITIS assembly of 37 taxonomic databases as a fixed annual edition



# Before continuing

- Encyclopedia of Life (EoL) develops two topics originally included in the GBIF Conceptual Plan:
  - A “Speciesbanks”: web pages containing any information on biological species
  - A “Biodiversity Digital library” now being undertaken by the “Biodiversity heritage Library” project

# Encyclopedia of Life (EoL)

## Taxa



<http://www.eol.org/index>

Inspired by  
E.O. Wilson





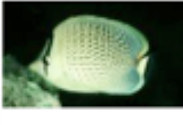
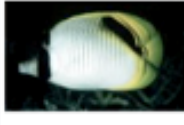


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**eol** WELCOME TO THE ENCYCLOPEDIA OF LIFE  
You are not logged in. Please [login](#) or [create an account](#).

Encyclopedia of Life

### Explore

[more species](#)


 <p><a href="#">Valenciennesa longipinnis</a> (Lay &amp; Bennes, 1839) Long-finned goby</p>	 <p><a href="#">Ophichthus spinicauda</a> (Norman, 1922) Antillean snake eel</p>	 <p><a href="#">Cheetodon guttafissimus</a> Bennet, 1833 Peppered butterflyfish</p>	 <p><a href="#">Cheetodon oxycephalus</a> Bleeker, 1853 Spot-nape butterflyfish</p>	 <p><a href="#">Brosimophycis marginata</a> (Ayres, 1854) Red brotula</p>	 <p><a href="#">Gymnothorax javanicus</a> (Bleeker, 1859) Giant moray</p>
--	--	--	--	--	--

### What is EOL?

Welcome to the first release of the Encyclopedia of Life portal. This is the very beginning of our exciting journey to document all species of life on Earth.

Comprehensive, collaborative, ever-growing, and personalized, the Encyclopedia of Life is an ecosystem of websites that makes all key information about all life on Earth accessible to anyone, anywhere in the world.

### Featured



[Pissodes strobi](#) (Peck)  
White pine weevil

### New To The Site?

- [Video Tour](#)
- [Frequently Asked Questions](#)

### Help Us

EOL is an unprecedented global effort and we want you to be a part of it. Natural history museums.

# Species page (1/2)

HOME

PREFERENCES

LANGUAGE : EN

FEEDBACK

PRESS ROOM

USING THE SITE

ABOUT EOL



Encyclopedia of Life

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SHOWING: [ALL INFORMATION](#)

  
 Names  Tags  Full-text

FIND

## *Grammia gibsoni* McDunnough 1937

*Gibson's Tiger*

Species recognized by GW Beccaloni, MJ Scoble, GS Robinson (†) & B Pitkin, [The Global Lepidoptera Names Index](#) in 

IUCN RED LIST STATUS: **NOT EVALUATED**

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Species 2000 & ITIS Catalogue of Life: Annual

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[Noctuoidea](#) +

[Arctiidae](#) +

[Grammia](#) +

[Grammia gibsoni](#) McDunnough 1937

[Archaea](#) +

[Bacteria](#) +

[Chromista](#) +

[Fungi](#) +

[Plantae](#) +

[Protozoa](#) +

IMAGES (1)



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SUPPLIER: University of Alberta



# Species page (2/2)

**Grammia gibsoni (male)**  
S. Saskatchewan River s. Empress 12-VIII-2001

SUPPLIER: [University of Alberta](#)

Museums 

SOURCE: [E.H. Strickland Entomological Museum](#)

[Protozoa +](#)

[Viruses +](#)



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▶ Habitat

▶ Trophic Strategy

### Life History and Behavior

▶ Cyclicity

### Conservation

▶ Conservation Status

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## COMPREHENSIVE DESCRIPTION



### General Description

#### SOURCE AND ADDITIONAL INFORMATION



AUTHOR [Schmidt, B. C.](#)

SOURCE [E.H. Strickland Entomological Museum](#)

SUPPLIER [University of Alberta Museums](#) 

RIGHTS [University of Alberta Museums](#)

HOLDER

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SOURCE URL [View original data object](#)

INDEXED [January 30, 2010](#)

The absence of white markings along the forewing veins, broad transverse bands and long antennal pectinations distinguish members of this species complex. It is uncertain if [Grammia geneura](#) (Strecker), [G. superba](#) (Stretch), [G. nevadensis](#) (Grote & Robinson) and [G. gibsoni](#) (McDunnough) are all the same variable species, or if several species are involved.



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## EXPLORE



[Monomorium sechellense](#)  
[Emery, 1894](#)



[Gonialosa whiteheadi](#)  
[Wongratana, 1983](#)  
Southern Burmese  
gizzard shad



[Geococcyx californianus](#)  
[Lesson, 1829](#)  
Greater roadrunner



[Paranemonia](#)  
[vouliagmeniensis](#)  
[Drummen, England and](#)



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### Now Online

[View latest BHL materials scanned by Internet Archive at BHL partner libraries.](#)

#### American Museum of Natural History (New York)

- [American Museum Novitates](#), v1 - , 1921 - present
- [Anthropological Papers of the American Museum of Natural History](#), v.1- , 1907 - present
- [Bulletin of the American Museum of Natural History](#), v.1- , 1881 - present
- [Memoirs of the American Museum of Natural History](#), v.1-15, 1893 - 1930.

• [Darwin Digital Library of Evolution](#)

• [Digital Library Project](#)

The AMNH Digital Library was launched in 1999 to develop an integrated database of library resources and natural history collections. The digital library will enable scientists, scholars, and educators working anywhere in the world to study unique and rare research materials from the Museum's Library and scientific collections.

• [American Museum Congo Expedition, 1909-1915](#)

#### The Field Museum

- Forthcoming

# BHL: page view example

Boletín - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://www.archive.org/stream/boletn351918inst#page/n5/mode/2up

GBIF.ES - Infraestructura ... Encyclopedia of Life Species 2000 - Annual Chec... Boletín

Zoom: Auto Page: n5

PRÓLOGO

Al asumir la Jefatura del Departamento de Estudios Geológicos y Exploratorios y la Dirección del Instituto Geológico de México, aconteció terminado, y así en su totalidad impreso, el escrito del Sr. Ingeniero don Miguel Buitrago, al que, por acuerdo del señor Secretario de Industria, Comercio y Trabajo, serviría estas líneas de prólogo.

Fue la idea de no aconsejar, al Sr. Ingeniero don Ezequiel Orozco, que se hiciera una recopilación de las opiniones técnicas publicadas sobre la riqueza petrolífera de México, ya para tener un conjunto sintético que sirviera de base a estudios posteriores, ya para publicarla, con las ediciones pertinentes, si tal cosa hubiera sido oportuna.

Habiéndolo separado el Sr. Orozco de la Dirección del Instituto desde principios de septiembre de 1917, y no habiéndolo yo venido a substituirlo sino hasta el 13 de abril de 1918, en ese intervalo de tiempo no podía haber quedado en suspenso las actividades del Instituto, y de allí que la primera parte de la obra "El Petróleo en la República Mexicana" hubiera sido concluida y era hoy la luz pública, sin haber studiado a otro plan que el que se autorizó oportunamente adoptar.

Ahora que ya está formulado el programa al que se sujetará la labor del Instituto Geológico, en lo referente al estudio del petróleo en México, es pertinente bosquejarlo y gracias la utilización que, dentro de ese programa, podrá tener el estudio que hoy se publica.

No es de extrañar que trabajo de tan capital importancia se iniciara años después de que México se reveló como importante productor de aceite mineral, si se tiene en cuenta que apenas hace dos años que el país ha entrado en la vía de su reconstrucción social y política, después de haber asistido a una lucha por ampujar regímenes viejos y reaccionarios, que no podían impulsar en dicha forma, como hoy se hace, el estudio geológico de las riquezas de nuestro subsuelo.



# BHL: search example



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[Book of the Week: Deadly](#)

## Search Results for "Passiflora" [\(New Search\)](#)

[Titles](#) found : 1

[Authors](#) found : 0

[Names](#) found : 100

[Subjects](#) found : 2

### Titles

1. [The American species of Passifloraceae, by Ellsworth P. Killip.](#)  
Publication info: [Chicago]1938.  
Contributed By: University of Illinois Urbana Champaign

### Authors

### Names

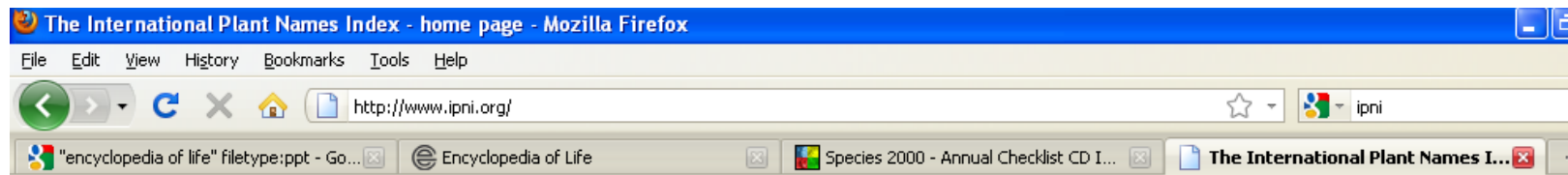
Biodiversity Heritage Library uses *taxonomic intelligence* tools, including [TaxonFinder](#) developed by [uBio.org](#), to locate, verify, and record scientific names located within the text of each digitized page. **Note:** The text used for this identification is uncorrected OCR so may not include all results expected or visible in the page.

1. [Passiflora](#) (8780)
2. [Passiflora acerifolia](#) (25)
3. [Passiflora actinia](#) (25)
4. [Passiflora acuminata](#) (3)
5. [Passiflora acutissima](#) (2)

# What else?

- There is more than just these four initiatives.
- The key point is to demonstrate that data publishing and sharing is relevant for making better science, conservation and management
- Now it is the moment to part of this movement: publish data, publish them standardized
- What is relevant depends on each case

# International Name Plant Index (IPNI)



## The International Plant Names Index

● Search Plant Names

● Search Authors

● Search Publications

### IPNI Overview

- [About the Index](#)
- [About the data](#)
- [Information for authors](#)
- [IK chronology](#)
- [Standardization](#)
- [Data curation](#)
- [FAQs](#)
- [Mission Statement](#)

### Search the Data

- [Plant Names](#)
- [Authors](#)
- [Publications](#)
- [By additional terms](#)

### Search Tools

- [Install browser plugin](#)
- [About browser plugin](#)
- [Toolbar buttons](#)

## About IPNI

The International Plant Names Index (IPNI) is a database of the names and associated basic bibliographical details of seed plants, ferns and fern allies. Its goal is to eliminate the need for repeated reference to primary sources for basic bibliographic information about plant names. The data are freely available and are gradually being standardized and checked. IPNI will be a dynamic resource, depending on direct contributions by all members of the botanical community.

IPNI is the product of a collaboration between [The Royal Botanic Gardens, Kew](#), [The Harvard University Herbaria](#), and the [Australian National Herbarium](#)

## NEWS - August 2010

- If you would be interested in trying out a bibliographic tool that will take you from a detailed plant name record in IPNI to the protologue page if available in [BHL](#), please [let us know](#).

Limitations in the levels of standardization require a bit of lateral thinking and wildcard use, but if you are familiar with the quirks of the literature and are prepared to help the tool along a bit, you may like to give it a try. We find it really useful.

- The IPNI database is live and updated every day. From August 2010 we are displaying the current [number of records](#) in each of the IPNI databases. On [the same page](#) you can see how many names are being



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<http://www.morphobank.net/Browse/>

- Image
- Taxon hierarchy
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News and Updates

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Morphobank is planning on extending our copyright field to include a [Creative Commons](#) license with every image. It is important to apply these licenses to the images on Morphobank for a number of reasons:

**1.** This license ([Attribution-Noncommercial-Share Alike 3.0 Creative Commons by-nc-sa](#)) best reflects the copyright ...



(Posted:01-14-08)

### Morphobank at ESA and SCAMIT in San Diego

Next week (December 9-12, 2007) at the 55th Annual Entomological Society of America meeting Morphobank is participating in the symposium [From Field to Screen: Digital Imaging Technology in Entomology](#) The symposium organizers Matt Buffington and Katia



Internet

# ... And this far from being everything

GBIF, EoL, Taxonomic  
revisions, biotic  
surveys

Published species  
descriptions

Description/revision  
not yet published

Data not yet released

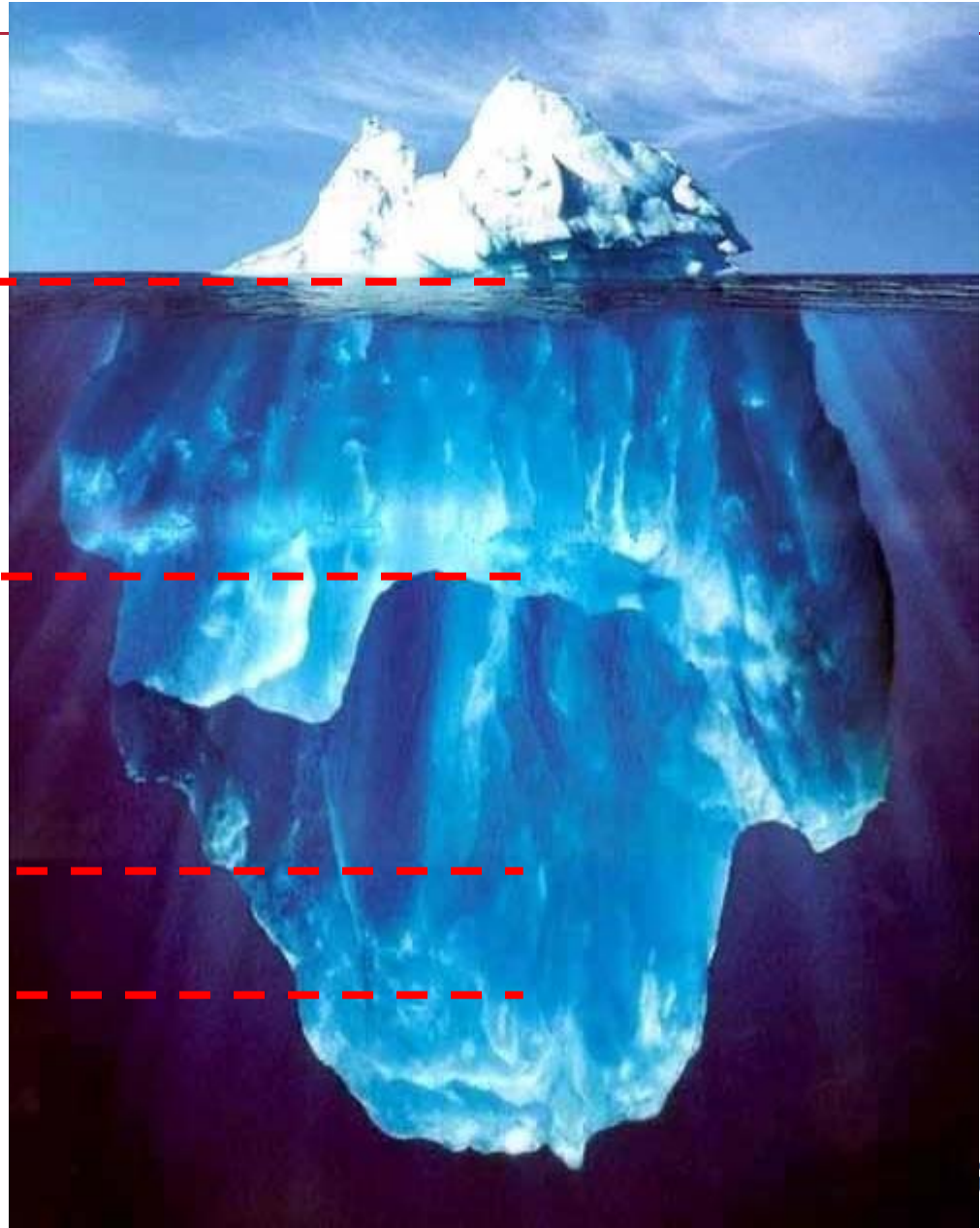
Not yet described

Not yet in specimen  
catalog

Not yet curated

Species to be

collected



# At your command

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