

# Bioschemas/Schema.org: marking up biodiversity web sites\*

Session Web Sémantique INSIDE : MNHN / CNRS / BRGM  
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F. Michel

Université Côte d'Azur, CNRS, Inria, I3S, France



\* Adapted from:

Unleash the Potential of your Website! 180,000 webpages from the French NHM marked up with Bioschemas/Schema.org biodiversity types.

F. Michel, O. Gargominy, B. Ledentec and The Bioschemas Community.  
TDWG 2020. <https://doi.org/10.3897/biss.4.59046>

# schema.org : semantic markup for resources on the internet

Collaborative community project founded by



Define a common vocabulary to **markup resources**

- Structured data makes resources understandable to search engines
- Improve ranking, discoverability
- Provide informative summarizations

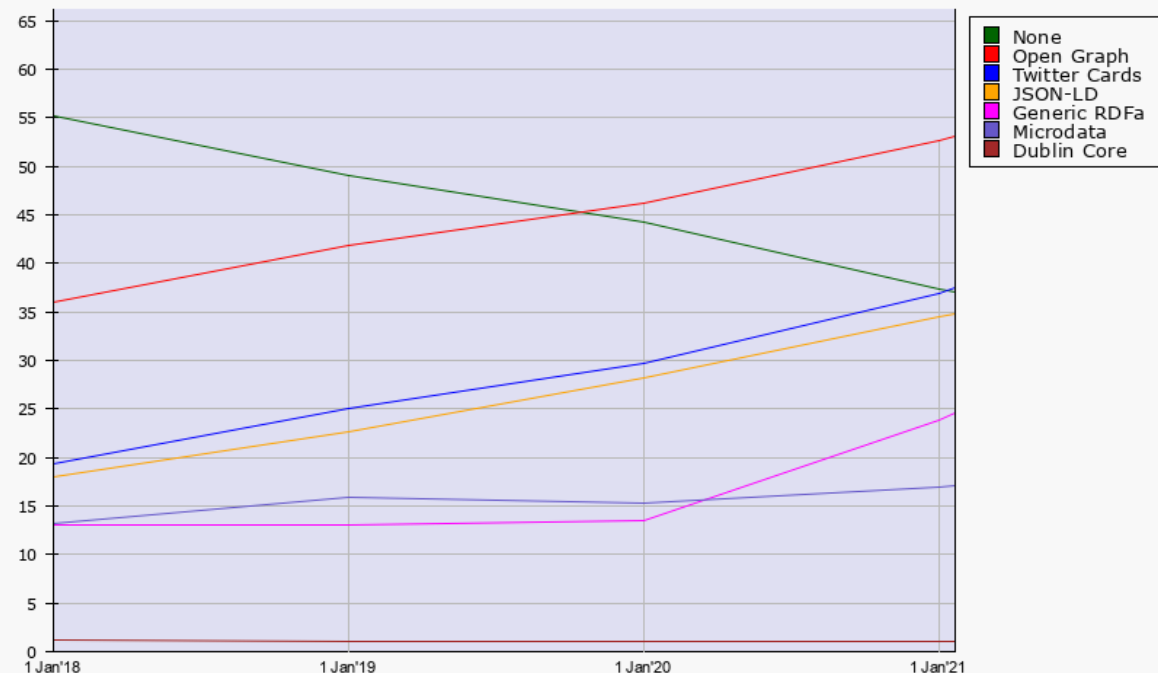
Markup formats



Microformats

RDFa

Microdata



Usage of structured data formats for websites, 21 Jan 2021, W3Techs.com

Source: [https://w3techs.com/technologies/history\\_overview/structured\\_data/all](https://w3techs.com/technologies/history_overview/structured_data/all)

Environ 13 300 000 résultats (0,52 secondes)

www.narwhal.es > ...

### Narwhal Inflatable craft - Bateaux pneumatique, semi-rigide ...

Bateaux spécialisés. Fabricant de bateaux pneumatique, bateaux pneumatique rigide, bateaux pneumatique semi-rigide, bateaux plaisance, bateaux ...

[Work boat](#) · [Accessoires](#) · [Consoles rabattables](#) · [Wb fisher](#)

www.mbmarine.fr > semi-rigide-narwhal

### Vente bateaux semi-rigide Narwhal au Crouesty dans le ...

Vente et location de semi-rigide **Narwhal** au Crouesty. MB Marine vous propose la gamme de pneumatique avec une motorisation hors-bords Yamaha.

pneumag.com > 25-narwhal

### Bateau Pneumatique | Essais (test) Narwhal

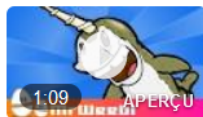
Tous les essais **Narwhal** (WB 550, HD 580, Fast 1100, Sun H520 Plus, SP 750...). Pneumatique Magazine: essai et descriptif du bateaux pneumatique.

www.annoncesbateau.com > Bateau > Narwhal

### Narwhal à vendre | Annonces du Bateau

Quel est le meilleur **Narwhal**? Parmi les modèles **Narwhal** les plus connus actuellement, on trouve HD 580, HD 550 et WB 620. Bateaux **Narwhal**.

### Vidéos



Narwhals : animated music video : MrWeebl

YouTube · Weebl's Stuff  
22 févr. 2009



Plus d'images

## Narval

Animal



Le narval ou licorne des mers est une espèce de cétacés de la famille des Monodontidae vivant dans l'océan Arctique. Le mâle possède une unique défense torsadée, issue de l'incisive supérieure gauche, qui peut mesurer jusqu'à 3 mètres de long. L'animal lui-même a une longueur de 4 à 5 mètres. [Wikipédia](#)

**Nom scientifique :** Monodon monoceros

**Longueur :** 5,1 m (Adulte) [Encyclopédie de la Vie](#)

**Statut de conservation :** Quasi menacé [Encyclopédie de la Vie](#)

**Poids :** 940 kg (Adulte) [Encyclopédie de la Vie](#)

**Période de gestation :** 14 mois [Encyclopédie de la Vie](#)

**Niveau trophique :** Carnivore [Encyclopédie de la Vie](#)

Habitat



Vitesse



Population



# Bioschemas: extension for Life Sciences

Community initiative built on top of Schema.org

## Aim

Improve resources discoverability and interoperability in LS

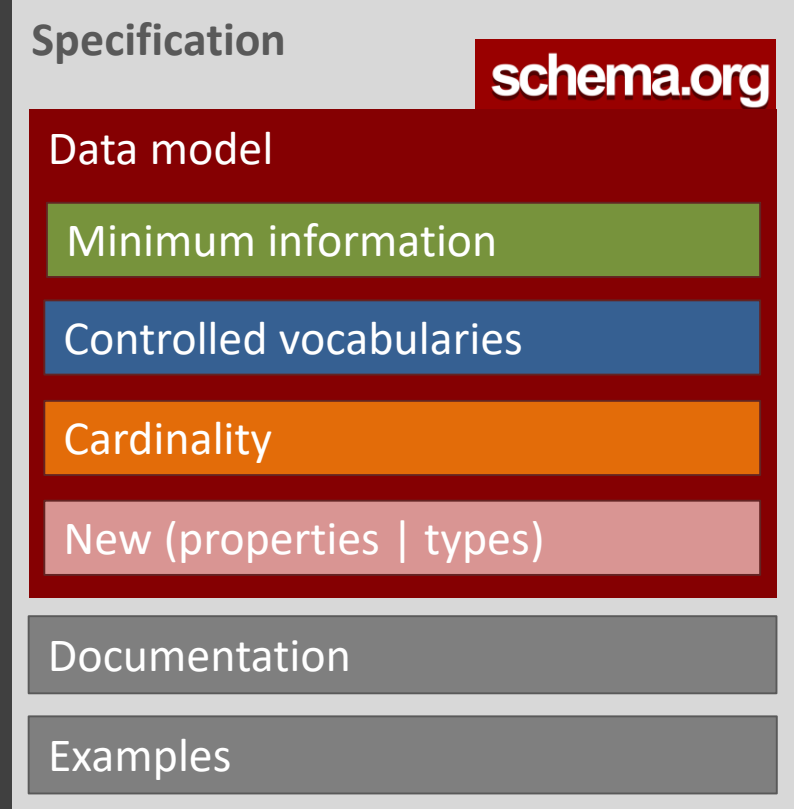
## Approach

Keep it **simple** (no complex domain ontology)

Provide **guidelines** on how to markup resources






- Minimum/recommended/optional properties
- Link to other vocabularies & domain ontologies

## Support software






# Taxon (type + profile)

<https://bioschemas.org/types/Taxon>  
<https://bioschemas.org/profiles/Taxon>

Property	Expected Type	Description	CD	Controlled Vocabulary	Example
<b>Marginality: Minimum.</b>					
<a href="#">name</a>	<a href="#">Text</a>	<p><b>Schema:</b> The name of the item.</p> <p><b>Bioschemas:</b> Currently valid (zoological) or accepted (botanical) name for that taxon, with authorship and date information if known.</p>			
<a href="#">taxonRank</a>	<a href="#">PropertyValue</a> <a href="#">Text</a> <a href="#">URL</a>	<p><b>Schema:</b> The taxonomic rank of this taxon given preferably as a URI from controlled vocabulary (e.g. the ranks from TDWG TaxonRank ontology or equivalent Wikidata URIs)</p>			
<b>Marginality: Recommended.</b>					
<a href="#">parentTaxon</a>	<a href="#">Taxon</a> <a href="#">Text</a> <a href="#">URL</a>	<p><b>Schema:</b> Closest parent taxon of the taxon in question. Inverse property: <a href="#">childTaxon</a></p> <p><b>Bioschemas:</b> Direct, most proximate higher-rank parent taxon</p>			
<a href="#">scientificName</a>	<a href="#">TaxonName</a>	<p><b>Schema:</b> A TaxonName representing the currently valid (zoological) or accepted (botanical) name for that taxon</p>			
<b>Marginality: Optional.</b>					
<a href="#">additionalType</a>	<a href="#">URL</a>	<p><b>Schema:</b> An additional type for the item, typically used for adding more specific types from external vocabularies in microdata syntax. This is a relationship between something and a class that the thing is in. In RDFa syntax, it is better to use the native RDFa syntax – the 'typeof' attribute – for multiple types. Schema.org tools may have only weaker understanding of extra types, in particular those defined externally.</p> <p><b>Bioschemas:</b> A Taxon type from a well known vocabulary, e.g. DarwinCore <a href="http://rs.tdwg.org/dwc/terms/Taxon">http://rs.tdwg.org/dwc/terms/Taxon</a> or <a href="http://rs.tdwg.org/ontology/voc/TaxonConcept#TaxonConcept">http://rs.tdwg.org/ontology/voc/TaxonConcept#TaxonConcept</a></p>			MANY 
<a href="#">alternateName</a>	<a href="#">Text</a>	<p><b>Schema:</b> An alias for the item.</p> <p><b>Bioschemas:</b> Scientific name, with authorship and date information if known, of a synonym of the currently valid (zoological) or accepted (botanical) name.</p>			MANY 
<a href="#">alternateScientificName</a>	<a href="#">TaxonName</a>	<p><b>Schema:</b> A TaxonName representing a scientific name, with authorship and date information if known, of a synonym of the currently valid (zoological) or accepted (botanical) name</p>			MANY 
<a href="#">childTaxon</a>	<a href="#">Taxon</a> <a href="#">Text</a> <a href="#">URL</a>	<p><b>Schema:</b> Closest child taxa of the taxon in question. Inverse property: <a href="#">parentTaxon</a></p> <p><b>Bioschemas:</b> Direct, most proximate lower-rank child taxa</p>			MANY 
<a href="#">description</a>	<a href="#">Text</a>	<p><b>Schema:</b> A description of the item.</p>			
<a href="#">dwc:vernacularName</a>	<a href="#">Text</a>	<p><b>Bioschemas:</b> A vernacular (common) name of the taxon</p>			MANY 

# TaxonName (type + profile)

<https://bioschemas.org/types/TaxonName>  
<https://bioschemas.org/profiles/TaxonName>

Home Getting Started Specifications Deploy & Develop Community					
Property	Expected Type	Description	CD	Controlled Vocabulary	Example
Marginality: Minimum.					
<b>name</b>	Text	<b>Schema:</b> The name of the item.  <b>Bioschemas:</b> A name of that taxon without authorship and date information	ONE		
Marginality: Recommended.					
<b>author</b>	Organization Person	<b>Schema:</b> The author of this content or rating. Please note that author is special in that HTML 5 provides a special mechanism for indicating authorship via the rel tag. That is equivalent to this and may be used interchangeably.  <b>Bioschemas:</b> Authorship and date information associated to this taxon name, formatted as per the nomenclatural rules	MANY		
<b>taxonRank</b>	PropertyValue Text URL	<b>Schema:</b> The taxonomic rank of this taxon given preferably as a URI from a controlled vocabulary - (typically the ranks from TDWG TaxonRank ontology or equivalent Wikidata URIs).	MANY		
<b>url</b>	URL	<b>Schema:</b> URL of the item.  <b>Bioschemas:</b> Link to the webpage associated to this taxon	ONE		

Taxon and TaxonName #309:

<https://github.com/BioSchemas/specifications/issues/309>

# Bioschemas work on biodiversity

Currently:

**Taxon, TaxonName**

*Links to DwC terms*

Future

**Specimen**

*Links to ABCD, Open Digital Specimen?*

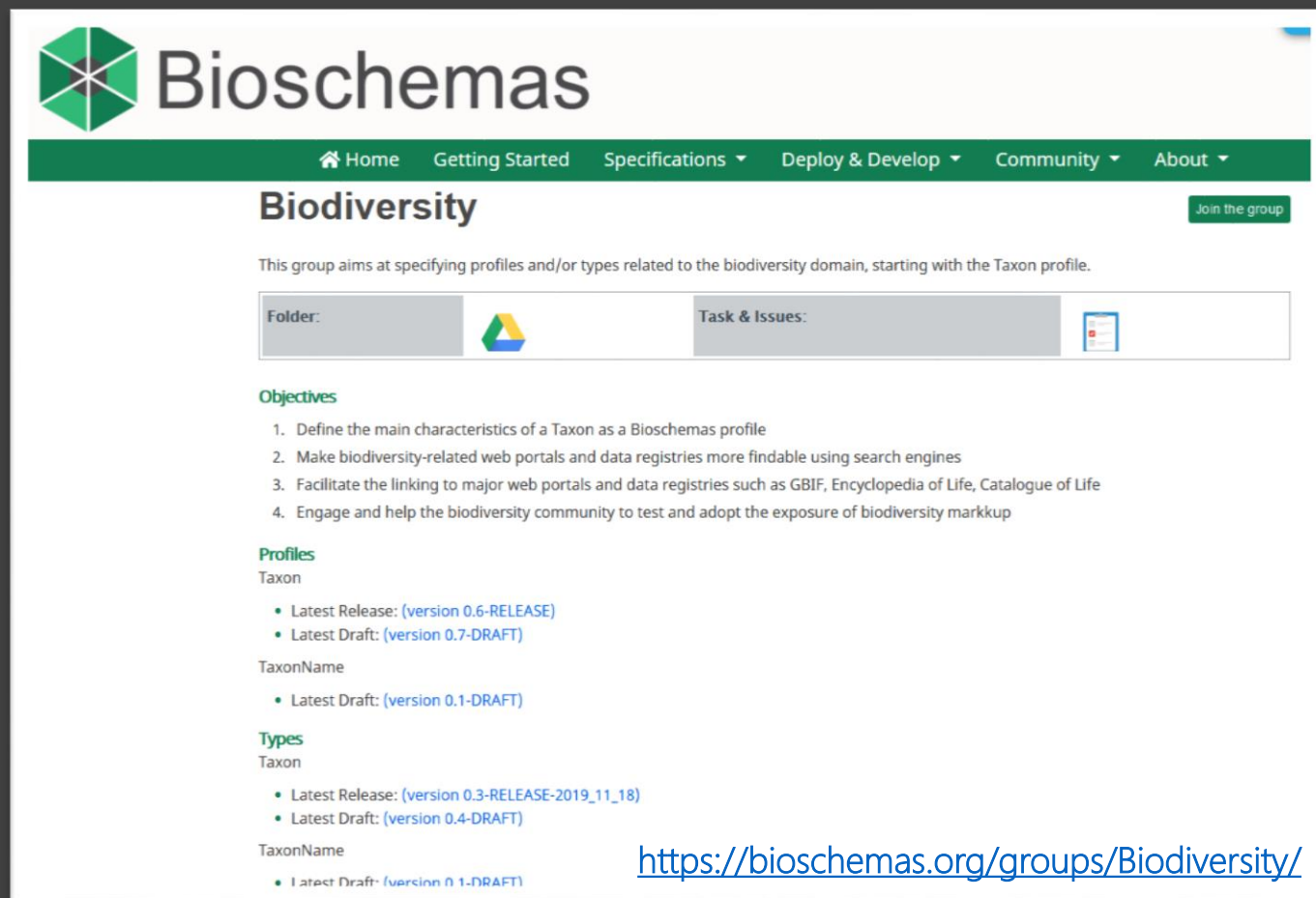
**Traits**

*Links to traits ontologies?*

**Occurrence**

*Links to DwC occurrences?*

...



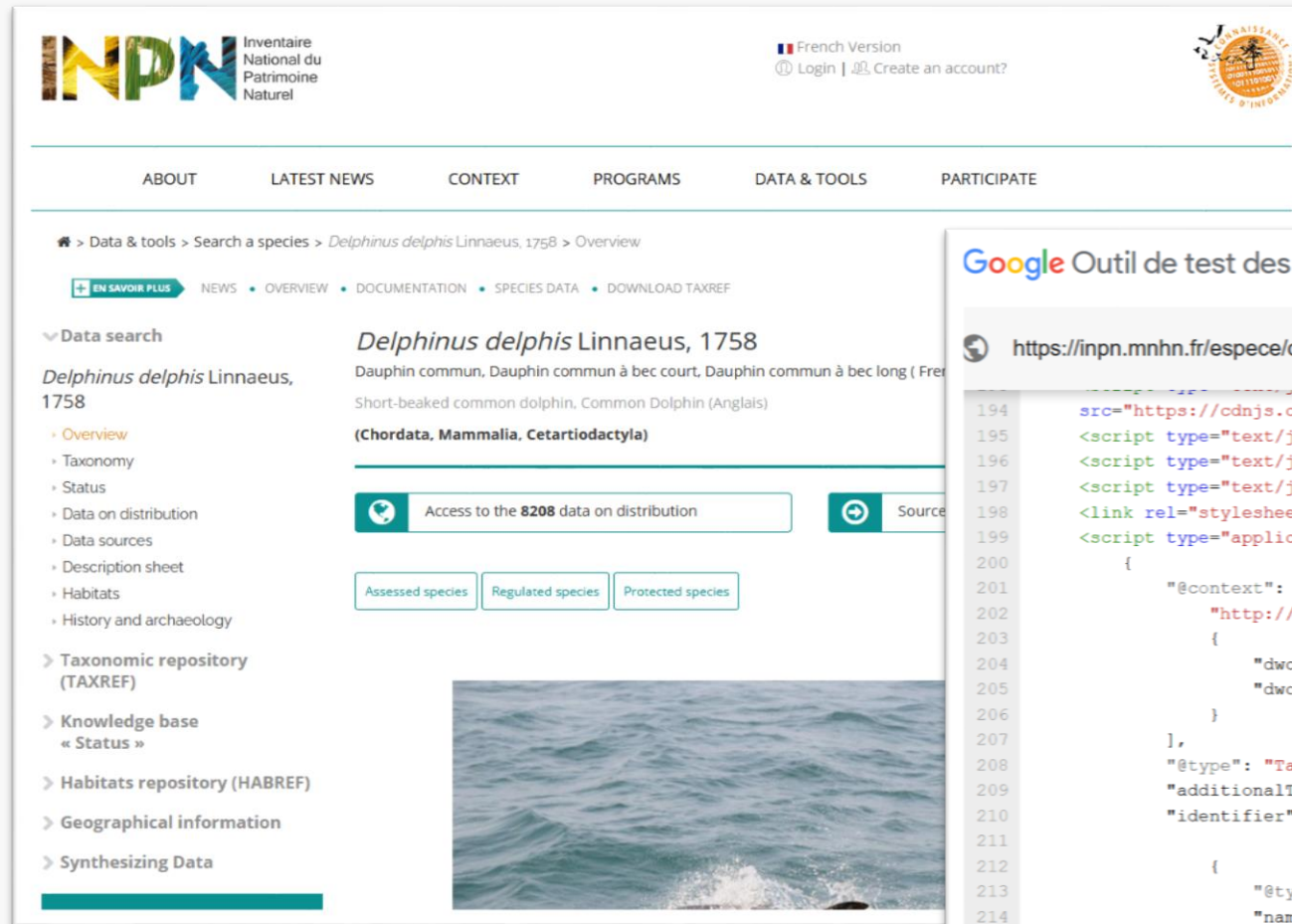
The screenshot shows the Bioschemas website with a green header. The main content area is titled 'Biodiversity' and includes a 'Join the group' button. Below the title, a paragraph states: 'This group aims at specifying profiles and/or types related to the biodiversity domain, starting with the Taxon profile.' There are two input fields: 'Folder:' with a Google Drive icon and 'Task & Issues:' with a calendar icon. The 'Objectives' section lists four points: 1. Define the main characteristics of a Taxon as a Bioschemas profile; 2. Make biodiversity-related web portals and data registries more findable using search engines; 3. Facilitate the linking to major web portals and data registries such as GBIF, Encyclopedia of Life, Catalogue of Life; 4. Engage and help the biodiversity community to test and adopt the exposure of biodiversity markup. The 'Profiles' section lists 'Taxon' with 'Latest Release: (version 0.6-RELEASE)' and 'Latest Draft: (version 0.7-DRAFT)'. The 'Types' section lists 'Taxon' with 'Latest Release: (version 0.3-RELEASE-2019\_11\_18)' and 'Latest Draft: (version 0.4-DRAFT)'. The 'TaxonName' section lists 'Latest Draft: (version 0.1-DRAFT)'. The URL <https://bioschemas.org/groups/Biodiversity/> is displayed at the bottom right.



# Deployment at NMNH Paris

180,000+ pages marked up with Taxon/TaxonName

Relatively inexpensive effort!



INPN Inventaire National du Patrimoine Naturel

French Version  
Login | Create an account?

ABOUT LATEST NEWS CONTEXT PROGRAMS DATA & TOOLS PARTICIPATE

Data & tools > Search a species > *Delphinus delphis* Linnaeus, 1758 > Overview

EN SAVOIR PLUS NEWS OVERVIEW DOCUMENTATION SPECIES DATA DOWNLOAD TAXREF

Data search

*Delphinus delphis* Linnaeus, 1758

Overview

Taxonomy

Status

Data on distribution

Data sources

Description sheet

Habitats

History and archaeology

Taxonomic repository (TAXREF)

Knowledge base « Status »

Habitats repository (HABREF)

Geographical information

Synthesizing Data

Access to the 8208 data on distribution

Source

Assessed species Regulated species Protected species

*Delphinus delphis* Linnaeus, 1758

Dauphin commun, Dauphin commun à bec court, Dauphin commun à bec long (Fre)

Short-beaked common dolphin, Common Dolphin (Anglais)

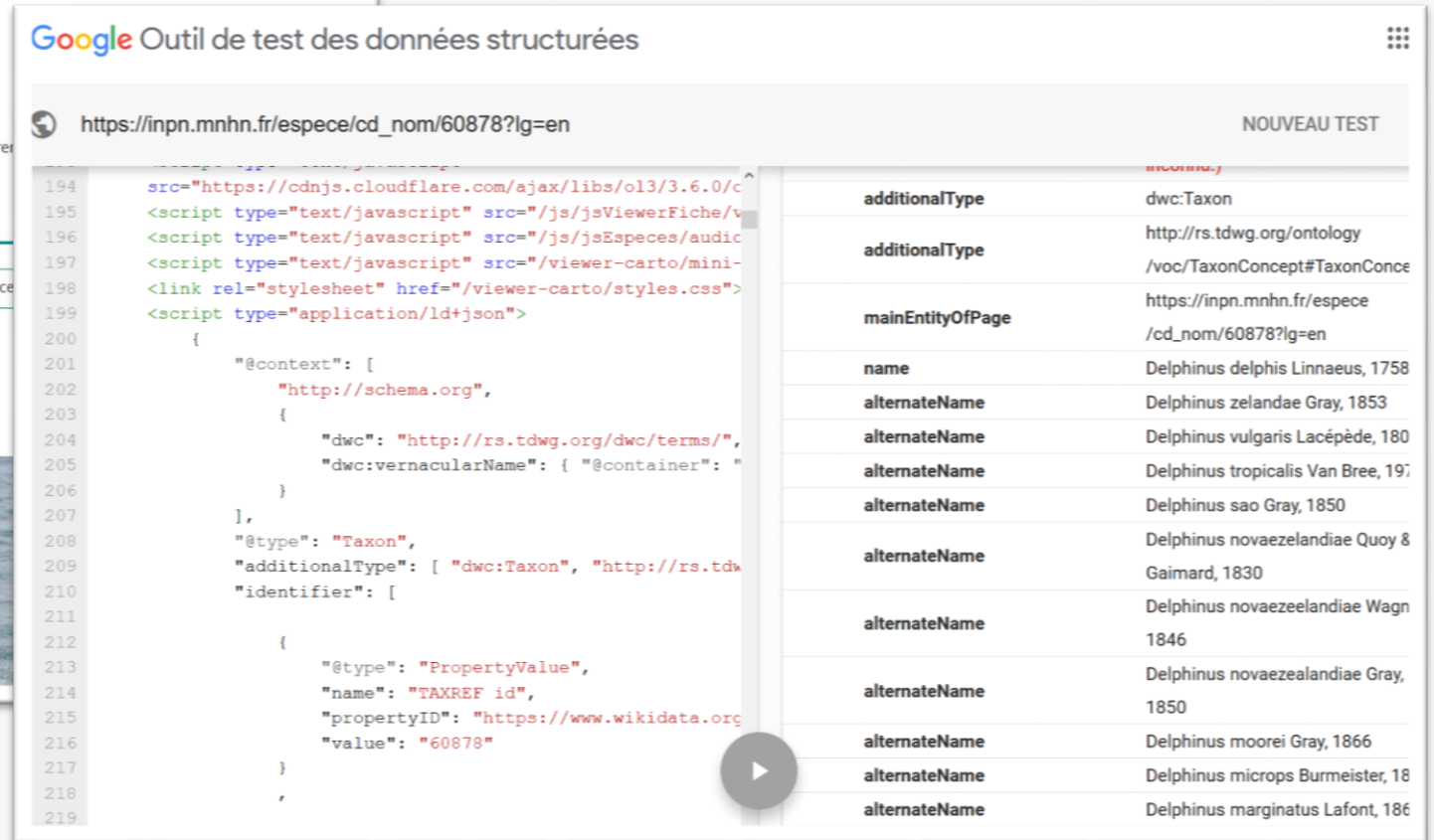
(Chordata, Mammalia, Cetartiodactyla)

Access to the 8208 data on distribution

Source

Assessed species Regulated species Protected species

[https://inpn.mnhn.fr/espece/cd\\_nom/60878?lg=en](https://inpn.mnhn.fr/espece/cd_nom/60878?lg=en)



Google Outil de test des données structurées

https://inpn.mnhn.fr/espece/cd\_nom/60878?lg=en NOUVEAU TEST

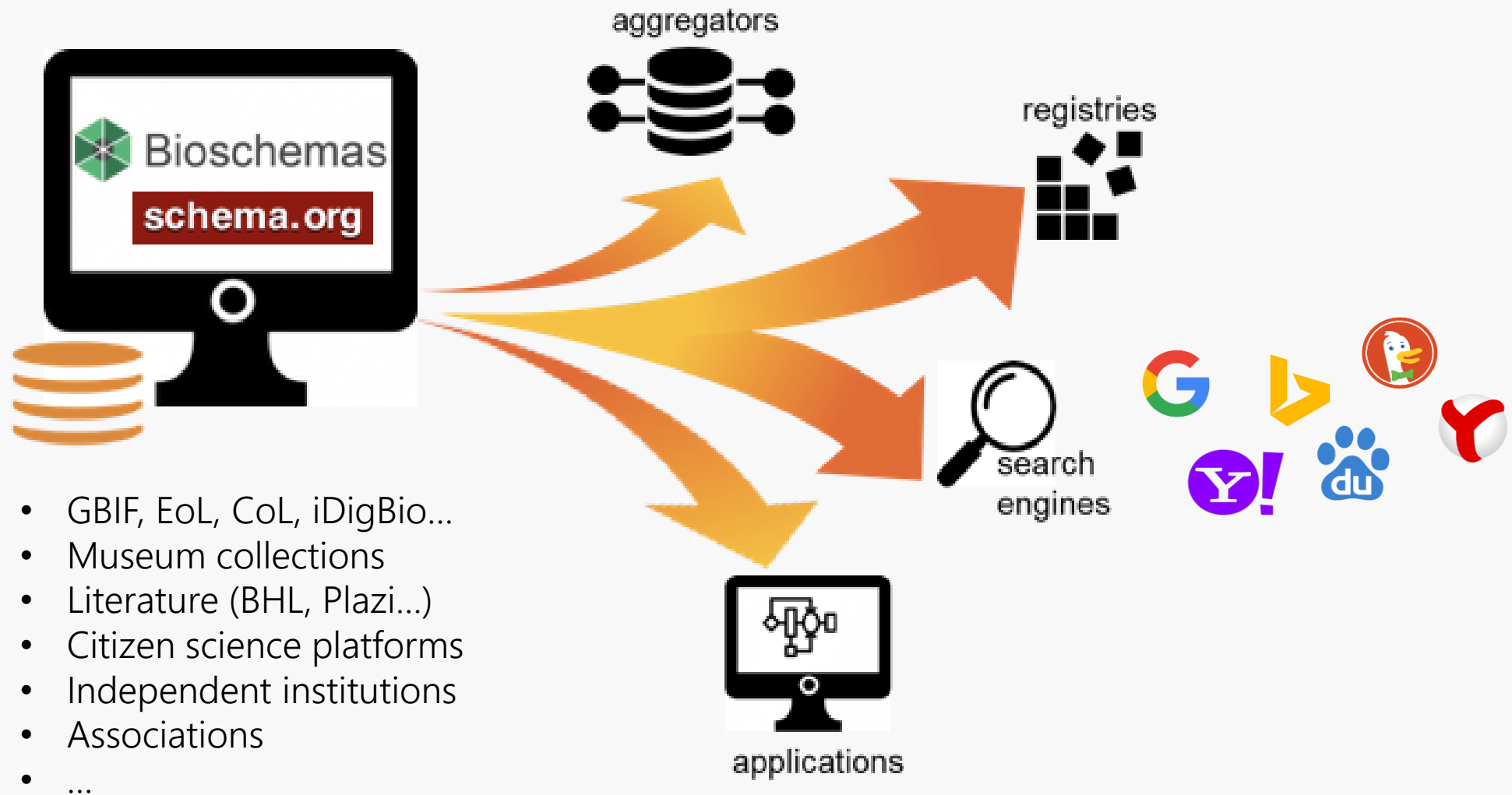
```
194 src="https://cdnjs.cloudflare.com/ajax/libs/ol3/3.6.0/c
195 <script type="text/javascript" src="/js/jsViewerFiche/v
196 <script type="text/javascript" src="/js/jsEspeces/audic
197 <script type="text/javascript" src="/viewer-carto/mini-
198 <link rel="stylesheet" href="/viewer-carto/styles.css">
199 <script type="application/ld+json">
200 {
201   "@context": [
202     "http://schema.org",
203     {
204       "dwc": "http://rs.tdwg.org/dwc/terms/",
205       "dwc:vernacularName": { "@container": "
206     }
207   ],
208   "@type": "Taxon",
209   "additionalType": [ "dwc:Taxon", "http://rs.tdw
210   "identifier": [
211     {
212       "@type": "PropertyValue",
213       "name": "TAXREF id",
214       "propertyID": "https://www.wikidata.org
215       "value": "60878"
216     }
217   ],
218   ,
219
```

additionalType	dwc:Taxon
additionalType	http://rs.tdwg.org/ontology
additionalType	/voc/TaxonConcept#TaxonConce
mainEntityOfPage	https://inpn.mnhn.fr/espece
	/cd_nom/60878?lg=en
name	Delphinus delphis Linnaeus, 1758
alternateName	Delphinus zelandae Gray, 1853
alternateName	Delphinus vulgaris Lacépède, 180
alternateName	Delphinus tropicalis Van Bree, 19
alternateName	Delphinus sao Gray, 1850
alternateName	Delphinus novaezelandiae Quoy &
alternateName	Gaimard, 1830
alternateName	Delphinus novaezeelandiae Wagn
alternateName	1846
alternateName	Delphinus novaezealandiae Gray,
alternateName	1850
alternateName	Delphinus moorei Gray, 1866
alternateName	Delphinus microps Burmeister, 18
alternateName	Delphinus marginatus Lafont, 186

<https://search.google.com/structured-data/testing-tool>



# Bioschemas for biodiversity... at scale



# Take-aways

Marking up webpages is cheap and can pay off!

- Increase discoverability, visibility
- Make “grey science” resources more visible
- ...

Let's have search engines do the job for us!

- Data integration at web scale
- Dataset search engines
- ...

# Thank-you

Unleash the Potential of your Website!

180,000 webpages from the French NHM marked up with Bioschemas/Schema.org biodiversity types.

*F. Michel, O. Gargominy, B. Ledentec and The Bioschemas Community.*

<https://doi.org/10.3897/biss.4.59046>



<https://bioschemas.org/>