Towards establishment of effective data support mechanism of EASIN – potential contribution of thematic international open access journals as cost-effective tools for data collection and information management

Experts’ position document
for open discussion on further strengthening EASIN as supporting tool to the IAS EU Regulation

Available online at http://www.reabic.net
Key points for open discussion:

1. “Official”/”formal” approaches to developing of operational data support mechanism (DSM) for EASIN may not work;

2. Effective DSM for EASIN should include relevant services for “informal” reporting by primary dataholders;

3. Open data publishing /thematic open access journals should be integrated into EASIN as a core component of DSM;

4. EASIN Board of Editors should play a key role in verification of information submitted to EASIN by primary dataholders via online data submission interface/service (to be developed);

5. Mechanisms for support of editorial work by EASIN Editors and for open data publishing should be elaborated.
Initial concept of EASIN, agreed among key European expert networks and database managers - 1

Implementing the European policies for alien species – networking, science, and partnership in a complex environment

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Result of a workshop organized in Ispra by JRC on 6–7 December 2012 aiming to bring together representatives of key alien species initiatives in Europe to discuss future collaboration
Implementing the European policies for alien species – networking, science, and partnership in a complex environment

Stelios Katsanevakis1, Piero Genovesi2, Samy Gaiji3, Helene Nyegaard Hvid4, Helen Roy5, Ana Luisa Nunes1, Francisco Sánchez Aguado6, Konstantins Bogucarskis1, Bos Debusscher7, Ivan Deriu1, Colin Harrower2, Trichkova1

1. “EASIN will not create new knowledge *per se*, but will instead – working in contact with all involved actors – harmonize and aggregate information made available by data providers, thereby facilitating timely access to key data on alien species and **providing valuable tools and services to scientists and policy makers.**"
Initial concept of EASIN, agreed among key European expert networks and database managers - 3

Implementing the European policies for alien species – networking, science, and partnership in a complex environment

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2. “EASIN will work in partnership with European and global data providers to facilitate access to key data and information on alien species and to demonstrate the usefulness of the existing databases. Ultimately, EASIN should facilitate further support to data collection and database maintenance and sustainability.”
3. “EASIN will promote the principles of open-source, ensure accreditation of data publishers and data owners, highlight the work of other initiatives and increase their visibility, and facilitate direct access to the original information/data.”
The proposed organizational chart of all the players in developing an EU information network for alien species (EASIN) (after Katsanevakis et al. 2013)

Players involved in the process:

1. Networks of environmental agencies and managers ("Data users")

2. Networks of national, regional, and global information systems ("Data managers")

3. Formal and informal networks of experts and citizens ("Data holders")
Current status of EASIN:

Official information support system supporting the European Regulation 1143/2014

European Regulation 1143/2014 on prevention and management of introduction and spread of Invasive Alien Species (IAS):

Article 25
Information support system

1. The Commission shall progressively establish an information support system necessary to facilitate the application of this Regulation.

2. By 2 January 2016 that system shall include a data support mechanism interconnecting existing data systems on invasive alien species....
Towards effective EASIN data support mechanism

How to develop effective data support mechanism for EASIN?

Two possible approaches:

“official” (top-down – governments-supported information systems)

and “informal” (bottom-up – initiatives by concerned scientists and citizens, to be supported by EASIN, as it was initially agreed by EASIN team and European scientific community)

Which approach is more effective?
Towards effective EASIN data support mechanism

First critical stage in delivering of IAS-related information to the level of decision-making:

Transfer of primary data from dataholders to information management system (EASIN in case of EU)

Flow chart for the early warning and rapid notification system for IAS of European concern to be implemented through EASIN in support of the new IAS Regulation (after Katsanevakis et al. 2015)
Towards effective EASIN data support mechanism

Networks of environmental agencies and managers

How to make this complex Network of Networks interconnected and function effectively?

Networks of primary data owners: scientists, citizens

Networks of IAS-related databases
Towards effective EASIN data support mechanism

Option 1: to focus on “official” mechanisms

- Networks of environmental agencies and managers
  - Can be potentially effective via EC-supported EASIN team – but only in case of primary data availability

- Networks of IAS-related databases
  - NOT effective: Project-based
  - Expensive

- Networks of primary data owners: scientists, citizens
  - NOT effective: Contract-based
  - Expensive

Information flow and services
Example of “official” approach for development of informational resources on IAS:
12-year history of HELCOM efforts to establish regional information system on IAS

May 2003 – HELCOM requested Contracting Parties to:
1. Nominate focal points on aquatic bioinvasions to provide up-to-date information on invasive aquatic species in the areas of their jurisdiction;
2. Provide access to the HELCOM environmental monitoring data on non-native species for timely incorporation of information into open informational resources (GIS “Invasive Species of the Baltic Sea” – RBIC(former name of REABIC)-based!)

Results:
1. During 2003-2004 HELCOM Contracting Parties nominated scientists from governmental institutions as National Focal Points on aquatic bioinvasions for the Baltic Sea area;
2. National Focal Points provided first data to GIS “Invasive Species of the Baltic Sea” in 2006 only in format of research articles – after establishment of the first REABIC journal – Aquatic Invasions, which was developed specifically for protection of authors rights on primary species record data.

Conclusion:
Scientists are not interested to share their unpublished data with open information systems, but they are highly interested in good publication services!
Example of “official” approach for development of informational resources on IAS: 12-year history of HELCOM efforts to establish regional information system on IAS.

Result of HELCOM efforts during 2012-2015 under three formal HELCOM projects (HELCOM ALIENS 2, ALIENS 3 and BALSAM): sophisticated online IAS decision support tool.

Risk Assessment Tool under the HELCOM/OSPAR Harmonised Procedure on Exemptions under the Ballast Water Management Convention.

BUT: this sophisticated and expensive “official” tool is not operational – data support mechanism is missing, or not working!

Data on IAS records in port areas are not available!

Towards effective EASIN data support mechanism

Option 2: to develop “informal” mechanisms

Networks of environmental agencies and managers

Networks of IAS-related databases

Networks of primary data owners: scientists, citizens
Towards effective EASIN data support mechanism

Networks of environmental agencies and managers

Information flow and services

Open Access journals

Networks of IAS-related databases

Cost-effective: some resources are needed for transfer of published data to the database

Networks of primary data owners: scientists, citizens

Highly effective: experts can provide recommendations for management of IAS, and managers can report on best management practices in applied papers

Highly effective: experts always interested in journal publications and even ready to pay for open access to their papers – but some of them may need support for data publication
Data publishing services of open access journals: contribution to EASIN-lit with geo-referenced IAS record data, top 15 journals (2015)

Open Access journals

Aquatic Invasions: 39
Mediterranean Marine Science: 21
Biological Invasions: 14
Marine Biodiversity Records: 11
Hydrobiologia: 9
Scientia Marina: 8
Comm. Int. l’Expl. Sciede la Mer Méd: 6
J. Black Sea/Med.Env.: 6
European Journal of Wildlife Research: 6
Journal of Zoology: 6
BioInvasions Records: 5
Cahiers de Biologie Marine: 5
J. of Plankton Research: 5
Marine Biology: 5
Mammal Review: 5

Number of references to data sources
Services of three thematic open access REABIC journals for scientists, database managers and environmental managers: established as a bottom-up initiative of concerned scientists for support of open informational resources on IAS in Europe (with start-up funding from European Commission FP6 and FP7 projects ALARM and EnviroGRIDS)

http://www.reabic.net/journals/

Number of published papers (per year)

- Management of Biological Invasions
- BioInvasions Records
- Aquatic Invasions

Support from ALARM project

EnviroGRIDS
Table S1. Inventory of marine alien and crypogenic species in Dodecanese Islands (March 2015).

<table>
<thead>
<tr>
<th>Species</th>
<th>Origin</th>
<th>Introduction pathway</th>
<th>Establishment success</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cyanobacteria</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trichodesmium erythraeum Ehrenberg ex Gomont, 1893</td>
<td>Indo-Pacific/Red Sea</td>
<td>Unknown</td>
<td>Alien?/Unknown</td>
</tr>
<tr>
<td>Prymnesiophyceae</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phaeocystis pouchetii (Hariot) Lagerheim, 1896</td>
<td>Cosmopolitan</td>
<td>Shipping?</td>
<td>Cryptogenic/Established</td>
</tr>
<tr>
<td>Bacillariophyceae</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proboscia indica (Peragallo) Hernández-Becerril, 1995</td>
<td>Indo-Pacific</td>
<td>Suez/spreading</td>
<td>Cryptogenic/Unknown</td>
</tr>
<tr>
<td>Uvophyceae</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caulerpa cylindracea Sonder</td>
<td>Indo West Pacific</td>
<td>Aquarium trade</td>
<td>Alien/invasive</td>
</tr>
<tr>
<td>Caulerpa distichophylla Sonder</td>
<td>South Pacific</td>
<td>Aquarium trade</td>
<td>Alien/Established</td>
</tr>
<tr>
<td>Caulerpa racemosa var. lamourotixii f. requienii (Montagne) Weber-van Bosse</td>
<td>Indo West Pacific</td>
<td>Suez/spreading</td>
<td>Alien/Established</td>
</tr>
</tbody>
</table>
Impacts of invasive alien marine species on ecosystem services and biodiversity: a pan-European review

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Pathways and gateways of freshwater invasions in Europe

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Open Access journals services for support of expert networks: publication of collaborative research – *Mediterranean Marine Science Collective articles*

**New Mediterranean Biodiversity Records (October 2015)**

F. CROCETTA¹, D. AGIUS², P. BALISTRERI³, M. BARICHE⁴, Y.K. BAYHAN⁵, M. ÇAKIR⁶, S. CIRIACO⁷, M. CORSINI-FOKA⁸, A. DEIDUN⁹, R. EL ZRELLI¹⁰, D. ERGÜDEN¹¹, J. EVANS¹², M. GHELIA¹³, M. GIAVASI¹⁴, P. KLEITOU¹⁵, D. POUSAS²

**New Mediterranean Biodiversity Records (April 2015)**

A. ZENETOS¹, E.H. KH. AKEL², C. APOSTOLIDIS³, M. BILECENOGLU⁴, G. BITAR⁵, V. BUCHET⁵, N. CHALARI⁶, M. GLOIO², A. ITOU¹, L. LI¹, W. REN¹

**New Mediterranean Biodiversity Records (July 2015)**

Open Access journals services for delivering scientific advice for IAS-related policies and management:

**Viewpoint papers - 1**

doi: [http://dx.doi.org/10.3391/mbi.2014.5.1.01](http://dx.doi.org/10.3391/mbi.2014.5.1.01)
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**Tackling Invasive Alien Species in Europe: the Top 20 Issues**


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doi: [http://dx.doi.org/10.3391/mbi.2014.5.2.01](http://dx.doi.org/10.3391/mbi.2014.5.2.01)
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**Identifying the top issues of marine invasive alien species in Europe**

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Implementing the European policies for alien species – networking, science, and partnership in a complex environment

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The importance of open data for invasive alien species research, policy and management

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Twenty five years of invasion: management of the round goby *Neogobius melanostomus* in the Baltic Sea

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Open Access journals services for database managers and information management and exchange networks: Information Management papers

Building the European Alien Species Information Network (EASIN): a novel approach for the exploration of distributed alien species data

European Alien Species Information Network (EASIN): supporting European policies and scientific research
Updated review of marine alien species and other ‘newcomers’ recorded from the Maltese Islands (Central Mediterranean)

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Handling Editor: Argyro Zenetos

Received: 17 September 2014; Accepted: 19 January 2015; Published on line: 4 March 2015
Services of REABIC journals for support of expert networks:
European Information and Research Network on Aquatic Invasive Species (ERNAIS) – informal “Network of Networks”

Editors of REABIC journals
contributing authors (2015)
Services of open access journals for support of expert networks: *Mediterranean Marine Science experts*
Publishing services of REABIC:
Support of developing European early warning system on IAS

Selected records of IAS, published in REABIC journals in 2015

First record for Europe
First record for country
New record for country
Early warning services of open access journals:
Support of developing European early warning system on IAS

Selected records of IAS, published in Mediterranean Marine Science in 2015
Flow chart for the early warning and rapid notification system for IAS of European concern to be implemented through EASIN in support of the new IAS Regulation (after Katsanevakis et al. 2015)
Effective data support mechanism for EASIN should include technical tools and services for “informal” reporting by dataholders:

1. **User-friendly interface** for uploading geo-referenced species record information (incl. photographs, and/or other information with data description/analysis);

2. **Online GIS application** for verification of geo-referenced data by dataholders with opportunity to generate print-quality species distribution maps;

3. **Data quality control mechanism** – verification of species identification and evaluation of other submitted information by reviewers (EASIN Editors?);

4. **Data publication service** with opportunity to generate data papers in standard format for rapid publication in open access journals, associated with EASIN
Main problems for data publishing and possible solutions

1. Funds for open access publishing are still limited or even not available for many scientists (dataholders) in Europe

**Possible solutions:** In the long-term, this issue can be resolved after implementation of developing EU policy on Open Access publishing (New policy Initiative: The Establishment of an Open Science Policy Platform [http://ec.europa.eu/research/swafs/index.cfm?pg=policy&lib=science](http://ec.europa.eu/research/swafs/index.cfm?pg=policy&lib=science)). In short-term, establishment of targeted public fund to cover data paper publishing cost could be helpful. Also, open access publishers should consider opportunities of private foundations.

2. Scientists are more interested in publication of their research in journals with high impact factors. Most of these journals are not open access (or open access option is very expensive for authors), and not requesting authors to publish primary species record data.

**Possible solutions:** open access publishers should provide better publication services in terms of editorial process and availability for authors of user-friendly technical tools for their data presentation and management (incl. mapping tools). In this regard integration of open access publishing in EASIN information system could be very useful.
Conclusions

1. “Official” approaches to development of data support mechanisms for open information systems on IAS may not work - scientists (primary dataholders) are not interested to share their unpublished data, but they are highly interested in good publication services!

2. Thematic open access journals, as informal bottom-up initiatives by concerned scientists, can serve as cost-effective instruments for data collection and information management, and provide platform for linking IAS-related networks of scientists, database and environmental managers (supporting Network of Networks).

3. The incorporation of thematic open access journals into any IAS-related information system represents an innovative cost-effective approach to IAS-related information management and may contribute to sustainability and cost-effectiveness of operational information resources on IAS.

4. Effective data support mechanism for decision support tool on IAS should include user-friendly online software for data submission, data management, data presentation, and data publication services for primary dataholders - scientists and citizens.