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**6th ESENIASTOOLS Workshop: East and South European Network for Invasive Alien Species  
– A tool to support the management of alien species in Bulgaria (ESENIASTOOLS)**

**ESENIASTOOLS Kick-Off Meeting  
26-28 October 2015, Sofia, Bulgaria**

**ESENIASTOOLS WG5 Meeting: Data collection, analysis, standardisation and  
harmonisation on alien terrestrial invertebrate species**

**29-30 October 2015, Sofia, Bulgaria**

**ORGANISED BY:**

Institute of Biodiversity and Ecosystem Research,  
Bulgarian Academy of Sciences (IBER-BAS)  
East and South European Network for Invasive Alien Species (ESENIASTOOLS)

**ORGANISING COMMITTEE:**

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**SUPPORTED BY:**

Financial Mechanism of the European Economic Area 2009-2014  
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Project: East and South European Network for Invasive Alien Species –  
A tool to support the management of alien species in Bulgaria  
ESENIASTOOLS, Д-33-51/30.06.2015

## MEETING REPORT

### Background

Invasive alien species (IAS) threaten biodiversity and ecosystem services, and have adverse socio-economic impact. Their introductions and spread have increased due to human activities and global change. As a response to this threat, a new EU Regulation 1143/2014 on IAS was adopted and in force from 1<sup>st</sup> January 2015. The European Alien Species Information Network (EASIN) was developed to facilitate the exploration of existing IAS information. Networking on IAS in different scales is needed to collect data, prevent new introductions and manage already widely spread invasive alien species. The East and South European Network for Invasive Alien Species (ESENias) was established in 2011 to facilitate solving IAS issues at regional level. One of the main activities of ESENias has been the organisation of yearly workshops (Zagreb 2010, Sofia 2011, Belgrade 2012, Çanakkale 2013, and Antalya 2014) aimed at promoting capacity building initiatives and increasing knowledge on IAS within all countries in the region. A new project has been launched: East and South European Network for Invasive Alien Species – A tool to support the management of alien species in Bulgaria (ESENias-TOOLS). The project is funded by the Financial Mechanism of the European Economic Area 2009-2014, under the Programme BG03 Biodiversity and Ecosystem Services, and aims at networking and development of IAS tools within the framework of ESENias to support the management of alien species in Bulgaria and in the overall region. The project promoter is the Institute of Biodiversity and Ecosystem Services with the Bulgarian Academy of Sciences and project partners include 10 state and research institutions from Bulgaria, Greece, Croatia, Serbia, Romania, Turkey, Iceland and R. Macedonia.

### Aims of the meeting

- Discuss ESENias-TOOLS project working plan, tasks and activities;
- Discuss and approve common data forms, templates, questionnaires, protocols and methods;
- Plan future work and organisation of this work within the working groups with the participation of experts from all ESENias countries;
- Present the ESENias-TOOLS project and preliminary results at an Open Information Day
- Share information on IAS related initiatives carried out at regional level, such as national and local monitoring schemes, risk assessments, control and eradication projects, management plans and national strategies, citizens activities and responsibilities;
- Seek further opportunities for cooperation and networking on IAS in the region and collaboration with other networks and projects, such as EASIN.

### Organisation

The workshop was organised by the Institute of Biodiversity and Ecosystem Research with the Bulgarian Academy of Sciences (IBER-BAS) and ESENias. It was supported by the Financial Mechanism of the European Economic Area 2009–2014, Programme ‘BG03. Biodiversity and Ecosystem Services’, under the ESENias-TOOLS project. The workshop was attended by more than 80 participants, including project participants, representatives of research institutions, universities, environmental protection agencies, ministries, as well as NGOs from 12 countries (Bulgaria, Croatia, Iceland, Italy, Greece, Kosovo, Montenegro, R. Macedonia, Romania, Serbia, Turkey, and UK).

The workshop started on the 26th October 2015 with welcome of participants and ESENIAS-TOOLS project update by the project coordinator T. Trichkova. The project goals, tasks, partners, working plan, activities and progress were presented. Programme and project requirements about progress and financial reporting, such as responsibilities, data flow, forms, financial documents, financial audit, deadlines, etc., were presented by T. Trichkova and V. Vladimirov.

During the following sessions the project activities were presented and discussed per working groups (WGs). During the sessions on 26<sup>th</sup> October 2015, the task leaders of WGs 1, 7, 8, 9 and 10 presented the working plans and led the discussions. On the 28<sup>th</sup> October 2015, there was one hour for discussions within each working group and case study group and after that the task leaders of WGs 2, 3, 4, 5 and 6 and case study leaders presented their work and results to other participants.

During the workshop an information day ‘ESENIAS-TOOLS Open Day’ was organised on the 27<sup>th</sup> October 2015, with the aims to present the ESENIAS-TOOLS project and preliminary results, to share information on IAS related initiatives carried out at regional level, and to seek further opportunities for cooperation and networking on IAS in the ESENIAS region. The talks on the case studies from the region continued in the morning of 28<sup>th</sup> October 2015.

## **Results**

The following **topics** were proposed for discussion in the WGs:

- List of alien species for the ESENIAS region
- Methodology and criteria for prioritisation – individual approach for each group?
- List of priority species for the region – for which we will collect data in the field and prepare fact sheets and maps
- List of experts/ authors of the fact sheets
- Template for the fact sheets – common for all groups and/or specific?
- Common protocols for collecting data in the field/ sampling protocols
- Common protocols for collecting data from literature sources, project reports, other databases, collections, etc.
- Species data form
- Book chapter

The following results were achieved:

### **General results and conclusions:**

- ESENIAS lists of alien species, priority species and alert lists will be prepared within the ESENIAS-TOOLS project
- Data for the ESENIAS database will be collected from ESENIAS-TOOLS project partners, ESENIAS countries, as well as from neighbour countries/ regions, in particular in freshwater and marine alien species groups
- Data collection and validation will be based on all available data - literature review, national, regional and EU databases, as well as field survey
- The ESENIAS database will be developed in compatibility with the European Alien Species Information Network (EASIN)

- The ESENIAS database will follow the generally agreed global definitions and standards related to invasive alien species, such as the CBD and IUCN classification schemes, and will comply with EU legislation, such as the EU Regulation 1143/2014 on IAS and INSPIRE Directive 2007/2/EC
- Common methodology for collection and validation of data will be used within each species group among all experts and countries
- Individual approaches for prioritisation will be apply in different species groups: marine, freshwater, plants and fungi, invertebrates and vertebrates
- Fact-sheets on priority species for the ESENIAS region will be prepared jointly and published in the 2<sup>nd</sup> ESENIAS book and ESENIAS website
- ESENIAS will continue and extend the cooperation and networking on IAS in the region and search further opportunities for collaboration with other networks and projects, such as EASIN, DIAS and others.



## Specific results and conclusions in the Working groups (WGs)

### WG1: Database development and organisation (Teodora Trichkova)

The WG1 meeting was represented by Teodora Trichkova - leader of the WG1, Stelios Katsanevakis – responsible for database compatibility with EASIN, Lubomir Filipov – GIS expert, Antony Sharkov and Dimitar Vasilev – database experts.

Objectives of the WG1 session:

- To discuss database structure - the draft data forms/ templates for collection of data on alien species, and IAS experts, institutions, projects and publications from the ESENIAS region
- To discuss definitions and standards, which will be used
- To discuss sharing of data within ESENAS and with other networks
- To discuss quality assurance on data.

Teodora Trichkova presented the tasks and specific milestones of the WG1, as follows:

Task 1.1: Preparation of a handbook for database use, a user's guide for data collection, analysis, dissemination and further outreach

Task 1.2: Preparation of data forms, design and structuring of the database Task 1.3: Construction of the database and data entry

Task 1.4: Database compatibility with the Bulgarian Biodiversity Information System

Task 1.5: Database compatibility with the European Commission's European Alien Species Information Network (EASIN)

Task 1.6: Creation of the GIS database and mapping of priority species

Specific milestones:

T 1.1: Handbook for database use;

T 1.2: Data forms, structured database;

T 1.3: Database constructed and data entered;

T 1.4: Database compatible with IBBIS;

T 1.5: Database compatible with EASIN;

T 1.6: GIS database and maps of priority species.

T. Trichkova reported on the progress in the WG1, and presented the following topics for discussion:

- Data structure – data forms
- Terminology
- Data format
- Data sharing
  - within ESENIAS
  - with EASIN
- Quality assurance on data

D. Vasilev presented the database development status – methodology, design, structure, functionalities, quality assurance and updating, as well as the user account system.

L. Filipov talked about the development of the GIS platform – key functionalities and key principles of the system.

Some of the issues as data forms/ templates, definitions and standards, data flow within ESENIAS, and communication with other networks were discussed with all participants at the meeting. Technical issues as database management, data entry, user access, update, and data sharing with EASIN were discussed in a smaller group among responsible experts.

The following decisions were made:

- The proposed data forms/ templates (species, institution, expert, project, and publication data form) were approved in general. Some corrections and revision were suggested, according to the new terminology and standards accepted
- The ESENIAS database will follow the generally agreed global definitions and standards related to invasive alien species, such as the CBD and IUCN classification schemes, and will comply with EU legislation, such as the EU Regulation 1143/2014 on IAS and INSPIRE Directive 2007/2/EC
- Data will be submitted by countries and validated by the ESENIAS expert group
- The ESENIAS database will be developed in compatibility with the European Alien Species Information Network (EASIN)



## **WG2: Data collection, analysis, standardisation and harmonisation on alien marine species (Argyro Zenetos, Fabio Crocetta and Paraskevi Karachle)**

The WG2 meeting was attended by Dr. Argyro Zenetos (Greece WG2 group - chairperson), Dr. Fabio Crocetta (Greece WG2 group - attendant), Dr. Katja Jelic (Croatia WG2 group - attendant), Dr. Stelios Katsanevakis (Greece WG2 group - external expert) and Dr. Daniyar Memedemin (Romania) on behalf of Prof. Marius Skolka.

The following 5 issues were discussed during the marine group meeting:

- preliminary homogenisation and validation of data collection;
- single country deliverables and reports within alien species lists;
- single country deliverables within local experts lists;
- homogenisation and rationale for inclusion of alien species in priority lists, and factsheets for 10 selected species;
- authorships and topics covered by ESENIAS-TOOLS book chapters.

### **Preliminary homogenisation and validation of data collection**

As agreed by all participants, WG2 country leader (A. Zenetos - Greece) will soon provide guidelines and rationale for inclusion of alien species in the ESENIAS area. A new classification of vectors will be also provided, according to the new CBD classification. Preliminary country lists will be soon sent to each WG2 recognised partner.

### **Single country deliverables and reports within alien species lists**

Following the receipt of guidelines, each country will check and validate preliminary lists. A double check of data shown in the lists provided by single country will be conducted by the WG2 leader. At this stage, pdfs regarding data shown in the list (first record date, establishment success, etc.) may be necessary, and therefore a reference collection of pdfs from single countries would be appreciated.

When WG2 partners are lacking for countries (e.g. Italy, Slovenia, Montenegro and Cyprus), country reports will be filled by WG2 leader and subsequently sent to selected country experts for careful revision. WG2 leader suggested to include local experts as co-authors of subsequent articles from ESENIAS-TOOLS data.

Data validation by single countries should come not later than the end of November, and should be addressed to the attention of Argyro Zenetos (zenetos@hcmr.gr) and Fabio Crocetta (fabiocrocetta@alice.it - fabiocrocetta@hcmr.gr).

### **Single country deliverables within local experts lists**

List of experts, following the template provided by the ESENIAS-TOOLS leader (Teodora Trichkova - Bulgaria), will be provided by the 15<sup>th</sup> of November to the attention of Argyro Zenetos (zenetos@hcmr.gr) and Paraskevi Karachle (pkarachle@hcmr.gr).

### **Homogenisation and rationale for inclusion of alien species in priority lists, and factsheets for 10 selected species**

A preliminary list of priority species has been already provided by the WG2 leader (Greece), and subsequently discussed by the participants to the WG2 meeting in Athens (12-13 October 2015). WG2 leader experts (A. Zenetos, S. Katsanevakis and F. Crocetta) will provide guidelines and rationale for inclusions of alien species in priority lists, and the subsequent list will be then checked and discussed by all the WG2 members.

According to a common strategy, factsheets will be provided for ten species per WG. Template for factsheets will be provided by WG2 experts. The ten selected species (if

confirmed in the definitive list) will be covering as much as possible different taxonomic groups and should be species not usually included in previous factsheets by other projects. The following preliminary list of taxa has been established, and deliverables per country has been assigned as follow:

<b>Taxonomic group</b>	<b>Species</b>	<b>Country/Expert</b>
POLYCHAETA	<i>Streblospio gynobranchiata</i> Rice & Levin, 1998	Romania
COPEPODA	<i>Oithona brevicornis</i> Giesbrecht, 1891	Bulgaria
<b>Yet-to-be-decided phytoplanktonic species</b>		Bulgaria
FISH	<i>Pterois miles</i> (Bennett, 1828)	Greece/Zenetos
ECHINOIDEA	<i>Diadema setosum</i> (Leske, 1778)	Greece/Zenetos
<b>Yet-to-be-decided mollusk species</b>		Greece/Crocetta
DECAPODA	<i>Penaeus aztecus</i> Ives, 1891	Greece/Zenetos
TUNICATA	<i>Microcosmus exasperatus</i> Heller, 1878	Greece/Crocetta
SCYPHOZOA	<i>Cassiopea andromeda</i> (Forsskål, 1775)	Turkey
<b>Yet-to-be-decided algae species</b>		Turkey

Guidelines and rationale for inclusions of alien species in priority lists, as well as species factsheets, will be then included in one of the chapter of the ESENIAS-TOOLS book (see below).

#### **Authorships and topics covered by ESENIAS-TOOLS book chapters**

According to the ESENIAS-TOOLS leader (Teodora Trichkova - Bulgaria) instructions, 4 chapters will cover WG2 work. We decided to divide them as follows, assigning an *a priori* authorships of the leader/leaders, who may then decide to invite other experts or WG2 participants to co-author the chapter/s:

- trends in introduction in ESENIAS countries (by WG2 Greece);
- trends in pathways of introduction (by WG2 Greece);
- impacts (by WG2 Croatia) and protocols for risk assessments (Katsanevakis)
- priority species (by WG2 Bulgaria and Romania, and including as authors WG2 leader experts (A. Zenetos, S. Katsanevakis and F. Crocetta) who will provide guidelines and rationale for inclusions of alien species in priority lists, as well as all the authors of the factsheets.



### **WG3: Data collection, analysis, standardisation and harmonisation on alien freshwater species (Aljoša Duplić)**

The WG3 meeting was attended by Aljoša Duplić, leader of the WG3, and representatives of ESENIAS-TOOLS participants from R. Macedonia and Bulgaria.

Notes of the WG3 are as follows:

- Data for the WG3 will be collected from ESENIAS-TOOLS project partners as well as from neighbor countries Italy and Slovenia as most of the rivers are trans-boundary freshwater ecosystems.
- Participants from HIO, R. Macedonia, will prepare lists of already known and recorded aquatic alien species based on literature, results of previous research and results of Case study 3.
- Data collection and validation will be based on all available data - literature review and field survey.
- Date for WG3 meeting in Zagreb was set up (25th-27th November 2015) and topics for discussion during the meeting were added (species data forms, risk assessments, GIS maps for priority species, fact sheets, networking).
- Specific milestones of WG3 have been agreed: 1. Standardised and harmonised methods on all alien freshwater species; 2. Data collected and validated for all alien freshwater species; 3. List of alien freshwater species; 4. List of prioritised freshwater species for all groups and 5. Fact sheets for priority freshwater species.

### **Case study 3 (Sasho Trajanovski)**

The representatives of the Hydrobiological Institute Ohrid (Partner 10) – leader of Case study 3 - informed that the field work and research activities will start in the beginning of 2016. It was decided that the work will focus mainly on the largest tributary of Lake Ohrid – the Sateska River and the only outflow of the lake – the Crn Drim River, as well as the adjacent lake littoral parts. Minimum of five sites per river will be selected for sampling. The sampling will be organised together with the Bulgarian partner (IBEI-BAS) in the spring-summer period of 2016 and will cover the following components: benthic diatoms, macrophytes, benthic macroinvertebrates and fish.

Sasho Trajanovski also gave information about the forthcoming Case study 3 Kick-off meeting, which was planned to be held in December 2016 in Ohrid. During this meeting all details about the sampling sites, methods, participants, etc., will be defined and reported.



#### **WG4: Data collection, analysis, standardisation and harmonisation on alien plant and fungi species (Milica Rat)**

The WG4 meeting was attended by the following participants: Vladimir Vladimirov, Anna Ganeva, Ahmet Uludag, Necmi Aksoy, Paulina Anastasiu, Richard Lansdown, Bojan Simovski, Sead Hadžiablahović, Igor Boršić, and Milica Rat.

The following topics were discussed: 1) list of alien plants and fungi; 2) concept of definitions (alien status and invasiveness status); and 3) method for prioritisation of species. At the end of discussion a working plan for ESENIAS book, and preparation of the factsheets for priority species was proposed.

##### ***1) List of alien plants and fungi***

a) **The list of alien plant species** has more than 900 species. Comparing this number with number of alien plants per country, it is notable disproportion. In some countries, like Bosnia and Hercegovina only cc. 80 species is recorded in published literature. On the other, in Romania nearly 500 species is recorded. In some lists neophytes and archaeophytes are included, so as cultivated species that occasionally escape out of gardens and agricultural fields, without creating reproductive populations (i.e. *Zea mays*, *Helianthus annuus* etc.).

At the discussion was emphasis that this is result of non harmonized approach for creation of national list. To overcome this, it was proposed to create a unique system for list creation, which will be realized during ESENIAS-TOOLS project. Starting point for this activity will be already published list for ESENIAS region. Suggestion is to send it to all national ESENIAS focal points, but as well partners' experts created list of species, and according to it to create national list. From these national lists, then again new critically revised list of alien plant species in ESENIAS region will be published. One of the reasons for this method of work, highlighted during the discussion, is that ESENIAS region, east and central Mediterranean and Balkan Peninsula is "donors region" for alien in other parts of Europe. Because of that is dangerous to take over data without revisions.

In some other projects and regions, freshwater, marine and terrestrial plants are separated. In this list, all species will be listed together, with emphasis to which of the three groups belong. Reasons of group merging lies in the fact that there is not so many experts that investigate specific groups, i.t. a small number of research groups is focused only on invasive and alien plants species. Mostly, research deal in the same time with more topics, i.e. they do have data about freshwater as well terrestrial plants. Because of that it is hard, on ESENIAS regional level to have separate groups. In addition, creation of provisional lists also emphasized that for some plant species groups there is no valide data at hole region level.

Mosses are out group among alien plants. By now in ESENIAS region no data about alien mosses are published. But, according to source in Europe, there is several taxa that might be aliens. To solve this problem, it was discussed to organized team for mosses. They will analyze published literature on this topic, and harmonize it with data for ESENIAS region. As well, there is proposal to get some filed research during ESENIAS-tools project.

##### **b) List of alien fungi species**

In the publications of the first ESENIAS book, only for Serbia are given data about alien fungi. For the first preliminary list of alien species, data were taken from other databases, since there is no literature data. Comparing to other, primarily west European countries, in ESENIAS region is recorded by now only small percent of alien fungi. There is no evidence about experts that work solely on this issue. During ESENIAS-tools meeting the information about experts that deal with any aspects of alien fungi was spread. The aim is to

collect any published data. This was adopted during discussion. The final conclusion was to contact some of the experts to participate in list creation. All other topics, related to alien fungi (alien and invasiveness status, and methods for prioritization will be discussed after creation of experts group).

## **2) *Concept of definitions (alien status and invasiveness status)***

Nowadays, different propositions for definition of alien as well as invasiveness status are published frequently. During 3-days meeting, it was discussed how to harmonize these definitions for all organisms, but with concert that each group have some special issue.

In Europe, there is general concept that alien plant species are grouped firstly as archaeophytes (introduced before 1492) and neophytes (introduced after 1492). This terminology is associated with discovery of new world continents, and early increase in the intensity of trade and exchanges between distant regions. Archaeophytes should be on the list of aliens, but when these lists are considered for creation the list of invasive etc. they are mostly excluded. This concept is proposed for ESENIAS region too.

Proposed concept for alien status is: established (include naturalized), casual, cryptogenic or unknown species status.

For invasiveness status, clear concept was not defined. There is general concept that invasiveness should cover impact on biodiversity, human health and economic aspect. Nevertheless, detail approach will be define during WG meeting.

## **3) *Method(s) for prioritization of species***

Prioritization of the alien species is the specific task, that was mostly commented during 3-days meeting in Sofia. From the starting point of the ESENIAS-TOOLS project, aim is to clarify methods for prioritization of species. Problem is which concept to apply in which group. It was taken as a main conclusion, that each WG should develop independent methodology.

During discussion the main direction for the methodology was accepted. It is necessary to prioritization include species that are invasive and potentially invasive. Generally was concluded that alien species that are naturalized, but without evident impact on environment should be excluded. Proposed methodology is to analyse species per species, for each country. Important is to define status for each species on national level. It was emphasized that species with negative impact in one country should be commented for other countries as well. For example, some of the so called Mediterranean species are now recorded in the continental part, with stable and reproductive populations. This species, even not reported in every country, should be on the list.

Second, important issue is impact on human health. There is several species with limited range or without obvious impact on biodiversity. Nevertheless, their impact on human health is significant. Those species should always be included on the priority list.

Third, but not less important is impact on economy. When we spoke about plants, there are many species, earlier recognized as weeds that have big impact on cultivated species, thus adversely affecting the yield. Usually, those species are not recorded out of artificial habitats, but due to their impact on agriculture should not be neglected.

Second book of ESENIAS, parts that include data collected and analysed on the WG for plant and fungi, according to previously written and discussed should include: data about priority species, with factsheets for each of them. For those species, not published in the book, factsheets will be published otherwise. For each factsheet will be determined by one

main/corresponding author. From every ESENIAS country involved will be national experts that will collect and provide data about species. In addition to factsheet, proposed is to publish revised list of alien plant species, freshwater plants species. As well it was commented to create and publish ESENIAS regional list of alien fungi and mosses. All this topic remain open for discussion and changes that will be adopted during WG meeting that will be held in Novi Sad (Sremski Karlovci, Serbia).



**WG5: Data collection, analysis, standardisation and harmonisation on alien terrestrial invertebrate species (Rumen Tomov)**

The WG5 meeting continued on 29-30 October and a common separate WG5 meeting report was prepared.



## **WG6: Data collection, analysis, standardisation and harmonisation on alien terrestrial vertebrate species (Dan Cogalniceanu)**

The WG6 meeting was attended by WG6 leader Dan Cogalniceanu (Romania), Boris Nikolov, Nikolay Tzankov, Yordan Koshev (Bulgaria), and Sonja Desnica (Croatia).

During the brief meeting several important aspects regarding the organisation of the WG6 meeting in Constanța, Romania were discussed, and following topics were covered:

1. Criteria for including species (status)
  - Should we consider species introduced long ago?
  - Should we consider isolated reports?
  - Should we consider molecular reports?
2. Time and spatial coverage
  - Literature survey – What time period should be covered? Starting in 1990, 2000, ....
  - Spatial coverage – Who will cover Bosnia, Albania, Kosovo, Montenegro?
3. Data sources, QA/QC
  - Extracting data from existing databases:
    - compile a list of existing databases
  - Literature review
    - Agree on the structure of the database
  - Criteria for QA/QC – filtering the data
4. Workshop WG6 in Constanta – organisational details.



## **WG7: IAS research, management and legislation review (Rumen Tomov, Vladimir Vladimirov)**

### **Objectives of the WG7 meeting:**

- To establish a list of collaborators who will be involved in the tasks of WG7
- To discuss the methodology for collection of data for development of expert, institution, research projects and publication registers
- To approve the questionnaire developed for assessing regulative framework related to alien species
- To establish a road map for 2016 (Time table, reporting, dissemination of results)

Rumen Tomov made an overview of the tasks and expected results of the WG7, as follows:

Task 7.1: Preparation of IAS expert register

Task 7.2: Preparation of IAS responsible institution register

Task 7.3: Review of IAS research activities and preparation of lists of projects and publications

Task 7.4: Analysis of management practices (based on review of guides, best practices, action plans, risk assessment and management protocols and plans)

Task 7.5: IAS legislation and guidance

Expected results:

- Register of ESEIAS expert register;
- Register of IAS responsible institutions;
- List of research projects and publications;
- Report on IAS management practices;
- List of IAS legislation and guidance documents;

The following results were summarised after the discussions at the meeting:

- Responsible WG7 country experts from the ESENIAS region were proposed as responsible persons to collect the necessary data for the registers (Table 1).

**Table 1.** Experts included in the team of WG7

<b>Country</b>	<b>Expert</b>
Bulgaria	Teodora Trichkova
Bulgaria	Vladimir Vladimirov
Bulgaria	Rumen Tomov
Greece	Argyro Zenetos
Iceland	David Christian Finger
Albania	Sajmir Beqiraj
Romania	Dan Cogalniceanu
Serbia	Milica Rat
Croatia	Aljosa Duplic
Italy	Giuseppe Brundu

Macedonia	Sasho Trajanovski
Turkey	Ahmet Uludag
Montenegro	Ivana Bulatović
Kosovo	Qenan Maxhuni
Bosnia and Herzegovina	Goran Krstovic

- The proposed draft version of *Questionnaire for assessing regulative framework related to alien species* was approved in general. It was noted that some parts need to be clarified, re-formulated and/or updated. It was also commented that the set of questions need different kind of expertise and that the questionnaire should be filled by several experts affiliated to different institutions. Some participants mentioned that sometimes it is difficult to get answer from the official institutions and it should be decided to whom and how to send the questionnaire in order to get a quick answer. No additional questions were added. It was agreed to distribute the questionnaire to country representatives (Table 1), who will be responsible for collation of answers from different stakeholders and send back the filled questionnaires to the WG7 leader.

## **WG8: Capacity building (Rumen Tomov)**

### **Objective of the WG8 session:**

- To present the WG8 tasks and expected results
- To present planned Case studies in the framework of the project

Rumen Tomov presented the tasks and expected results of the WG8, as follows:

Task 8.1: Organisation of training courses for stakeholders (governmental agencies, regional laboratories, national and natural parks) (Partner 1, Radoslav Stanchev)

Task 8.2: Study visits

Task 8.3: Short visits

Expected results:

- Training courses for stakeholders conducted
- Study visits conducted
- Short visits conducted

The Methodology for implementing of the WG8 tasks was discussed:

- Exchange visits for the implementation of ESENIAS-TOOLS case studies
- Short visits to leading research institutions, EU bodies and international organisations dealing with IAS
- Visits and meetings with partners from donor countries with the aim of sharing experience and know-how.

## **WG9: Awareness raising (Rumen Tomov)**

Objectives of the WG9 session:

- To define the approach for developing an early warning tool
- To approve the template for IAS information materials

Rumen Tomov presented the tasks and expected results of the WG9, as follows:

Task 9.1: Website maintenance (Project promoter)

Task 9.2: Development of early warning tool (Project promoter)

Task 9.3: Preparation of IAS exhibition (Partner 2: NMNH-BAS)

Task 9.4: Communication with stakeholders (Partner 2: NMNH-BAS)

Expected results:

- Website updated and functioning;
- IAS early warning tool developed;
- Permanent IAS exhibition at the NMNH-BAS;
- IAS information materials/alerts prepared and meeting with stakeholders conducted.

A short review of available early warning tools was made. Different approaches of early warning systems and tools were discussed. It was agreed that for the purposes of ESENIAS-TOOLS, a common alert list for the ESENIAS region will be created. Common regional standards will be defined and the working groups will apply individual approaches to create the list. They should be compatible with the EU IAS regulation and the horizon scanning approach used and recommended at Pan-European level. Furthermore, dataflow and publication of species alerts on the ESENIAS webpage were discussed.

## **WG10: Networking and dissemination of project results (Ahmet Uludag)**

Objectives of the WG10 session:

- To review project WG10 activities
- To discuss the preparation of fact-sheets and review chapters for the book
- To plan the networking meeting in December in Istanbul

Ahmet Uludag presented the tasks and specific milestones in the WG10, as follows:

Task 10.1: Networking within ESENIAS

Task 10.2: Collaboration with EASIN, NOBANIS, DIAS, and other networks

Task 10.3: Joint publication

Task 10.4: Presentation of results at conferences and/or publication of information materials

Specific milestones:

- T 10.1: Two ESENIAS meetings organised;
- T 10.2: Joint meetings with other networks, such as EASIN, NOBANIS, and DIAS;
- T 10.3: Joint publication prepared;
- T 10.4: Information materials and results presented at conferences.

Furthermore, project activities as participation in scientific forums and preparation of publications were presented.

The main part of the discussions focused on the ESENIAS publication – contributors, content, target groups. The following was agreed upon:

The book will have the following content/ chapters:

- ESENIAS Book introduction
- ESENIAS-TOOLS project
- IAS Regulation chapter
- Marine chapter
- Freshwater chapter
- Plants and fungi chapter
- Terrestrial invertebrates
- Terrestrial vertebrates
- Case study 1
- Case study 2
- Case study 3
- Case study 4

Each species chapter will comprise of:

- Summary with:
  - Trends and introduction
  - Pathways
  - Most invasive species with impact
  - Species prioritisation – list, methodology
- Fact sheets of selected priority species

The target groups of the book will be policy makers and administration.

Ahmet Uludag announced the forthcoming networking meeting **ESENIAS-TOOLS WG10 Meeting Two Way: Effective networking local to global and global to local**, which was planned to be organised on 8-9 December 2015, in Istanbul, Turkey.

Participants made a list of international and EU institutions, organisations and networks dealing with IAS, which may have potential collaboration with ESENIAS and their representatives can be invited to participate in the networking meeting. The following potential invited participants were identified:

*Institutions:* European Commission, EC Joint Research Center, European Environment Agency, European Food Safety Authority

*Organisations:* International Association of Danube Research (IAD), Danube Region Invasive Alien Species Network (DIAS), PA06 EUSDR, IUCN/ SSC ISSG, NOBANIS, Norwegian Biodiversity Information Centre, EPPO, SCB, CABI

*COST Actions:* Alien CHALLENGE, ParrotNET, SMARTER, Global Warning, NNEXT.



**“ESENIAS-TOOLS Open Day”, 6th ESENIAS Workshop: East and South European Network for Invasive Alien Species – A tool to support the management of alien species in Bulgaria (ESENIAS-TOOLS); ESENIAS-TOOLS Kick-Off Meeting, 27-28th October 2015 in Sofia, Bulgaria.**

The aims of the ‘ESENIAS-TOOLS Open Day’ were to:

- Present the ESENIAS-TOOLS project and preliminary results
- Share information on invasive alien species (IAS) related initiatives carried out at regional level, such as national and local monitoring schemes, risk assessments, control and eradication projects, management plans and national strategies, citizens activities and responsibilities;
- Seek further opportunities for cooperation and networking on IAS in the region and collaboration with other networks and projects, such as EASIN.

The meeting was opened with welcome speeches by Assoc. Prof. Dr. Anna Ganeva, Director of the Institute of Biodiversity and Ecosystem Research, Bulgarian Academy of Sciences (IBER-BAS), Prof. Dr. Dimitar Ivanov, Scientific Secretary at BAS, Mr Valeri Georgiev, head of the National Nature Protection Service Directorate, and Ms. Kremena Gocheva from the Coordination on EU Affairs and International Cooperation Directorate, Ministry of Environment and Water of Bulgaria.



The Open day started with three introductory presentations.

**Teodora Trichkova** presented the ESENIAS network and the ESENIAS-TOOLS project. She gave information about the establishment and aims of the network, the network structure, activities and projects. The ESENIAS-TOOLS project was presented in details with the project partners, goals, structure, working groups and case studies. The expected outcomes of the project and partnership were highlighted. Furthermore, T. Trichkova summarised the progress of the project activities, including the database development, preliminary lists of alien species, methodology, collection of field data, and presentation of project and results at scientific forums.

**Stelios Katsanevakis** talked about the European Alien Species Information Network (EASIN) for the support of European policies. His talk covered the following main topics:

the scope of EASIN; the EASIN approach and tools; the EASIN early warning system, and the EASIN scientific outputs. The new EU IAS Regulation focuses on measures on IAS of EU concern (prevention, early detection and rapid eradication, management of established IAS), as well as on actions beyond, such as pathway management, emergency measures, and action to tackle IAS of Member States concern. The EASIN approach follows two steps: integration of existing information from 41 online national, regional and global databases, and validation of the information by external experts (editorial board). Different tools were presented. Some scientific contributions, such as the assessment of pathways and distribution of alien species by pathways were mentioned.

**Ahmet Uludag** presented to the participants the new EU Regulation on the prevention and management of the introduction and spread of invasive alien species. His talk focused on the importance of regional cooperation and networking, as well as the potential role of ESENIAS in the implementation of the Regulation. He continued with the ESENIAS-TOOLS project contributions to solving IAS issues among countries in the ESENIAS countries.

The next two sessions included ESENIAS country reports.

**Rumen Tomov** made a review of IAS activities in Bulgaria in recent years. Bulgaria was a co-founder and active participant in two IAS networks – ESENIAS and DIAS (Danube Region Invasive Alien Species network). In the frames of these networks Bulgaria initiated several projects, among them two projects funded by the Financial Mechanism of EEA 2009-2014, Programme BG03 Biodiversity and Ecosystem Services in Bulgaria: the ESENIAS-TOOLS project and the IBBIS project (Improving the Bulgarian Biodiversity Information System with a task Development of a module for collecting data and risk analysis of alien species in Bulgaria). Currently Bulgaria participates in five EU Cost Actions related to IAS: PERMINT, ALIEN CHALLENGE, GLOBAL WARNING, PARROTNET and NNEXT. R. Tomov presented also some activities within the frame of the International Atomic Energy Agency Regional Technical Cooperation projects, such as Supporting fruit fly pest prevention and management; as well as the organisation of training course on Taxonomy, identification, quarantine and pest risk analysis applied to fruit flies in the Balkans and the Eastern Mediterranean. Bulgaria also participates in some EU projects on marine biodiversity and ecological assessment, which cover aspects related to IAS.

**Aljoša Duplić** presented the national report on IAS from Croatia. New IAS legislation, which will ensure the implementation of the Regulation (EU) No 1143/2014 - *Act of prevention of introduction and spread of alien and invasive alien species and their management* – is in the adoption procedure in Croatia. The new National Biodiversity Strategy and Action Plan, which includes detail activities on IAS has been also in the procedure of adoption. Croatia implements several projects on IAS, for example: Development of measures for prevention, early detection and rapid response for alien species – the pilot project of signal crayfish expansion control and eradication from the river Korana; Development of Action plan for management of IAS in the City of Zagreb; Biological control of *Dryocosmus kuriphilus* in forests of *Castanea sativa* with introduction of *Torymus sinensis*. New records of alien species were reported: Asian citrus long-horned beetle (*Anoplophora chinensis*) in Zadar County; Giant hogweed (*Heracleum mantegazzianum*) in Krapinsko – zagorska County; and Marble crayfish (*Procambarus fallax*). In 2014 the Croatian Ecological Society organised the first Croatian symposium on invasive species. The future activities planned are: the setting up of national monitoring, and information system on IAS; control and eradication of priority IAS;

and development and implementation of action and management plans, training programmes and promotion activities related to IAS in Croatia.

**Argyro Zenetos and Fabio Crocetta** presented the alien and cryptogenic species in Greece (as of October 2015) with emphasis on marine biota. The presentation covered several topics. The first one was IAS networking in Greece. The ELNAIS network – a collaborative network on aquatic alien species in Hellas (Greece) - was presented. It involves 68 experts. The ELNAIS database is offline. It uses data from different published sources, as well as from citizen scientists. Details on data flow, quality control and some examples were given. The second topic was on the importance of marine species for the implementation of EU policies in Greece, in particular the Marine Strategy Framework Directive (2008/56/EC). Criteria for good environmental status relevant to the *Descriptor 2: Non-indigenous species introduced by human activities are at levels that do not adversely alter the ecosystem* were discussed. These include: trends in new marine species; ratio between IAS and native species in some well-studied taxonomic groups; and impact of IAS at the level of species, habitats and ecosystem. Furthermore, trends in different groups were given. In marine species the number of species has increased from 193 established alien species in 2009 to 259 in 2015. Early warning was also discussed and several examples presented. Finally, it was recommended that future steps for the marine species in the ESENIAS region should include: networking; development of national databases; monitoring of target species/ hot spot areas; engagement of citizen scientists; and early warning through horizon scanning for species not yet present.

**Qenan Maxhuni** made an overview of invasive alien species in Kosovo. The new Kosovo Law on Nature Protection, improves the national policy framework on IAS in order to minimize the risk of alien species that enter and become established in Kosovo. Another important strategic document is the Strategy and Action Plan for Biodiversity 2011-2022, which defines the strategic objectives and action plans in relation to IAS. Kosovo does not have yet an official list of IAS. Based on literature sources, the number of officially known invasive alien species is 11, although this number is far from being complete. Currently there is an ongoing project for verification of the presence and distribution of harlequin ladybird *Harmonia axyridis* in Kosovo.

**Bojan Simovski** made a review of invasive alien species in the Republic of Macedonia. First he mentioned the legal national and international instruments and responsible institutions related to IAS. Then he reviewed the IAS per species groups. Potential invasive alien species of vertebrates in R. Macedonia include 5 fish and one mammal species. There are several publications and projects in progress, which focus on alien species of fungi, pathogens in agro and forest ecosystems. Most invasive plant species are found in rural habitats (roads, railroads, landfills, etc.) and some in aquatic ecosystems. Some representatives of the alien plants flora are: *Elodea canadensis*, *Ailanthus altissima*, and *Pseudotsuga douglasii*. The monitoring and research on IAS in the country is ongoing.

**Sead Hadžiablahović** presented the country report of Montenegro. It included the institutional and legal framework related to IAS in Montenegro, the main international conventions and agreements that involve IAS, ratified by Montenegro, as well as the main national laws on IAS in Montenegro. In the National Biodiversity Strategy with Action Plan (NBSAP) of Montenegro for the period 2010-2015, invasive alien species are mentioned as ‘a major threat to biodiversity’, and ‘a list of invasive alien species, particularly invasive plant species’ has been proposed. Two strategic measures related to IAS are included in the draft Action Plan of National Biodiversity Strategy 2015-2020: Developing knowledge on IAS in

Montenegro; and Improving the monitoring and treatment of ballast water. Furthermore, Mr Hadžiablahović discussed some issues about existing data on IAS in Montenegro. He mentioned some challenges and most urgent activities, which need to be undertaken. He gave some examples on most dangerous alien plant species in Montenegro.

**Dan Cogălniceanu** reported on IAS in Romania. He mentioned the existing gaps in legislation, some key publications, as well as past and ongoing projects. The he made a review of alien species per species groups. A total of 671 alien plant species, of which 112 invasive species, has been recorded in Romania. The families Asteraceae, Poaceae, Brassicaceae and Fabaceae comprise the highest number of neophytes. 44 freshwater species have been reported so far. The highest number of alien species belongs to fish and mollusks. Most of them originate from North America and Southeastern Asia. The number of alien marine species in Romania accounts to 89. About 57% of them belong to Arthropoda-Crustacea. The number of alien terrestrial species reported for Romania is 353. The highest number belongs to Insecta Coleoptera (about 18%) and Insecta Hemiptera (25%). Many of them originate from North America and Asia, but there is also a high percentage of cryptogenic and cosmopolitan species.

**Milica Rat** presented the IAS country report of Serbia. She made a review of national legislation related to IAS, mentioning that 2010 was a turning year when national legislation changed in one month. Publication and research activities in Serbia were reviewed, including projects, such as: Allochthonous Invasive Species of the Southern Invasion Corridor database (AISSIC); Biodiversity in Aquatic Ecosystems in Serbia; Alien species of algae, fungi, plants, invertebrates, and vertebrates in Vojvodina; and Studying climate change and its influence on the environment: impacts, adaptation, and mitigation. A total of 362 alien species has been recorded in Serbia by now – 1 cyanobacteria, 24 fungi, 111 invertebrate (of them 78 Insecta), 52 (of them 30 fishes), and 174 plant species.

**Ahmet Uludag** presented the country report of Turkey for 2015. It included information about key publications, databases and IAS scientific events in Turkey.

**Alberto Inghilesi** talked about IAS studies in Italy. The studies related to invasion biology in Italy focus on distribution of alien species, pathways of introduction, including the role of economic activities in the introduction of species, and case studies on biology and behaviour of species. The current results show: great diversity among taxa and regions; good knowledge on plants and vertebrates (especially mammals and fish); paradigmatic case studies among reptiles and amphibians; and great diversity among invertebrates, in particular, insects. Several case studies were discussed: on alien planarians, alien nematodes, alien species in Tuscany region. The IAS projects in Italy deal with prevention, education, mitigation of impact, control, and eradication, e.g. Control of the red swamp crayfish (*Procambarus clarkii*), mitigation of its impact on native species of crayfish and amphibians; Early detection and rapid response after citizen science report of new population; Restore native species population; Control of *P. clarkii*, *Myocastor coypus* (Coypu) and *Amorpha fruticosa* (indaco bastardo) from Tuscan wetlands. Evaluation of their impacts and environmental restoration; The american bullfrog, *Lithobates catesbeianus*; The *Trachemys scripta* problem, etc.

During the last session on the 27<sup>th</sup> October 2015, the ESENIAS-TOOLS case studies were presented.

**David Finger** presented on the dissemination of the invasive diatom *Didymosphenia geminata* in subpolar oceanic climate – a case study from Iceland. He gave information on the specificity of Iceland and the study region. He also gave details about the invasive diatom and shared some concerns about its rapid spread in Iceland. The goals, ongoing activities and preliminary results of the ESENIAS-TOOLS Case study 2 were presented.

**Nadja Ognjanova** presented the Bulgarian part of Case study 2: Comparative study on the effect of hydrological regime on the distribution of the invasive diatom *Didymosphenia geminata* in extreme environments – changes in diatom composition in the Rila high mountain lakes. She gave information about the study region in Bulgaria – the glacial Rila lakes, the methodology used, and the results of a previous study in 2000-2001, which will be used for comparison in the current case study. She also presented the project activities – field trips, sampling areas, collection and processing of samples.

**Sasho Trajanovski** talked about ESENIAS-TOOLS Case study 3: Invasive Alien Species – growing threat to biodiversity and ecosystem functionality in ancient Lake Ohrid and its watershed. He presented the study area and current situation with IAS in Lake Ohrid catchment. This included results of a previous study on Lake Ohrid tributaries and outflow Crni Drim River in 2013. The study will be extended and the results compared with these from the ESENIAS-TOOLS Case study 3.

**Dan Cogălniceanu** presented Case study 4: Estimating dispersal routes for IAS. Two possible approaches for modeling were discussed to be used for the purposes of the project depending on data collected. The first one is to model ecological niche of species in order to predict vulnerable areas to be invaded by invasive alien species; and the second one to model dispersal probability in order to identify dispersal routes of invasive alien species. The two approaches were discussed regarding availability of data and methodology and illustrated with specific case studies.

Presentation of IAS case studies from the ESENIAS region continued during the morning session on the 28<sup>th</sup> October 2015.

**Richard V. Lansdown** presented a review on alien freshwater vascular plants in south-east Europe. The study was led by him, with the participation of thirteen co-authors from ten Balkan countries. There were several issues and uncertainties, such as coverage, status, definitions and taxonomic issues. A total of 45 species were recorded from the ESENIAS countries, eight of them described as invasive. *Acorus calamus* is the most widespread of the species reported, although not considered invasive. Most of the alien species originate in the Americas. Generally, the largest countries support the largest number of taxa, but for their size, Turkey-in-Europe, Montenegro and FYR Macedonia support the largest number of species. Most countries (Bulgaria, Greece, FYR Macedonia, Montenegro, Romania, Serbia and Turkey) support a wide range of taxa. The results showed that the colonisation is increasing exponentially. The main pathways of introductions were spread from adjacent areas, rice fields and horticulture – ornamental or for food. Some recommendations were made how to prevent or even slow down the spread of invasive aquatic plants in the region.

**Stanislava Lazarevska** made a review of invasive pest insects in Republic of Macedonia important for agriculture. Based on literature sources there are 303 invasive alien species of

insects in Albania, Bulgaria, and R. Macedonia, of them 97 are found in R. Macedonia. Prof. Lazarevska made comments on the list and presented an updated list of 21 pest species important for agriculture. 15 of the species are reported in R. Macedonia, while 6 of them are found in the neighbouring countries. Details on origin, first records, current status and distribution in R. Macedonia were given.

**Necmi Aksoy** presented the check-list of alien plant species in Turkey. The number of alien plant taxa occurring in the Flora of Turkey and the last Checklist of Vascular Plants of Turkey was 242, which included 171 alien and 71 cultivated taxa. The list of Invasive alien plant species (IAS) consisted of 64 taxa, with family, life-form and geographic origin assigned to each alien plant species. The most numerous family was Compositae (Asteraceae) and the genera with the highest number of alien plant species were *Bidens*, *Conyza* and *Ambrosia*. The total number included all alien species ever recorded or surveyed in the phytogeographically of the Region, including most commonly cultivated species (e.g. in urban parks, garden centres, forest nurseries, and botanical gardens) and short-lived species. Analyses according to family affiliation, life-form and origin were made. Life-form analysis showed the predominance of hemicryptophytes but also presence of phanaerophytes and therophytes. Based on origin, alien plant species from the Americas predominate, followed by those from Asia and Africa. After the review and analyses made the list was updated and a preliminary check-list of alien plant taxa in flora of Turkey has been prepared. The number of alien species increased to 433, which includes 257 alien and 176 cultivated and ornamental taxa. Out of 90 families the majority belong to Angiospermae.

**Milka Glavendekić** talked about the development of awareness about IAS among professionals in horticulture industry and landscaping in Serbia.

