NEWSLETTER III

June, 2015

UNIVERSITY OF
EASTERN FINLAND

Saimaannorppatutkimus UEF
Saimaa ringed seal research

Welcome to the third Wildlife Photo-ID newsletter!

We are pleased to present the third Wildlife Photo-ID network newsletter, keeping you informed of the progress in our project and of other connected issues. Of course, we appreciate a lot if you forward this newsletter to interested colleagues and potential interest groups.

This issue will bring you the latest information about the proceedings of the workshops held in Finland so far (pages 2-6). The third and last workshop of Wildlife photo-ID network will be held in early September 2015 in Helsinki, Finland (page 7), co-hosted by WWF Finland (page 9).

The Wildlife Photo-ID workshop info is available on our website (www.uef.fi/fi/photo-id) and you will find us also on Facebook (www.facebook.com/groups/photo.identification/).

Our goals

International Wildlife Photo-ID network workshops are funded by the Finnish Cultural Foundation. The workshops bring together experts in the fields of wildlife ecology, conservation, monitoring, photo-ID, crowd sourcing and computing from several different countries. The workshops aim at developing different photo-ID methods for several animal species, including automatic applications, especially focusing on implication for endangered species research and monitoring. The workshops offer great opportunities for researchers to network.

Second workshop was held in February 2015 in Koli, Finland

Altogether 33 experts from 14 different countries participated to the workshop. The theme of the second workshop was especially data analysing. We were again very happy to get such a great speakers from all over the world. All the speakers expanded the knowledge of photo-ID methods, data handling and analyses on different animal species. The talks were showed live via our website link, and over 30 guests were following the talks via internet.

Read more thoughts on the second workshop by Peppi Stünkel on next pages. Very interesting outputs from our first workshop by Renate Reijns and Jurgen den Hartog can be found on pages 5 and 6.

We hope that you enjoyed the content of the workshop and we look forward meeting you in September (read more in page 7)!

Thoughts on the second photo-ID network workshop by Peppi Stünkel

The photo-ID workshop held in Koli, Finland in February 2015 and organized by the Wildlife Photo-ID network, funded by the Finnish Cultural Foundation was a unique opportunity to meet with and learn from photo identification experts from 14 different countries. Wildlife photo identification is in many ways an interesting area of study, especially as it involves experts from so many different fields, such as wildlife conservation experts, IT experts, photographers, biologists, scientists and many more. During the 2nd workshop the key-note speakers talked about dolphins, tigers, whales, lynxes, sea turtles and penguins as well as different approaches for photo identification studies and data analysis. The speakers from distinguished universities such as St. Andrews, Oxford, Duke, Hong Kong, Eastern Finland as well as Amity Institute of Wildlife Sciences, Life+IBERLINCE Project by the Andalusian Government and the NGO Fundación Yepez, shared their experiences and learnings.

I would like to thank the Wildlife Photo-ID network team at the UEF for organizing the event and for giving us all the opportunity to learn from each other, network and collaborate in order to grow and develop our projects. It became even clearer than before how important it is for us to collaborate with the experts from all these different fields. For example, we as sea turtle conservationist out in the field need to work closely with the photo-ID software developers in order to choose the most appropriate program and digital asset management system to ensure we get the best use out of the program. Following data capture, storage and analysis we need to work with and learn from the data analysis experts out there to help us with the mark-recapture analysis of our photo-ID data to estimate population parameters.

Many ideas surged during the workshop and all are a result of the information exchange and opportunity to network with other participants. For our work with the sea turtles, we hope to work alongside our fellow sea turtle identifiers to streamline sea turtle photo-ID databases, metadata and capture techniques in order to avoid re-inventing the wheel and to move forward on a global level and make optimum use of the data already available. We at the Yepez Foundation strongly believe that it is by sharing data, such as photo identification databases and results that we can truly begin to see greater results in the research and by applying these learnings into the conservation methods make the drastic change needed to save these endangered species from extinction.

We want to work together with the members of this network, to establish global criteria, methods and techniques and share our databases to establish global catalogues, or make the most of the existing tools already available and allow cross-research. Some of the other take-aways from the workshop for us were; the recommendation of using black flash to get better and less invasive shots at night, combining the use of PIT or satellite tracking devices with the photo-ID method and researching into survival rates as opposed to population size. Our long-term goals and dreams also entail the use of long distance drones, photo identification of more sea turtle species and maybe even in the distant future, hatchling to adult recognition. Mostly we look forward to collaborating with and continuing to learn from the participating experts in the field.

The Wildlife Photo-ID network is the perfect stage for continued dialogue about best practice, software, analysis and more than anything a streamlined wildlife photo-ID future and we look forward to the next workshop in September as well as many more in the future. To the organizing team and everyone present, thank you for sharing your experiences, insights and expertise.

All the best from,
Peppi & the whole team in Mexico
www.tortugasfundacionyepez.com

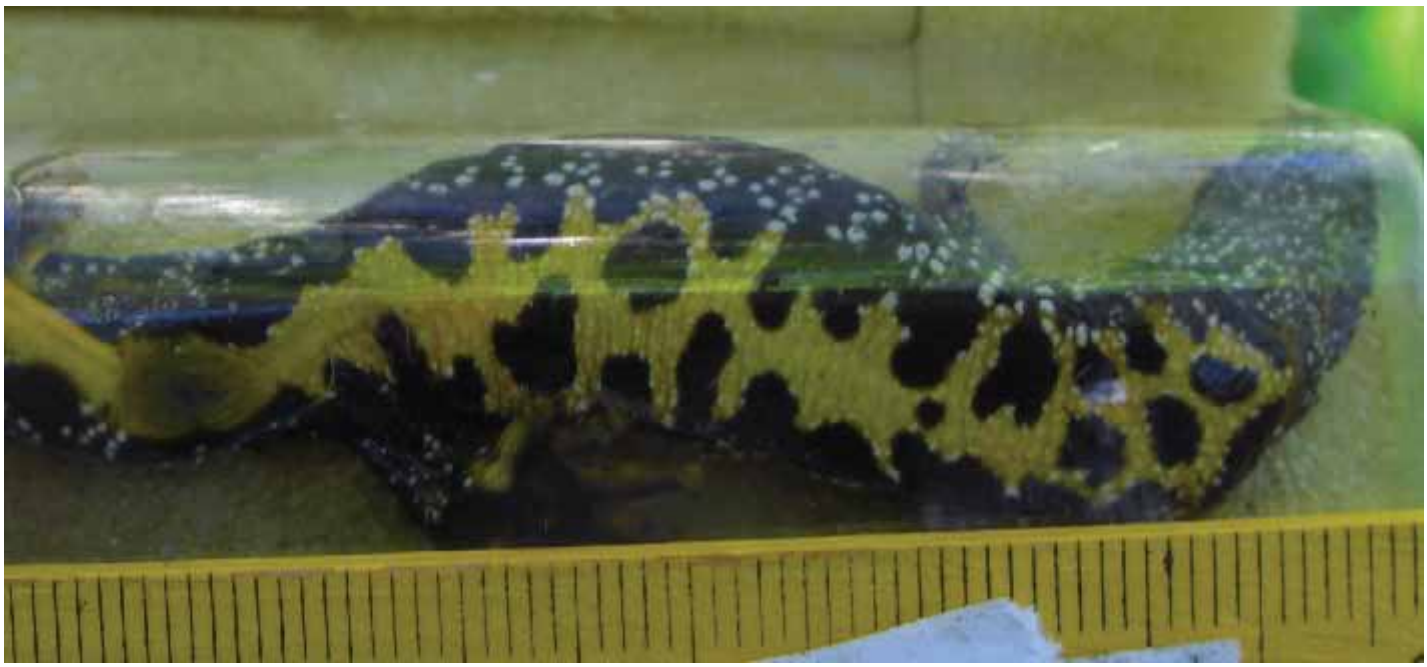
How the Joensuu workshop resulted in two new I3S tools

Renate Reijns & Jurgen den Hartog

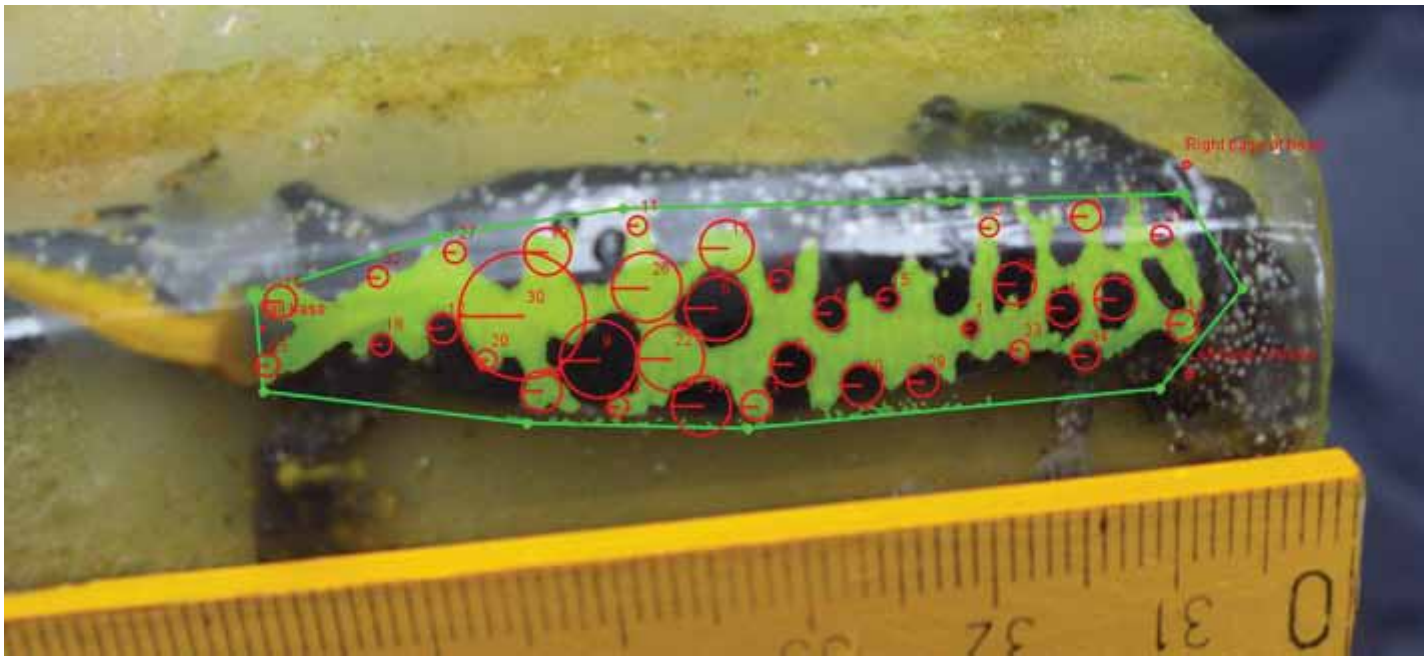
The first International Wildlife Photo-ID network workshop was held in November 2014 in Joensuu and we had the great opportunity to give a keynote talk about our work on I3S. We really enjoyed participation in the workshop. Usually contact with our users is limited to e-mail and the occasional Skype, but now we could directly talk and discuss user needs face to face. At the workshop we came in contact with Ville Vuorio and Olli-Pekka Tikkanen who study the Great Crested Newts using photo-identification. Although these animals have a very clear and distinctive yellow belly pattern, the photos showed newts in all kinds of twisted positions making automatic recognition quite hard. At the workshop we promised to come up with a working solution and Ville and Olli-Pekka delivered a dataset right away. However, as is often the case, at home things turned out a little bit harder than anticipated.

First we made a pre-processing tool, I3S Straighten, to correct for the pose of the animals. Basically, you click along the curved body of the animal and Straighten will stretch it out for you to a straight image, to have each belly pattern in the same general shape. The tool is limited to 2D-straightening, so it will work as long as the animals are flat on their belly. This pre-processing step certainly improved performance, but when using I3S Pattern on the straightened images accuracy was still not great. At the same time Dr. Nicolas Chalwatzisfrom Germany who is studying yellow-bellied toads (Bombina Variegata) asked us for help as he had exactly the same problem. It turned out that with the toads the belly pattern stays the same, but the intensity of and details in the pattern and the parts in between varies with age. Automatic key point extraction often had trouble finding consistent key points. Similar problems were found in the newt dataset.

Our solution was to develop an adapted version of Pattern, for the moment called Pattern+. In Pattern+ the user indicates with a few examples what is the belly pattern and what is not. From these examples I3S learns to make the distinction for the entire image. Next, the recognition area in the image is reduced to two values, pattern and non-pattern. This extra step forces I3S to only take the shape into account and ignore the various details which may change over time. The accuracy immediately increased to somewhere around 96% - 97% for the top 3 best matching results on our data. Results will further improve with some adaptations to the image acquisition procedure for the newts. On the I3S YouTube channel you can find some demonstration videos of both Straighten and Pattern+.



Newt makeover by I3S Straighten: before and after.



Newt image with the belly pattern in transparent green and the corresponding key points.

The beta version of both Straighten and Pattern+ has been available upon request for a few months now, and we have received a lot of attention from the amphibian research community asking to test the beta version as well!

Further, Olli-Pekka, Ville and other researchers came up with different ideas to improve the user interfacing of I3S. We really missed this kind of input in the last years so we were very happy with this! We have been implementing these requests in the last weeks and made them available to the testers. As these are all general improvements they will find their way as updates to all existing I3S packages as well. Beta-testing on the newt data by Olli-Pekka revealed that there are still some improvements possible with respect to accuracy. As soon as the analysis is complete we will look into the causes and correct the algorithm or software. However, Olli-Pekka also made clear that I3S Pattern+ is easy to use and already allows for meaningful population size analysis!

We aim to have both I3S Straighten and Pattern+, as well as the updates to the other packages, available as an official release when this newsletter is published.

Without the first workshop in Joensuu all these new developments would never have happened. We really want to thank the team for organizing the workshops and all the opportunities that resulted from them. We really hope to be there at the final workshop in September in Helsinki!

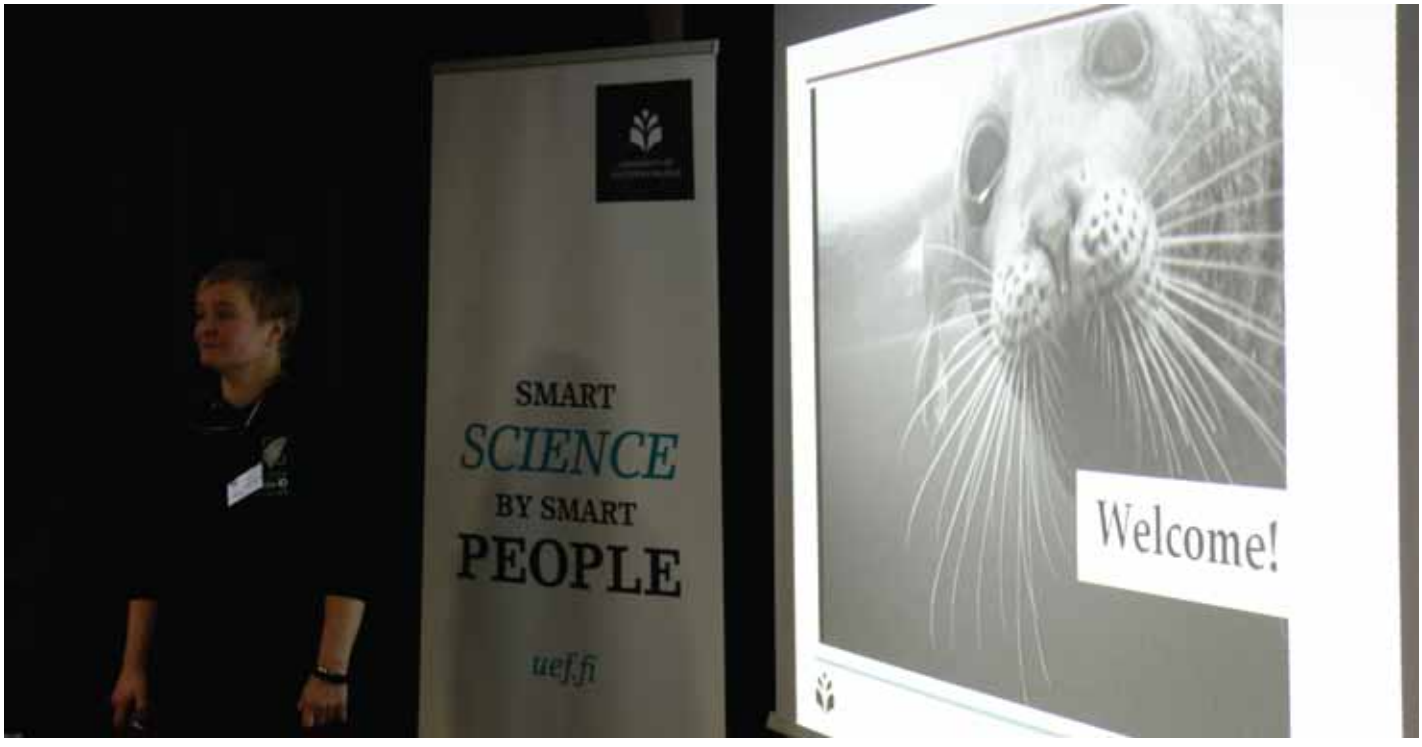
The Third Workshop 2015

The third workshop will be held in early September (1-4) in Helsinki, Finland. WWF Finland will be co-hosting this last worksop of Wildlife Photo-ID network.

The main theme of this third workshop is photo-ID catalogues, other applications and crowd sourcing. Some keynote speakers have already confirmed their participation (changes to the topics are possible):

Daniel Rubenstein: IBEIS system and the Hotspotter ID recognition system
Tom Hart: Large – scale automated monitoring of seabirds enabled by citizen science
Sai Ravela: Learning Total Recall: The MIT Sloop System for Individual Identification
Kim Urian: Building web-based collaborative photo-identification networks to better understand cetacean population structure
Tom Jenkins: A new photo-ID app aimed at both researchers and tourists
Tuomas Eerola: Seal Vision: Automatic segmentation and identification of Saimaa ringed seals
Ted Cheeseman: Finding and engaging user groups for crowd sourcing
Isla Graham: Integrating photogrammetry with individual based photo-ID studies to support conservation and management of protected marine mammal populations
Olli-Pekka Tikkanen: Newt, *Triturus cristatus,* photo-ID
Suwat Jutapruet: Dolphin and Whale Watching Online Monitoring System by Tourist's Smartphone
Valerie Chosson: Icelandic humpback whale photo-ID database
Jillian Hudgins: Using a citizen science photo-ID data collection program to determine the population of foraging sea turtles in the Maldives
Aaron Mason: Monitoring keystone species through photo-ID
Meeri Koivuniemi / Mika Kurkilahti : Saimaa ringed seal photo-id
David Borchers: Spatially Explicit Mark Recapture
Emma Carroll: How DNA-profiles link in with photo-ID

The call for the third workshop is now open.
Please contact us (photo-id@uef.fi) if your expertise fits to our themes.



Building web-based collaborative photo-identification networks to better understand cetacean population structure

Kim Urian and Ei Fujioka
Nicholas School of the Environment, Duke University

Photo-identification provides insight into population structure and connectivity, but its use can be complicated when animals move across the study areas of individual researchers. To facilitate the broadest possible collaboration, we developed a web-based platform that allows researchers to exchange images and data, regardless of their location. This portal is a component of the Ocean Biogeographic Information System Spatial Ecological Analysis of Megavertebrate Populations (OBIS-SEAMAP). OBIS-SEAMAP includes a growing number of datasets derived from photo-identification research, so we developed an online workflow and set of tools to allow researchers to compare photo-id images. We first established this application for the Mid-Atlantic Bottlenose Dolphin Catalog, which contains images of approximately 10,000 individual dolphins from 28 sites ranging from New Jersey to Florida, USA from 1979 to the present. The web-based system has now been customized for use by four other collaborative catalogs (bottlenose dolphins from California and the Gulf of Mexico, spinner dolphins in the Pacific Islands, killer whales in California). Contributors can browse catalogs of interest, identify potential matches, examine sighting maps and histories. If a potential match is identified, a form is circulated via email; if confirmed, the system links the database records. We are interested in applying this framework to other species, geographic regions and groups of researchers. The system allows contributors to collaborate more effectively across geographic and institutional boundaries and provides an archive of data and images, which is particularly important for historic datasets. The system may also be utilized for public outreach and as an interactive tool to promote awareness of the animals we study. Collaborative, online projects such as the photo-ID portal in OBIS-SEAMAP are powerful tools for the management and conservation of cetaceans because they allow for the generation and sharing of information on population structure and distribution patterns.

Kim Urian will be giving an interactive talk at the third workshop.

WWF FINLAND

WWF Finland was founded in 1972. We are an independent part of the international WWF network. WWF works in Finland and its surrounding areas to protect endangered animals and habitats.

WWF protects Saimaa ringed seals, Baltic ringed seals, White-tailed Eagles and Lesser White-fronted Geese as well as many other species. We also protect traditional Finnish environments and promote the biodiversity of forests and economically and socially sustainable forestry industry. WWF protects the Baltic Sea and Finnish inland waters by preventing eutrophication, improving oil spill response and promoting marine safety and sustainable fishing. Together with field work, political lobbying and expertise work are significant parts of WWF's work in protecting the Baltic Sea.

We work to decrease the environmental effects of human actions, i.e. the ecological footprint. Our work includes promoting sustainable consumption and production, mitigating climate change and decreasing water consumption along with its environmental effects.

WWF Finland works to protect nature in developing countries in Asia and Africa. The objective of the work is to protect forests and the species that inhabit them, as well as to improve the living conditions of local people. All projects of WWF Finland are parts of WWF's international major projects in which many WWF offices participate. WWF Finland's projects are carried out together with local WWF offices.

Environmental education and communication
It is important to share the challenges, solutions and accomplishments in nature conservation with many parties: ordinary people, companies and political decision-makers. By communicating, we can influence people's attitudes and practices.

WWF reaches a large number of Finns with its communication and campaigns directly and through media. In addition, WWF publishes different kinds of guides, brochures and reports, for example the widely popular Consumer's Seafood Guide.

Nature conservation is also working together with children and young people. With environmental education, the new generation is taught to love and respect nature and understand that humans cannot survive without it.

Have a great summer!

The Saimaa ringed seal research group of University of Eastern Finland (UEF) coordinates the workshops.

organizing committee of the workshop: Mervi Kunnasranta* (chair), Marja Niemi*, Markku Tukiainen, Riikka Levänen and Meeri Koivuniemi* (coordinator)

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We are always pleased to hear your comments and opinions on anything relating Wildlife Photo-ID network and/or coming workshops. If you have any questions or suggestions, please do not hesitate to contact us by e-mail (photo-id@uef.fi) or Facebook.

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