Research Networking Programme

Research and Monitoring for and with Raptors in Europe (EURAPMON)

Standing Committee for Life, Earth and Environmental Sciences (LESC)

The aim of EURAPMON is to strengthen the contribution of research and monitoring for and with raptors in Europe to deliver biodiversity, environmental and human health benefits, including maintenance and recovery of raptor populations and their habitats, and reduced chemical threats to ecosystems and human health.

Biodiversity loss and contamination have significant environmental, social and economic impacts. Consequently, environmental monitoring has a fundamental role to play in shaping our environmental, social and economic futures. As we cannot hope to monitor all components of the environment, we must seek to monitor those which can most usefully inform, at affordable cost. Raptors offer considerable promise in this respect. They are typically large and relatively easy to observe and identify. Their presence and absence is soon noted. As top predators, they respond to a range of environmental pressures, such as habitat change, change in prey populations, contaminants, and human disturbance, often with considerable sensitivity; indeed, their value as indicators has been proven, for example in revealing the hazard of DDT. And they are already the subject of considerable low-cost monitoring efforts in Europe.

However, the picture across Europe remains patchy. There is a need to reinforce national and sub-national initiatives and improve coordination at pan-European scale. This applies both to monitoring largely focused on the health of raptor populations themselves (monitoring 'for' raptors) and to monitoring largely focused on what raptors can tell us about the environment (monitoring 'with' raptors).

EURAPMON's objectives are: (1) to establish a sustainable and resource-efficient Europe-wide network for monitoring for and with raptors, linked to international networks; (2) to establish consensus on Europe-wide priorities for monitoring for and with raptors, based on a comprehensive inventory of existing monitoring and of needs of key users (policy makers, risk assessors, environmental managers); (3) to spread best practices and build capacities in Europe for harmonised monitoring for and with raptors; and (4) to build a web-based database, populated with interoperable data on European raptor populations and (contaminant and other) pressures on raptors in Europe, and to produce European- and EU-scale analytical outputs which meet priority user needs.

The running period of the ESF EURAPMON Research Networking Programme is for five years, from May 2010 to May 2015.

Scientific Background

The need for sentinels

Continuing loss of biological diversity and growing recognition of the extent to which prosperity and wellbeing depend on ecosystem services has led to EU and global commitments to reduce biodiversity loss and assist the recovery of degraded ecosystems. As the drivers of biodiversity loss intensify – not least climate change – forecasting ecosystem change becomes vital and species groups that function as 'sentinels of change' become critical monitors and predictors of successful mitigation and adaptation.

The promise of raptors as sentinels

Top predators are particularly valuable in this respect, none more so than predatory birds which are widespread, are particularly sensitive to environmental change at various scales, and are among the first organisms to exhibit readily observable responses. Raptor monitoring can convey important environmental information, not least because raptors integrate a range of specialist and generalist food chains and live across wide geographic areas. The causes of changes in raptor populations may be natural, or related to human impacts, needs or desires. There are few monitoring systems that can facilitate – in the way that raptors can – work on everything from habitat loss, through disease to chemicals. Raptors are a window onto the overall functioning of the environment.

Timeliness of a raptor monitoring network

Recent developments in EU policy make a step-change in research on and monitoring of raptors particularly timely. First, the EU has a new biodiversity strategy setting key objectives and targets to 2020. These include a target (Target 1) to halt deterioration in the status of species and habitats covered by EU nature legislation (this includes most raptors and their habitats) and to achieve a significant and measurable improvement in their status. Presently, 64% of Europe's 56 raptor and owl species have 'unfavourable conservation status' in Europe and, while more species increased than decreased in EU states in the 1990s, the opposite was true in eastern Europe. Research on and monitoring of raptors to support raptor conservation – which we term 'monitoring *for* raptors' – will help meet the EU target, including required action to improve and streamline monitoring. The new EU

Figure 1. Great grey owl *Strix nebulosa* fledgling

biodiversity strategy also includes a target to improve knowledge of ecosystems (and their services) in the EU. Research on and monitoring of raptors for this purpose – which we term 'monitoring *with* raptors' – can provide relevant indicators of ecosystem health. Second, networked monitoring *with* raptors is needed to support the EU's chemicals regulation, REACH, which requires improved knowledge on the fate of contaminants, especially those compounds of highest concern (persistent, bioaccumulative, toxic) and likely to end up, via food webs, in top predators. Indeed, the European Parliament has stressed the importance of understanding bio-accumulation in top predators such as raptors. The value of this is illustrated by the early work (in the 1960s and 1970s) on peregrine falcons, sea eagles and ospreys which highlighted the harmful effects of dieldrin, DDT and mercury. Finally, the Convention on Migratory Species (CMS) concluded in 2008 a Memorandum of Understanding on Migratory Birds of Prey (MoU-BOP) and this has recently been endorsed by the EU. EURAPMON offers a timely opportunity to deliver key research and monitoring actions under the MoU in Europe, and to support similar actions by parties to the MoU in the Middle East, Africa and Asia.

Limitations of existing networking and needs to be addressed

Despite a substantial body of work in Europe on monitoring for and with raptors, weaknesses remain in bringing this together at a European scale. There has been no comprehensive inventory of past and current effort, and no comprehensive assessment of user needs at the European scale. While several bodies provide certain elements towards an effective European network – most notably BirdLife International's European

Figure 2. Lanner falcon *Falco biarmicus feldeggii* nestling © M. Lo Valvo

Partnership, the European Bird Census Council (EBCC), Monitoring of Raptors and Owls in Europe (MEROS) and the Raptor Research Foundation's 'Eurasian Raptor Monitoring Scheme' (which focuses on migratory species) – these do not add up to an integrated European-scale network of monitoring *for* and *with* raptors. At the European scale, work on monitoring *with* raptors is particularly under-networked, and poorly integrated with work on monitoring *for* raptors. Moreover, capacities and monitoring historical effort vary widely between countries of the ESF Member Organisations. Consequently, there remains much to be done in terms of: identifying key monitoring gaps (e.g. certain species, parameters, geographical areas) against user needs; building consensus on and capacity to apply best practice, harmonised methodologies and quality standards to ensure data interoperability; construction of an effective database which integrates '*for*' and '*with*' data for the whole of Europe; analysis to detect and explain European- and EU-scale patterns in the data; and production of outputs better tailored to the needs of policy-makers, risk assessors and environmental managers at these scales.

The genesis of EURAPMON

A first workshop to explore the potential for development of a European raptor monitoring network was convened in Sicily in 2006, bringing together around 30 participants. The key output of the workshop was a 'skeleton proposal' for such a network, and a core group of interested researchers who subsequently worked together to develop this in to the EURAPMON proposal. The workshop also resulted in publication in 2008 of a Special Issue of *Ambio* (Issue **37**[6]) on *Monitoring for and with raptors in Europe*. This Special Issue was supported financially by many of the institutions to which EURAPMON participants belong, as well as by the Secretariat of CMS.

Figure 3. Peregrine falcon *Falco peregrinus*

How will EURAPMON deliver?

EURAPMON will deliver through eight work packages:

- **Networking** throughout Europe and with international networks worldwide.
- **Inventory of existing monitoring activities**, in order to provide a picture of what monitoring is being done where, and by whom.
- **Identification of user needs**, with a focus on users at European and national scales.
- **Development of consensus on priorities** to enhance monitoring and meet user needs, at the European scale.
- **Setting and sharing good and best practice**, including making this available through the EURAPMON website.
- **Capacity-building**, including through short exchange visits.
- **Establishing a web-based database**, bringing together published studies and datasets, and producing analytical outputs and reports at the European scale.
- **Fundraising**, through the development and submission of related proposals to support expansion/continuation of raptor monitoring in Europe.

Much of EURAPMON will be delivered by means of science meetings. Larger meetings will be held to bring together all areas of activity, while smaller workshops will be held to address specific work packages. The EURAPMON Inaugural Workshop was held in Sicily in October 2010. Over 50 scientists attended from leading research groups, government agencies and conservation groups from 25 countries across Europe, from the Atlantic to the Urals, and from the Mediterranean to the Arctic Circle. Beyond Europe, participants attended from Russia, Belarus, Georgia, Israel and the US. The workshop elaborated scientific and technical

proposals for the implementation of the programme.

The geographical scope of EURAPMON is continent-wide, and includes Greenland, Russia to the Urals, the Caucasus and the whole of Turkey.

Who may participate in EURAPMON?

EURAPMON is open to all interested participants. Participants are drawn from most countries having ESF Member Organisations, from other European countries, and from key international organisations, including the UNEP/CMS Secretariat, BirdLife International, MEROS and the Raptor Research Foundation. EURAPMON has access to a significant proportion of leading and emerging expertise and facilities for such work in Europe. Our multidisciplinarity (raptor ecotoxicologists, ornithologists, ecologists, conservation biologists) will enable development of new leading-edge methods for early detection of environmental change, determination of drivers of change (with levels of certainty) and prediction of emerging problems (e.g. based on combined ecological, chemical, metabonomic and/or genomic techniques). This should effectively position raptors as sentinels of the health of European ecosystems.

What are the expected outcomes of EURAPMON

In order to deliver its objectives, EURAPMON will go significantly beyond coordinating existing networks, by achieving the following key outputs:

- **A sustainable and resource-efficient Europe-wide network for monitoring for and with raptors**, with active engagement of most, if not all, groups involved in raptor monitoring, linked to international networks.
- **A comprehensive inventory of existing monitoring for and with raptors in Europe**, including: which species are monitored; geographical areas over which monitoring takes place; scales of monitoring programmes, timeframes, periodicity; biological/ecological parameters monitored, methods; contaminants monitored, tissues sampled, methods; human resources (staff, volunteer), skills held, training needs; facilities available.
- **A comprehensive assessment of needs of key users** (policy makers, risk assessors, environmental managers), including: data required; analysis required; required periodicity of data, analyses, reports; formats information is required in; resource-efficient delivery mechanisms; assessment against these needs of the extent to which they may currently be met, opportunities and costs of being better met.
- **Achievement of broad Europe-wide consensus on priorities** among participant groups, including: priority species for monitoring for and with raptors; priority scales for monitoring; priority geographic

Figure 4. Sea eagle *Haliaeetus albicilla* nestling

areas; preferred periodicity for monitoring; priority parameters to monitor; priority contaminants to monitor (and priority tissues to sample); priorities for methodological harmonisation/standardisation; priority needs for skills, facilities; priority user-oriented outputs at European and EU scales.

- **Best practice guidelines and protocols available on web** (and possibly in print), including for: fieldwork, sampling, preparation, analyses; analytical quality assessment, quality control; data management, intercalibration, statistical approaches (e.g. power analyses of sampling strategies); reporting, etc., building on existing best practice guidance.
- **Enhanced capacities** for monitoring *for* and *with* raptors in Europe in line with best practice, in particular in those European countries currently lacking in skills and resources.
- **An operational web-based database producing analytical outputs for users**: an online database of a) monitoring programmes and activities, b) analysed raptor population/trend data (not raw data) and c) contaminant (and other pressure) data in Europe, linked to national and participant databases. European- and EU-scale analytical outputs (e.g. on species status and trends, current and emerging contaminant hazards, indicators) to meet user needs (e.g. statutory reports under Birds Directive, chemicals assessments for REACH, assessment of effectiveness of EU biodiversity policy).
- **Adequate funding secured** to sustain the ongoing network and relevant activities beyond the ESF-funded period.

What are the expected benefits of Europe-wide collaboration in this area?

Wider benefits will include maintenance and recovery of raptor populations and their habitats and reduced chemical threats to ecosystems in Europe. Healthier ecosystems will be more resilient to climate change and more able to sustain delivery of vital ecosystem services for human wellbeing. Thus, expected benefits extend beyond science to environmental, social and economic benefits.

Immediate benefits will include: (1) the establishment of a sustainable and resource-efficient Europe-wide network for monitoring *for* and *with* raptors, linked to international networks; (2) broad European consensus on priorities for monitoring for and with raptors; (3) wide diffusion throughout Europe of best practices and significantly enhanced capacities for harmonised monitoring; (4) a web-based database, populated with interoperable data on European raptor population trends and (contaminant and other) pressures on raptors in Europe, producing European- and EU- scale analytical outputs (indicators of population trends, risk assessments, early warning of emerging threats, etc.) which meet priority needs of key users in policy, risk assessment and environmental management communities.

Some more **specific benefits** include: enhanced competitive edge for Europe in these research areas; emergence of European centres of excellence (raptor data management, contaminant analysis); more integrated analysis and cause-effect understanding at the European scale of drivers, pressures, state, impacts and responses related to raptor populations; better understanding of large-scale and long-term patterns in the data (e.g. significance of accidental/intentional poisoning including acute incidents,

Figure 5. Inaugural Workshop participants, Riserva dello Zingaro, Sicily, Italy, October 2010 © F. Duke

distribution of contaminants, population trends in relation to environmental change); knowledge to help EU member states report on raptor 'conservation status' (required by EU nature directives); a new indicator to evaluate European progress on halting the loss of biodiversity; support to REACH in providing integrated indicator of success, highlighting where improvements needed, prioritising chemicals in need of risk assessment; better identification of European-level research priorities; a better science-policy interface promoting appropriate policy responses.

EURAPMON website

The ESF-based EURAPMON website (www.esf.org/eurapmon) provides information on EURAPMON topics, organisation and activities. In addition, the external EURAPMON website (www.eurapmon.net) will provide, *inter alia*: a directory of existing monitoring in Europe; information on the related needs of policy-makers, conservation managers and other end users; information on priorities to enhance research and monitoring for and with raptors in Europe; best practice guidelines and protocols; information on EURAPMON science meetings and links to related external events; calls for exchange visits; a directory of EURAPMON participants; the EURAPMON database; EURAPMON science meetings and other reports and publications, and the minutes of steering committee meetings.

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For the latest information on this Research Networking Programme consult the EURAPMON websites:
www.esf.org/eurapmon
www.eurapmon.net

Cover picture: Red kite *Milvus milvus*

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