

## SHORT TERM SCIENTIFIC MISSION (STSM) SCIENTIFIC REPORT

This report is submitted for approval by the STSM applicant to the STSM coordinator

**Action number: CA16224**

**STSM title: Lead monitoring in raptors around Europe**

**STSM start and end date: 07/01/2019 to 18/01/2019**

**Grantee name: Laura Monclús Anglada**

### PURPOSE OF THE STSM:

(max.200 words)

The **main objective** of this action was to prepare the basis for a peer-reviewed paper summarizing all the existing data on lead monitoring in raptors in Europe by performing a literature survey.

To this purpose, three specific objectives were defined: **Obj. 1** Define the key questions to extract information from the literature review; **Obj. 2** Build a matrix with all the existing papers, extracting key information; and **Obj. 3** Structure the skeleton of the review, drafting the titles and subtitles.

The candidate worked from the 07/01/2019 to the 18/01/2019 at the host institution Leibniz Institute for Zoo and Wildlife Research with total access to online library services and fully equipped office.

### DESCRIPTION OF WORK CARRIED OUT DURING THE STSM

(max.500 words)

The activities performed during the STSM to reach the three specific objectives explained above were the following:

Obj. 1: Define the key questions to extract information from the literature review

- ✚ **Quick search of the existing reviews** on heavy metal contamination published so far, focusing particularly on lead contamination.
- ✚ **Screen** the main reviews revising their objectives, papers included in the revision and year of realization to define the state-of-the-art on lead monitoring data in raptors in Europe.
- ✚ **Define the main questions** to be answered in the review and the **key information pursued**.
- ✚ **Prepare the excel matrix** breaking down the questions into specific Yes/No questionnaire or multiple answer.

Obj. 2: Build a matrix with all the existing papers, extracting key information

- ✚ **Quick search on Web of Science** with the keywords “lead”, “Pb”, “raptors” and “birds of prey” to know how many papers result from that search, redefine the keywords and the searching tools.
- ✚ **Definition of keywords and clusters.** From the previous search, we defined the following keywords and clusters:
  - 1st cluster: (Lead OR plumbism OR Pb) AND (raptor\* OR “bird of prey” OR “birds of prey” OR falcon\* OR accipitr\* OR strigiformes)

- 2nd cluster: (Lead OR plumbism OR Pb) AND (raptor\* OR “bird of prey” OR “birds of prey” OR vulture\* OR hawk\* OR owl\* OR eagle\*)
- 3rd cluster: (Ammunition OR heavy metals OR Lead) AND (raptor\* OR “bird of prey” OR “birds of prey” OR falcon\* OR accipitr\* OR strigiformes OR vulture\* OR hawk\* OR owl\* OR eagle\*)

✚ **Use of three different web pages as the main research tools:** Web of Science, PubMed, Science Direct. Also, Google Scholar was used to screen the first one thousand papers to confirm we had not missed any paper.

✚ **Check the papers cited in the most recent reviews of lead in raptors** to confirm we had not missed any paper.

Obj. 3: Structure the skeleton of the review, drafting the titles and subtitles

✚ **Skeleton of the review.** Draft of the titles and subtitles of the review following the questions defined in Obj. 1.

## DESCRIPTION OF THE MAIN RESULTS OBTAINED

(max.500 words)

The results obtained from the STSM are the following (classified by specific objectives):

Obj. 1: Define the key questions to extract information from the literature review

- Folder containing the main reviews published in heavy metals (lead) monitoring.**
- List of the main questions to be answered in the review**, building a questionnaire to be used in the excel matrix to classify papers and extract key information.
- Skeleton of the excel matrix following the questionnaire.**

Obj. 2: Build a matrix with all the existing papers, extracting key information

- Excel file with of all the papers published so far, extracting the main information** (title, authors, journal, year of realization), listed in different columns according to those found in Web of Science, PubMed, Science Direct, Google Scholar or in reviews revised.
  - In total, 292 papers were found and listed with a number from 1 to 292 following the chronological order of their finding.
- Folder with all the papers downloaded** and listed with the reference number previously given in the excel file.
- Excel matrix with the questionnaire answered.**

Obj. 3: Structure the skeleton of the review, drafting the titles and subtitles

- Word file with the structure and main section of the review**, including the headings and sub-headings and a brief description of the graphs/tables to be included.

Overall, the output of this STSM has been the revision of all papers published (from the 1974 to the 2018) in lead contamination in raptors, resulting in a dataset with all papers organized by author, year of publication and country, and the key information extracted and summarized (see Table 1), as well as in a draft with titles, subtitles, figures and tables building the skeleton of the review.

**Table 1.** Key information extracted from literature survey constituting the columns of the excel matrix.

- Reference	- Wildlife Centers (data source)	- Units
- Authors	- Time frame of the study	- Techniques
- Year of publication	- Species	- Source of contamination
- Type of publication	- Type of sample	- Isotopes
- Journal	- Sample size	- Sex-differences lead
- Review	- Age of birds	- Age-differences lead
- Experimental	- Sex of birds	- Comparative-differences lead
- Observations/Relevance	- Alive/Death/Symptoms	- Effects

- |             |                            |                            |
|-------------|----------------------------|----------------------------|
| - Country   | - Comparative (obj. study) | - Mortality                |
| - Continent | - Lead concentrations      | - Reproduction constraints |

**FUTURE COLLABORATIONS (if applicable)**

(max.500 words)

The candidate is currently working on the review. After finishing the STSM, she has started analyzing the data obtained from the literature survey, resulting in the firsts graphs that will constitute the review. First, she has analyzed the number (an proportion) of papers published in Europe and outside Europe (North America, South America, Africa, Asia, Oceania). Then, she has focused on the tendency by years, species studied and types of sample used. With this information, the candidate is working on a powerpoint presentation for the next COST meeting at Firenze (March 2019).