

Project information

Project title

Effects of pollutants and other stress factors on raptors

Year

2011/2012

Project leader

Jan Ove Bustnes, NINA

Participants

- Jan Ove Bustnes, NINA
- Dorte Herzke, NILU
- Sveinn Are Hanssen, NINA
- Adrian Covaci, University of Antwerpen
- Christian Sonne, DMU

Flagship

Hazardous substances, Theme: Animal health and ecosystem

Funding Source

Fram Centre

Summary of Results

This project involves NINA and NILU along with numerous international collaborators, and studies the effects of toxicants and other stress factors on birds of prey. Several effect parameters are measured over several years; oxidative stress, immunology and blood parameters, and how these parameters are affected by pollutant levels. In 2011 we have focused on sea eagles, and fieldwork has been conducted in Troms in June. Blood samples and ecological data have been collected from 20 sea eagle chicks. The data shows that pollutants, such as organochlorines and perfluorinated compounds have potential negative impacts on blood parameters in raptors (Sonne et al. 2010, submitted). Furthermore, the project has among other results documented POPs in both blood and feathers of raptors, and how this is related to diet of the chicks and adults (Eulaers et al. 2011, manuscript).

Published Results/Planned Publications

Sonne, C., Bustnes, J.O., Herzke, D., Jaspers, V., Covaci, A., Halley, D., Minagawa, M., Moum, T., Eulaers, I., Ims, R.A., Hanssen, S.A., Erikstad, K.E., Johnsen, T.V., Shnug, L. & Jensen, A.L. 2010. A pilot study of organohalogen contaminants and blood plasma clinical-chemical parameters in chicks of three raptor species from Northern Norway. *Ecotoxicology and Environmental Safety* 73: 7-17.

Eulaers, I., Covaci, A., Herzke, D., Eens, M., Sonne, C., Moum, T., Schnug, L., Hanssen, S.A., Johnsen, T.V., Bustnes, J.O. & Jaspers, V.L.B. 2011. A first evaluation of the usefulness of feathers of nestling predatory birds for non-destructive biomonitoring of persistent organic pollutants. *Environment International* 37: 622-630.

Bustnes, J. O., Yoccoz, N., Herzke, D., Ahrens, L., Bangjord, G. & Skaare, J. U. Impacts of climate and feeding condition on the accumulation of organic pollutants in a terrestrial raptor. *Environmental Science and Technology* 45:7542-7547.

Ahrens, L., Huber, S., Herzke, D., Bustnes, J.O., Bangjord, G. & Ebinghaus, R. 2011. Temporal trends of polyfluoroalkyl compounds in tawny owl (*Strix aluco*) eggs from Norway, 1986–2009. *Environmental Science and Technology* 45: 8090-8097.

Sonne, C., Bustnes, J.O., Herzke, D., Jaspers, V., Covaci, A., Halley, D., Minagawa, M., Moum, T., Eulaers, I., Ims, R.A., Hanssen, S.A., Erikstad, K.E., Johnsen, T.V., Shnug, L. & Jensen, A.L. Submitted. Blood plasma clinical-chemical parameters as biomarker endpoints for organohalogen contaminant exposure in Norwegian raptor nestlings. *Environmental Research*.

Eulaers, I., Covaci, A., Herzke, D., Eens, M., Halley, D., Minagawa, M., Johnsen, T., Bustnes, J.O. & Jaspers, V.L.B. Ms. Usefulness of nestling predatory bird feathers as a non-destructive biomonitoring tool for assessing exposure to persistent organohalogenated pollutants: Part 2. Stable isotope analysis to elucidate the influence of diet and trophic level on exposure to POPs.

Communicated Results

Results have been presented in different conferences; e.g. the Dioxin conferences in 2009, 2010 and 2011.

Interdisciplinary Cooperation

Ecology, chemistry

Budget in accordance to results

It has been essential for continuing the research on raptors, which is especially important for the continuity of the multi-stress perspective.

Could results from the project be subject for any commercial utilization

No

If Yes

Conclusions

The project is the first to measure OCs, brominated flame retardants and PFCs in raptor chick blood and feathers (adults and young) in northern Norway. The future perspective of this project will be to understand the long-term dynamics of POP impacts in sea eagles.

A promising new technique developed in this project is the use of raptor feathers to monitor POPs in populations.