

# Impacts of the Fukushima Daiichi NPP accident on the Non-Human Biota: Challenges to the Environmental Protection System

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Summary of key points from presentations

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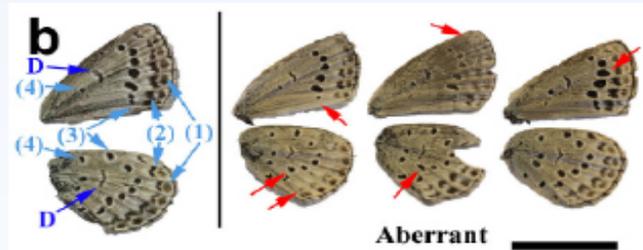
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ICRP Committee 5

*This presentation has neither been approved nor endorsed by the Main Commission of ICRP*

## Post-March 11 reports

### Phenotypic modification in butterflies

*Hiyama et al, Sci. Rep. 2, 570;*  
*DOI:10.1038/srep00570 (2012)*



### Loss of leader shoot in Japanese fir trees

*Sci. Rep. 5, 13232; DOI: 10.1038/srep13232 (2015)*



### Population impact on barn swallows

*Scientific American Feb 2015*

### **The Swallows of Fukushima**

NUCLEAR FALLOUT  
We know surprisingly little about what low-dose radiation does to organisms and ecosystems. Four years after the disaster in Fukushima, scientists are beginning to get some answers

## Challenge (1) Effects

**We have to distinguish between the effects of radiation and those of other factors associated with the earthquake and tsunami, and some biological factors.**

To convince an effect is caused by radiation;

- **Proper comparison between “before” and “after”**
- **Dose response relationship**
- **Comparison between field observation and laboratory experimental work.**

## Challenge (2) Dosimetry

**The current dosimetry system assume uniform distribution of radioactivity in biota and stable level of radioactivity concentration surrounding the organisms.**

**After the Fukushima Daiichi NPP accident, there was a rapid increase in environmental radioactivity. The radioactivity level reached a peak in a relatively short period of time, and then gradually decreased**

# Dose rates, Okuma Town, June 2011

RAP	Dose-rate estimate	Lower end DCRL	Ratio of estimate to benchmark
	μGy/h		
Bee	18	400	0.04
Deer	71	4	17.8
Duck	21	4	5.3
Earthworm	46	400	0.11
Frog	18	40	0.45
Pine tree	17	4	4.3
Rat	46	4	11.5
Wildgrass	26	40	0.65

[UNSCEAR 2013. Vol I. Scientific Annex A]

# Emergency exposure situations

