

**From:** Fortin-Noreus, Jennifer  
**To:** [Haroldson, Mark](#)  
**Cc:** [Frank van Manen](#)  
**Subject:** RE: Monitoring duration  
**Date:** Monday, December 12, 2016 9:52:10 AM

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Thank you for the article. I had seen this in the polar bear monitoring plan as their basis for foreseeable future. Great minds think alike! Thanks guys! JF

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**From:** Haroldson, Mark [[mharoldson@usgs.gov](mailto:mharoldson@usgs.gov)]  
**Sent:** Wednesday, December 07, 2016 9:19 AM  
**To:** Fortin-Noreus, Jennifer  
**Cc:** Frank van Manen  
**Subject:** Fwd: Monitoring duration

Remember out thoughts on duration of monitoring based on generation time. See below.

*Biology Letters* Published 7 December 2016.DOI: 10.1098/rsbl.2016.0556

**Conservation status of polar bears (*Ursus maritimus*) in relation to projected sea-ice declines**

Eric V. Regehr, Kristin L. Laidre, H. Resit Akçakaya, Steven C. Amstrup, Todd C. Atwood, Nicholas J. Lunn, Martyn Obbard, Harry Stern, Gregory W. Thiemann, Øystein Wiig

**Abstract [open access]**

<http://rsbl.royalsocietypublishing.org/content/12/12/20160556>

Loss of Arctic sea ice owing to climate change is the primary threat to polar bears throughout their range. **We evaluated the potential response of polar bears to sea-ice declines by (i) calculating generation length (GL) for the species, which determines the timeframe for conservation assessments;** (ii) developing a standardized sea-ice metric representing important habitat; and (iii) using statistical models and computer simulation to project changes in the global population under three approaches relating polar bear abundance to sea ice. Mean GL was 11.5 years. Ice-covered days declined in all subpopulation areas during 1979–2014 (median ?1.26 days year<sup>-1</sup>). The estimated probabilities that reductions in the mean global population size of polar bears will be greater than 30%, 50% and 80% over three generations (35–41 years) were 0.71 (range 0.20–0.95), 0.07 (range 0–0.35) and less than 0.01 (range 0–0.02), respectively. According to IUCN Red List reduction thresholds, which provide a common measure of extinction risk across taxa, these results are consistent with listing the species as vulnerable. Our findings support the potential for large declines in polar bear numbers owing to sea-ice loss, and highlight near-term uncertainty in statistical projections as well as the **sensitivity of projections to different plausible assumptions.**

----- Forwarded message -----

**From:** Haroldson, Mark <[mharoldson@usgs.gov](mailto:mharoldson@usgs.gov)>  
**Date:** Thu, Sep 15, 2016 at 11:33 AM  
**Subject:** Re: Monitoring duration  
**To:** "van Manen, Frank" <[fvanmanen@usgs.gov](mailto:fvanmanen@usgs.gov)>

My suggested edits are attache.

On Thu, Sep 15, 2016 at 8:05 AM, van Manen, Frank <[fvanmanen@usgs.gov](mailto:fvanmanen@usgs.gov)> wrote:  
| Here's my first try at the justification

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