

From: [Shoemaker, Justin](#)
To: [Marjorie Nelson](#)
Subject: Fwd: Wolverine timeline
Date: Thursday, February 9, 2017 10:39:24 AM

FYI.

I'm available to discuss as needed.

Justin Shoemaker
Acting Branch Chief for Classification and Recovery
U.S. Fish and Wildlife Service, Region 6
1511 47th Avenue, Moline, IL 61265
Phone: 309-757-5800 ext. 214
Email: justin_shoemaker@fws.gov

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From: **Grizzle, Betty** <betty_grizzle@fws.gov>
Date: Thu, Feb 9, 2017 at 11:28 AM
Subject: Wolverine timeline
To: "Shoemaker, Justin" <justin_shoemaker@fws.gov>, "Bush, Jodi" <jodi_bush@fws.gov>

Justin and Jodi - I would like to propose that we request a delay to our tentatively agreed timeline for the wolverine listing determination. I realize the solicitors will need to discuss this with the plaintiffs and I intend to keep working under the assumption of the schedule that was sent out earlier this week. My reasoning is described below.

- 1) The court requested that we evaluate effects of climate change at the reproductive denning scale. As you know, the climate modeling is taking longer than expected (preliminary results were initially due in mid-December). My understanding is there have been unexpected difficulties in this effort. This is not surprising given the complexity of climate change modeling in general.
- 2) The information currently being collected as part of the multi-state survey effort will provide valuable "real-time" occurrence data on wolverines. I need this information to provide an accurate assessment of current conditions and the results would be valuable for developing a population viability assessment (i.e., future scenarios) and more time would be needed for that effort.
- 3) From discussions with John Guinotte, I understand that there is a genetic study being proposed and funded by the States for the hair collected at wolverine bait stations/camera traps. I need this information to better assess the request by the court to evaluate the loss of genetic diversity (court stated this was the result of small (effective) population size) in combination with threats of demographic stochasticity of the wolverine (the latter could be greatly informed by a PVA). This information will also help in evaluating the degree of genetic exchange with Canadian wolverine populations.
- 4) The court asked that we revisit our SPR analysis and we also need to re-evaluate the previous DPS determination. Results from the surveys and genetic studies is essential for preparing these new (and complex) analyses.
- 5) I am aware of two new studies, in preparation for publication, that will provide (a) additional information on snow persistence at wolverine dens (Magoun et al.) and (b) information on the diet and foraging of wolverines (including during denning season). (Yates and Copeland). Copeland is also preparing a book chapter on wolverine behavior. We have

received early copies of two of these, but they are still drafts and have not undergone peer review. These accounts are from some of the top wolverine species experts.

In sum, we need to have the best information available in order to prepare a solid listing determination. I would like to talk more about this with John, Steve, and others while we are in Denver next week to see whether an appropriate revision to the schedule can be proposed. As I said, I will continue to work under the currently proposed internal timeline.

Betty

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Betty J. Grizzle, D.Env.
Fish and Wildlife Biologist
U.S. Fish and Wildlife Service
Carlsbad Fish and Wildlife Office
2177 Salk Ave, Suite 250
Carlsbad, CA 92008
760-431-9440, ext. 215
760-431-5901 fax