



Fitzgerald, Katherine <katherine_fitzgerald@fws.gov>

climate change and fishers

Roger A Powell <rpowell@ncsu.edu>

Fri, May 17, 2013 at 2:30 PM

Reply-To: newf@ncsu.edu

To: "Fitzgerald, Katherine" <katherine_fitzgerald@fws.gov>

Dear Ms Fitzgerald,

Thank you for your e-mail. My observations will be considered anecdotal yet they are consistent and make sense to me.

In the mid-1970s I had several wild fishers in captivity in Upper Peninsula Michigan. In an opening in the forest behind a district ranger station on the Ottawa National Forest, I had a 20'x40' pen with 6 elevated 3'x4'x6' cages, each with a nest box. Guillotine doors restricted access to the pen to 1 fisher at a time. During summers, I noted that fishers were inactive on hot days and went through copious amounts of water. Keeping the fishers supplied with water became difficult and required several visits a day to keep 1 gallon water buckets full. The fishers panted whenever the temperature got much above 20 C, or about 70 F.

During the same period, I had 2 fishers (1 M, 1F) that I had hand-raised so that I could handle them. I early April 1975, I took them to Dick Taylor's lab at the Concord Field Station of Harvard University, where Dick collected metabolic data on all sorts of animals. I had trained my 2 fishers to run on a treadmill so that I would be able to collect metabolic data at different running speeds while at Dick's lab. My fishers were housed in outside runs but all the treadmills and metabolic equipment were inside. The first time I tried to get my male fisher to run inside, he overheated and I had to quit the session within minutes. I tried a couple more times but standard indoor temperatures always caused overheating. Dick allowed me to take over a small environmental room that I could adjust to below freezing temperature and my fishers ran just fine in that room. Although moving the fishers into the small environmental room changed more than just temperature, temperature was the major difference. I am certain that temperature was the critical difference.

From a different line of reasoning, the dogma among field researchers is that during summer fishers are difficult (to impossible) to trap or to document using non-invasive methods. Keith Slauson has data on the effect. During summer 2009 my students live-trapped fishers and had an average capture rate. They trapped north of the Klamath River south of Mt Ashland in northern California. They placed traps in cool microhabitats in heavily shaded forests along creeks on north-facing slopes where possible. So, despite daily temperatures often well above 20 C in open areas and in open forests, fishers were active where temperatures were cool and where they were protected from radiant heat gain.

Feel free to cite me as "personal communication". I have published my metabolic work with fishers and my publications mention that the fishers were run in an environmental room with temperature set below freezing (Powell 1979 Journal of Animal Ecology).

Get back to me if you have questions.

peace , , , ,

roger

On 17-May-13 15:22, Fitzgerald, Katherine wrote:

Hi Dr. Powell,

I'm working with Scott Yaeger on the west coast fisher listing assessment-- I've been tasked with

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writing up a section on potential effects of climate change.

Most of what I've seen in the literature deals with climate change effects to fishers mediated through changes in their habitat. That's straightforward enough, aside from the uncertainty associated with all the layers of models.

I'm also interested in potential direct effects due to physiological stress from warmer summer temperatures. I don't think anything has been published on this, but I've run into the idea from a few different folks (and it makes sense). I've been in touch with your student Aaron Facka, who I know is looking at hypotheses about fishers and heat stress. He mentioned that you have some observations of heat-stressed fishers.

Would you be willing to share those observations with me? Or any other observations or hypotheses you have on the topic? And if so, would it be OK for me to cite what you say as a personal communication?

Thanks very much,
Katherine Fitzgerald

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Katherine Fitzgerald
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U.S. Fish and Wildlife Service
Yreka Fish and Wildlife Office
(530) 842-5763 ext 111

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

From: (b) (6) P.I.I.
Date: Fri, May 17, 2013 at 12:51 PM
Subject: RE: climate change and fishers
To: "Fitzgerald, Katherine" <katherine_fitzgerald@fws.gov>

Hey Katherine,

I think the reason that Scott suggested me, well maybe not only me, is that I've been one of the major advocates of the "too warm" hypothesis. Unfortunately, no one has formally put it down as a hypothesis or tested it. That is good for me, because its actually part of my dissertation (well I hope it is). I'm actually in the beginning stages of trying test the hypothesis with our data from Stirling.

So, I think generally, you have the hypothesis correct. Summer temperatures probably do pose a difficulty for fishers that likely affects their habitat choices and fitness (just my opinion at this point). It also important to note that is not just high temperatures that I hypothesize are important. Direct solar radiation, sunlight, probably also has a negative effect on fishers. These two factors are likely why fishers are reliant on high overhead canopy, tall trees (large DBH as a correlate), sometimes layers, and why those restrictions are slightly reduced as you move north.

I'd be happy to help you out with more aspects of this, very important, hypothesis (question). Also, Roger Powell, my advisor has some good personal observations of fishers running in warm temperatures and having become heat stressed. Really, the evidence for fishers and problems (not really problems – relatively low upper boundary on their thermo-neutral zone) has been there for a while, but no one has either put it all together or they just haven't worked on it.

Let me know what else I can help you with.

Aaron

From: Fitzgerald, Katherine [mailto:katherine_fitzgerald@fws.gov]

Sent: Friday, May 17, 2013 3:14 PM

To: Aaron Facka; Scott Yaeger

Subject: climate change and fishers

Hi Aaron,

I'm drafting up a climate change effects section for the fisher listing evaluation. Scott suggested that you might have some helpful input.

What I'm finding in the literature indicates that there will likely be climate change effects to fishers mediated through changes in their habitat. No problem with that (other than the uncertainty associated with feeding a modeled climate projection into a vegetation model).

There also seems to be a hypothesis floating around -- but not published anywhere that I've seen -- that too-warm temperatures may be a physiological stressor to fishers. If so there could also be direct (negative) effects of warmer summer temperatures. It's easy enough to find papers say that fishers select cool rest sites, but I haven't seen this hypothesis articulated anywhere.

Do you think that's a correct statement of a hypothesis that exists among fisher researchers? Do you know of anywhere a similar hypothesis might be written down in a form that could be cited?

Do you have any speculations you'd care to share? Anything that you would be willing to be cited as saying (in personal communication)?

Thanks!

Katherine

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Husk at leve
Mens du gør det.
Husk at elske
Mens du tør det.

Piet Hein