Timothy Carlson

Fisher populations in Albany and Pacific Northwest

Introduction:

Fishers(*Martes pennanti)(Feldhamer et al. 2003)* are small carnivorous mammals native to the northern United States and Southern Canada. They're old growth obligates that like to live in boreal forests and require large areas of land to survive(“Fisher - NYS Dept. of Environmental Conservation” 2016). They are in the family Mustelidae and are closely related to the American Marten, Minks and have three subspecies (Powell 1981). Once present in the entire Pacific Northwest(Aubry and Lewis 2003) the Fisher is extirpated from the area due to the fur trade and heavy logging of the conifer forests. Although there are still large areas of land in the Pacific Northwest that are still suitable for the Fisher, all reintroductions have been mostly unsuccessful. On the opposite side of the country where fishers have been extirpated from New York, there is still a population in Albany that is thriving even though it is not a suitable habitat. So why is it that fishers are thriving in Albany, while reintroductions are failing in the Pacific Northwest.

Ecology:

Fishers are sexually dimorphic mesocarnivores and belong to a monospecific genus with three subspecies. They are similar in size to a domesticated cat and can weigh anywhere between 2 to 6 kg depending on sex. They are dark brown in color and appear almost completely black in the winter(“Fisher - NYS Dept. of Environmental Conservation” 2016). They can have a gold to silver face and may have patches of white fur on their underbelly. Although solitary animals they make very good generalist omnivores mainly hunting snowshoe hares, and they have also been known to kill larger prey such as bobcats and Canada lynx (Powell 1981). When fishers can't find catch food they will eat berries, insects, mushrooms, and nuts. Fishers are also one of the only animals that hunt porcupines. They use their agility to circle the porcupine and

avoid its tail and wait for an opening to either attack its unkilled face or rush underneath and flip it over(“A Fisher’s Guide To Preying On Porcupines” 2019).

Historically they lived in a strip of boreal and mixed old-growth forest between the US and Canada and went halfway down the west coast and in the east reaching as far south as Kentucky. Even though fishers are considered arboreal animals and are very good at climbing trees they spend most of their time on the ground where they hunt (Feldhamer et al. 2003).

Female fishers can reproduce after about 1 year of age and mating takes place in the spring. The female then delays the pregnancy for 10 months until mid-February and then gives birth about 50 days later(Powell 1981).

Fishers in Albany:

Fishers are old-growth obligates and require large areas of untouched old-growth forest to survive(Powell 1981). But a small population of them is thriving in Albany, New York. Once present in all of New York the Fishers range has been devastated due to urbanization and habitat destruction. In Albany, fishers have adapted to life in a city. Fishers that live in Albany display many behavioral differences compared to those that live in rural areas (LaPoint 2013). Tracking devices were placed on fishers that lived inside and outside of Albany. Their movements and behavior were all logged and it showed that fishers that live in Albany have changed their active hours to avoid peak human traffic throughout the day. They've also been taking advantage of natural and man-made city corridors such as streets to cover large areas of land just like they require in the wild(LaPoint 2013).

Another large contributor to the success of the Fisher in Albany is that they haven't been there for very long. Their typical prey such as squirrels and rabbits may have forgotten that the Fisher is a threat which leads to food being incredibly easy for the Fisher to catch allowing for them to thrive. If this is the reason behind their success the Fisher population may collapse once their food becomes harder to get either by overhunting or the prey learn that the Fisher is a threat(Lewis 2022).

Fisher habit has increased by 57% overall but in the East, it has increased by 119% although this does not cover their entire historic range(“Tree-climbing carnivores

called fishers are back in Washington's forests" 2022). These "new" areas that they are expanding back into have completely changed since the last time fishers were present and they found that eastern fisher populations experienced a 34% reduction in their predator overlap. The wolverine and cougar are no longer present in New York so two of their predators had completely been eliminated. This helps explain why fishers are thriving in Albany as less predators lead to decreased predation resulting in fewer fishers being hunted and with the complete elimination of Lynx and Cougar fisher populations can continue to expand by this principle.

Fishers in the Pacific Northwest:

Once expanding down to California and up to Alaska the fisher's range in the west was very large, however they now only occupy select areas in California and North of Vancouver("Olympic Fisher Reintroduction Project 2008-2011" 2011.). Although their expansion in the east has been very promising their expansion in the west has been a lot much more difficult. In 2008, 100 fishers were reintroduced over a 3-year period, and by the end, half were dead and the other half had an unknown status. There is more success in a 2014 reintroduction in which some of the fishers released did reestablish breeding populations but it is nowhere near the historic populations("Olympic Fisher Reintroduction Project:2008-2011" 2011).

The fishers that live in the west seem to have more problems than the fishers in the east and this is greatly affecting their reintroductions. Not only do they have to deal with the problems faced by eastern Fishers, such as habitat destruction and hunting, but the Western fishers also need to deal with wildfires and unregulated American Marten growth. Unlike in Albany the West Coast fishers remain old growth obligations and require large areas of land to survive. This causes logging to be a large problem for Fisher habitats as they won't live in any area that has less than 50% cover, clear cutting and cutting out large trees not only destroys the ecosystem but makes them uninhabitable even for surviving Fishers. The same thing happens when forest fires in the west occur. These fires can destroy the entire ecosystem if they are large enough and because of global warming, they are only becoming more frequent and destructive.

American martens are small to medium mustelids and are related to the Fisher. They also live in the Pacific Northwest and may be out-competing the local Fishers, limiting the expansion of the Fisher's range. Normally Fishers outcompete the Marten but in the Pacific Northwest, this is the opposite. When the Fishers were extirpated the American Marten's niche may have expanded into a larger area compressing the niche size (Manlick et al. 2017) of the Fisher making it harder for them to re-expand into their historical range. Combined with the continuous destruction of their habitat, the range has only increased about 15-18% from its current range, getting nowhere close to its historic range (Kautz et al. 2021).

Although it does affect Fisher populations as much as deforestation and wildfires, parasites are infecting fishers making survival much more difficult for the already struggling populations. Most parasites aren't a problem for Fishers but Nematodes have been found in up to 35% of Fishers (Clowater 1990). They can also be found in martens, minks, and weasels: all animals that they have close contact with. The highest infection rate in Fishers is by *Mesocestoides variabilis*(Clowater 1990), a species of tapeworm. This parasite can be carried by coyotes, bobcats, skunks, raccoons, and mice and it is spread through ingestion of the host causing intestinal blockage, toxic reactions, and malnutrition.

Some populations have been found to have up to a 50% infection rate of these tapeworms(Clowater 1990). While the parasites don't kill the host they weaken it substantially and make it much easier for the fisher to be killed, either by environmental or predator-prey interactions. For reintroduction to be more successful the Canadian and US governments must make more effective legislation to help prevent the major factors affecting Fishers on both sides of the border.

Interview with Dr. Jeffrey Lewis:

Dr. Jeffery Lewis is an ESF alumnus that got his Ph.D. at The University of Washington. He is a Mesocarnivore Conservation Biologist at the Washington Department of Fish & Wildlife and he has done a lot of research into the reintroduction of fishers and why they are struggling in the Pacific Northwest. When interviewed about the reintroduction efforts in December of 2022 he said "...there were regulations, some

regulations put in place, it just wasn't enough". Additionally, he talked about the regulations and how they helped but weren't effective enough with people still finding ways to harm them. Even though hunting and trapping fishers is illegal in the US there are still "...trappers out there trapping for other critters and catching fishers". These trappers may have caught them by accident but people are still poaching them because they are "...still valuable and they can sell them in some other state or country".

Fisher trapping was made illegal in the 1930s after their populations were driven down by intense Hunting and deforestation. This helped with the trapping aspect but deforestation is still a problem and "you're losing habitat and low-elevation forests because humans are in developing those areas".

Dr Lewis then went into a more obscure threat that fishers face and its poisonings "you've got people poisoning wolves and bears and cougars and coyotes and mountain lions by poisoning baits and fishers are getting into those things". Fishers in the Pacific Northwest face a lot of problems and are going to require multiple layers of protection to not only protect them directly, such as banning Fisher trapping, but also need to implement protection that indirectly protects them. Elimination of markets within states will help with poaching but poisonings are still very much a threat. Legislation that makes poisons more restrictive will also help reduce the amount of accidental fisher loss. Dr. Lewis commented on all these risks saying "...so you've got a buttload of old continuing new ongoing risks, threats, challenges" (Lewis 2022).

Conclusions, and how to fix the problems:

Fishers once had an extremely vast range and even though they are recovering there is still a lot of work to be done. Wildfires, deforestation and Martens all affect the populations in the Pacific Northwest and are the major reasons for their majorly unsuccessful reintroductions. Joint legislation between the US and Canada could help standardize protections on both sides so any fishers crossing the border have the same protections.

Trapping of fishers is still Legal in British Columbia and many people still trap them because they are valuable. In the US fisher trapping has been illegal since the 1930s. This is useful in the US but fishers travel large areas of land. They could easily

cross the border and get trapped where it's still legal. British Colombia has notoriously bad logging regulations and companies are going in and clearcutting, and clearcutting with reserves. Fishers won't live in any forest that has less than 50% canopy cover so even though there are still trees the areas are completely uninhabitable. More effective logging regulation has been introduced such as the Net-Zero bill which aims to decrease carbon produced from logging by 33%. Although this is helpful, only 15% of British Columbia is protected(“Land Designations - Environmental Reporting BC” 2016.). Strict logging and Laws would greatly benefit the fisher.

The population in Albany adapted to its changing environment and has become much more comfortable around human activity and knows how to actively avoid them (“Your new neighbors, the fishers” 2009). The prey availability, and ease to catch all help benefit the population but may not be sustainable for long term inhabitation. The behavior changes in them suggests that they can be more than just old growth obligations and adapt to these new surroundings. The Fishers in the Pacific Northwest don’t show these behaviors and it could be because they still have semi-habitable old growth forests which have kept them from being forced to adapt to city life. Additionally, prey don't display the same naivety in British Columbia as they do in Albany and food may be more difficult for Fishers to capture, inhibiting their population growth.

Literature Cited

A Fisher's Guide To Preying On Porcupines. 2019, September 8. . https://www.mtpr.org/arts-culture/2019-09-08/a-fishers-guide-to-preying-on-porcupines.

Aubry, K. B., and J. C. Lewis. 2003. Extirpation and reintroduction of fishers (Martes pennanti) in Oregon: implications for their conservation in the Pacific states. Biological Conservation 114:79–90.

Feldhamer, G. A., B. C. Thompson, and J. A. Chapman. 2003. Wild Mammals of North America: Biology, Management, and Conservation. JHU Press.

Fisher - NYS Dept. of Environmental Conservation. (n.d.). . https://www.dec.ny.gov/animals/9357.html.

Kautz, T. M., D. E. Beyer, Z. Farley, N. L. Fowler, K. F. Kellner, A. L. Lutto, T. R. Petroelje, and J. L. Belant. 2021. American martens use vigilance and short-term avoidance to navigate a landscape of fear from fishers at artificial scavenging sites. Scientific Reports 11:12146.

Land Designations - Environmental Reporting BC. (n.d.). . Province of British Columbia. https://www.env.gov.bc.ca/soe/indicators/land/land-designations.html.

LaPoint, S. D. (n.d.). Movement ecology of fishers (Pekania pennanti) within a semi-urban landscape:163.

Lewis, Jeffery. 2022 Interview on Fishers with Danny https://www.youtube.com/watch?v=rDTRL8ZXpJE&t=1339s

Manlick, P. J., J. E. Woodford, B. Zuckerberg, and J. N. Pauli. 2017. Niche compression intensifies competition between reintroduced American martens (Martes americana) and fishers (Pekania pennanti). Journal of Mammalogy 98:690–702.

Merrill, A. 2021, July 20. Fishers of the Pacific Northwest. https://animalsofpnw.com/2021/07/20/fishers-of-the-pacific-northwest/.

Olympic Fisher Reintroduction Project: Progress Report 2008-2011. (n.d.). .

Powell, R. A. 1981. Martes pennanti. Mammalian Species:1–6.

Tree-climbing carnivores called fishers are back in Washington's forests. 2022, October 7. .

Your new neighbors, the fishers. (n.d.). . http://alloveralbany.com/archive/2009/02/13/your-new-neighbors-the-fishers.