Canada Lynx Species Status Assessment Addendum - Peer Review Comments				
Page	**Chapter**	**Line #**	**Comment**	**Peer Reviewer**
6		114	Even though it is an exec summ. seems like there should be a citation for the model reference	Andrea Lyons
5		103-105	I find the statement in the Executive Summary (and similar statements elsewhere in the document) "...we developed three plausible scenarios that capture the range of factors that may influence lynx populations in the future" to be misleading as the projections only explicitly considered climate change. Yes, the SSPs consider e.g., land use but only in its effect on emissions. The actual direct effect of land use on lynx habitat was not considered in the addendum analysis and wording regarding what factors were actually modeled should be made very clear.	Erin M Simons-Legaard
13		293	Thank you for including the Kettles.	Andrea Lyons
15		380	One important new issue is the large increase in funding under the Infrastructure Bill on federal lands to reduce fire risk over the next 10 years. I believe these actions will be over lands in excess of <10-12 million acres. The degree these impacts to habitat quality depend on location. Lynx habitat patches are small, even in the Northern Rockies. Therefore, large scale forest modification (thinning, controlled burning, harvest) could have strong impacts depending on implementation. Many of the proposed treatment actions would reduce the horizontal cover required by lynx and snowshoe hares.	Squires, John - FS, MT
14		355	Our paper (Lyons et al. 2023) provides some evidence to support this	Andrea Lyons
15		375	Many of these in WA are quite old and need to be updated.	Andrea Lyons
17		436	It is true the primary covariates in Olson et al could be proxies for snow conditions. It's also true that these same covariates could be proxies for cool, moist spruce-fir forests that support hares. I suggest you clarify that uncertainty.	Squires, John - FS, MT
32		966	This section describes in detail how MFWP is managing trapping , but fails to mention the increase in use of snares to kill wolves. I realize that snare use in lynx occupied habitat is limited, but there are efforts to remove that restriction in areas surrounding the GYA.	Squires, John - FS, MT
35	1	1098	In the Minneapolis meeting, there was concern that deciduous tree invasion in lynx habitat was a major issue, but not mentioned here. I'm not sure the timeframe or scale of this concern in the climate context.	Squires, John - FS, MT

38		1205-1222	It is mentioned briefly in the 2017 SSA, and I think bears repeating here (or later under Habitat Loss) that if outbreak conditions occur in Maine, landowner response (particularly pre/salvage of high value regenerating stands of spruce-fir forest) would result in habitat loss for hare and lynx. There is currently a lot of just barely merchantable wood in this type that is still providing hare habitat that if there was a strong salvage response would represent a substantial effect on current habitat.	Erin M Simons-Legaard
36		1158	At what scale? Occupancy is high in the Okanogan winter and summer, and across years. Micro-site occupancy??	Squires, John - FS, MT
34		1028	The increased fire activity in the Okanogan LMZ suggests the land managers need to think about different approaches - see Lyons et al. 2023.	Andrea Lyons
38	4	1233	Similar to the above comment, including an acknowledgement of recent work out of the fire ecology field by Hessburg and Prichard would make this a more rounded paragraph. Their work shows that without intentional forest management, we could stand to lose more lynx habitat to fire than to the fuels treatments themselves. This indicates that the LACK of landscape level vegetation management on the Oka-Wen could pose a risk to this population.	carmen vanbianchi
40	4.4	1298	Small correction, while I worked for the USFS and helped with the collaring effort, I, nor ay of the authors, led this effort. Instead the USFS should be credited here.	carmen vanbianchi
34		1040	Totally agree with the general summary but it's interesting that several of the different populations are showing up outside of expected range, including to the south. That would make for a good research question	Andrea Lyons
36		1126	is this increased precip falling as rain or snow? The type would influence lynx habitat and lynx/hare use	Andrea Lyons
40	4.4	1322	Agreed! As per my above comments, I think this is a key point. As urgent as northern migration of lynx habitat is, wildfires are an even more immediate that and can increase the conversion of boreal forest types since the lag they might otherwise experience behind temperature increases may sync after an area burns. That is to say, a forest stand that doesn't burn may remain unchanged long after the temperature increases, but if it burns, it may speed the process since it will regenerate according to the current climate conditions. In addition, fires burning and especially reburning at high severity (as predicted under climate change) can convert to more open forest types. Large, high severity wildfires pose a risk to lynx not only as a temporary loss of habitat, but because they can accelerate forest conversion under climate change, perhaps permanently altering areas to non-habitat.	carmen vanbianchi

38		1231	You state that you are unaware of deviations from forest management plans. We don't know the impact but we do know there is now extensive federal funding ($4.5 billion) from the Infrastructure Bill to alter forest structure in ways that reduce fire risk across millions of acres of land. This is a major change in forest silviculture with activities that will reduce vegetation density and presumably hare density with potential impacts to lynx. The impact of this massive change in forest management depends on where it is implemented - it could have no impact to lynx depending on location. Regardless, it seems important to mention that the implementation of this work could be important to lynx management.	Squires, John - FS, MT
43		1459	Change "2918" to "2018"	Erin M Simons-Legaard
38		1233	It seems a lack of vegetation management/restoration is contributing to much larger wildfires and subsequent habitat loss	Andrea Lyons
40		1317	Not exactly infrequent anymore	Andrea Lyons
47		1561-1567	The characterization of a critical habitat area representing a minimum habitat amount is somewhat misleading. Speaking for Maine, there is a lot of nonforest included in the critical habitat area, which should not be counted as having the features necessary to support lynx. The sq km of the critical habitat area represents a maximum habitat area within that area.	Erin M Simons-Legaard
40		1322	forestry resiliency?	Andrea Lyons
58		1844	missing word at the end of the sentence	Squires, John - FS, MT
46		1537	Add explanation to caption that core range refers to Canada	Andrea Lyons
36		1148 - 115	This statement is true for any lynx habitat in the continental US - not just Yellowstone. Therefore the statement should be over-arching across populations or deleted.	Squires, John - FS, MT
37		1165-1173	Good summary	Squires, John - FS, MT
53		1686	This is a really interesting statement, especially given some of the southward lynx movements	Andrea Lyons
40		1325 - 134	It is true that fire impacts can be good, neutral, or bad depending on timing and scale. However, this narrative does not capture the current fire science literature concerning disturbance. We are not in "normal" times for fire behavior and management. Climate change has altered fire disturbance outside the range of natural variability (>1000 yr time frames). Spruce-fir forests that lynx / hares require are especially at risk. We are in completely different times in terms of fire frequency and severity to the point that some forested landscapes in the subalpine zone will not recover to forests at all - forest to meadow. This current narrative doesn't capture the urgency of the fire issue with climate change.	Squires, John - FS, MT

49		1609 - 161	No, the GYA and Colorado do not have similar historical evidence of persistent populations. The GYA records extends from the 1920 or earlier to 2010 with reproduction and without augmentation from lynx transplants. Trappers harvest approximately 17 lynx from the Wyoming Range in the late 1970's in one winter.	Squires, John - FS, MT
58		1844	incomplete sentence	Andrea Lyons
53		1711 - 171	The statement concerning the GYA is incorrect. We do not know the long-term residence of lynx in the GYA. Some evidence suggest that they were resident for the long-term (1920s). It's true that lynx are currently "functionally extirpated" in the GYA which is an important issue to stress throughout the document.	Squires, John - FS, MT
56		1793 - 180	As I mentioned in the initial summary, I question using a single variable to model climate change impacts to lynx habitat I agree that MCMT is a predictive variable and generally applicable across populations. That said, MCMT is ranked 6th in predictive ability in our most recent distribution models for the Southern Rockies in Colorado (analysis completed after the SSA consultation). Regardless, I don't understand why separate multivariate models were not calculated for reach region so that data and model results could identify best regional models to extrapolate across climate scenarios.	Squires, John - FS, MT
62		1891 - 189	We do not know if this sentence is true or not. Northern Rockies could have over 700 lynx - we don't know.	Squires, John - FS, MT
63		1924 - 192	There is high uncertainty about the depth and retention of snow with climate change in the complex mountain terrain of the western US. We do not know if legacy spruce-fir forests with reduced snow depths, but still persistent snow cover may offer some buffer to lynx from generalist carnivores during winter. This sentence needs a more nuanced explanation.	Squires, John - FS, MT
62		1902	Seems like you could also argue that if we want to keep lynx on the landscape then it makes sense to put them where habitat conditions/model variables have highest potential	Andrea Lyons
46		1546-1551	How did you come up with these breaks?	Andrea Lyons
49		1597-1618	This paragraph makes me wonder if adding a score for connectivity between units would be useful?	Andrea Lyons
72		2091 - 209	There is no acknowledgement of any uncertainty regarding forest retention and snow/hare/lynx relationships over time with climate change. The implication of this statement suggests that agencies should walk away from the species' long-term management and conservation at their southern range periphery given the very difficult forecast.	Squires, John - FS, MT
15		402	Text mistakenly refers to "Table 1" instead of Table 3.	Erin M Simons-Legaard

73		2095 - 209	Given the length of the amendment, many people will only read – Chaper 7:Synthesis. Therefore, the lead sentence to this section is important. It reads, "There are currently more resident lynx populations and individuals in the contiguous U. S. than was known or suspected at the time the DPS was listed in 2000 and, in some places more lynx than likely occurred historically under natural patterns of forest disturbance and lynx dispersal." I don't understand the point of this lead sentence and it is misleading. In 2000, there was no estimate of lynx population numbers in the contiguous US. In fact, it was not know how many populations were present in the contiguous U.S. Other statements in the sentence may be supported but only with very selective science interpretation. More important is the current gestalt of issues that confront lynx in the contiguous US? Lynx populations depend on spruce-fir forests that are impacted by disturbance processes outside any long-term range of natural variability. I understand that lynx use recent fires – we just completed a 4 yr study of that specific issue in the Northern Rockies; we're currently reporting these results. But we also understand that it takes between 20-50 yrs or more for these sites to recover for lynx general use depending on management actions and site conditions. We know that lynx in Colorado are highly vulnerable to stochastic hare fluctuations because red squirrel populations are sharply reduced across western portions of the state due to broad-scale insect outbreaks that altered forest structure and composition. Although we do not know how consistent the GYA was occupied by lynx through time, there is some evidence of occupancy as early as the 1920s and there was more broad-scale occupancy in 1997 it appears. The GYA population is now extirpated we believe, which is significant. There is evidence that lynx populations in Washington and Minnesota consist of few individuals (possibly <100 each). As such, they are vulnerable to environmental fluctuations. I suggest you modify the lead sentence to this important section so it accurately portrays the situation that lynx confront at their southern range periphery.	Squires, John - FS, MT
75		2174 (2164	Regardless of Deb et al, much is not known regarding how northern lynx will respond to the accelerated patterns of extreme climate change experienced at high northern latitudes. Will hare cyclicity remain with climate change or will it fall apart as with some other mammals? How would that impact lynx population dynamics? Will reduction in snow packs alter interspecific relationships. or hare predation rates?	Squires, John - FS, MT

19		491-493	I'm unclear how there can be a downward trajectory of lynx habitat on one hand, and also a stable "high-quality " lynx habitat from 2003 -2019. Please clarify. Also, in the original SSA meeting in Minneapolis, researchers from Maine were concerned that changes in land ownership would impact the trajectory of lynx habitat. Also, there was concern that deciduous forests moving north was an issue (red maple I think). Finally, the role that herbicide application played in the distribution of Maine's conifer forest that support lynx is unclear. It would be helpful to clarify how these trends are projected to impact lynx habitat in Maine going forward.	Squires, John - FS, MT
21		535-538	yes, it's true that lynx have increased in Minnesota, but not that much based on these estimates - 47 individuals in 2004 to 90 individuals over 18 years. This population is still small but I'm unclear how much of the state's lynx habitat is included in the Superior Nat. Forest.	Squires, John - FS, MT
21		542-552 an	You discuss in detail the Hostetter et al 2020 paper. Please include in that discussion why there appears to be such a sharp reduction in high probability occupancy (Figure 7 - purple color) from 2014-15 compared to the other time periods - unclear to me why that was the case.	Squires, John - FS, MT
23		582-591	It seemed to me the narrative regarding lynx in the Garnet Range is dismissive. I believe that I said in 2016 there were 7-10 individuals; I don't know how many lynx occupied the Garnet Range but there were more than 2. Lynx in the Garnet Range produced kittens each year - usually a couple of dens but kitten survivorship was low. The oldest lynx that we have ever document lived in the garnet range (16 years) and this was the only lynx population that typically denned in small caves and under boulders. We documented our largest litter in Montana (6 kittens) in the Garnets, and the population is genetically distinct from Seeley. The population failed following broad-scale forest thinning and from loss of habitat due to a large fire east of Elevation Mountain. It is significant that this small population was extirpated.	Squires, John - FS, MT
24		621-622	We do lack data regarding the number of lynx in Montana, but this population does represent the largest in the West. The narrative so far seems to downplay the importance of this region.	Squires, John - FS, MT
24		641-644	In Montana, most productive lynx had at most approximately 40% or so advanced regen (20-40 yr forests). In addition, the proclivity of females to produce kittens was related to mature forests with approx. 20% of tree > 100 ys old. So what is the basis to say this is "good to excellent" habitat. This might be true for the drier habitat types in Washington (the "Meadows", but what is the basis for this statement?	Squires, John - FS, MT

25	3	675	Anecdotally, based on the data being collected by the first three collars deployed on lynx trapped within the Tripod Burn and the observation of lynx tracks over our two month field season this past winter of 2023, there are already lynx living within the Tripod Burn. This is remarkable given the results of King et al.'s work which just 6 years ago, found little sign of lynx. If lynx are returning to some burns in the North Cascades at 17 -years post fire, this could speed up the recovery time predicted by King et al. It will take time to determine what burn-scar qualities lend themselves to recolonizing lynx sooner or later and at what level of quality, but I am heartened at least by our initial observations that burned areas may be more suitable to lynx sooner than expected.	carmen vanbianchi
25		662-673	I don't understand the value of this speculation concerning minimum population density. We don't know how many lynx are in Washington.	Squires, John - FS, MT
29	4	844	I worry that the guidelines outlined in the LCAS, both the former versions and the newest revision, do not apply well to the Oka-Wen's fire transformed landscape. In the case of the original LCAS, I worry these guidelines are now limited in value since they were based on lynx habitat selection at a time when the habitats available to lynx were mostly unburned. The landscape available for lynx to select from now is greatly changed by fire and we are only just beginning to learn how their habitat selection may have shifted according to these new availabilities. Similarly, the new Spatial Framework for Conservation leans heavily on the recent work from Montana, which is wonderful work but again, I worry does not apply well to the fire transformed landscapes of the North Cascades. Managing for mature forest could be counter to the foremost threat to Wa lynx, wildfires.	carmen vanbianchi
25		694 - 695	We do not know the persistence of the GPA population through time. We know from photos that government trappers harvested lynx in Yellowstone Nat Park in the 1920's. We do not know if lynx remained until the 2010 or not. The lynx population in Minnesota winked out as documented by Mech, but it is considered "persistent" Clearly, GYA is much lower quality and farther from northern-source populations in comparison, but the statement is unsupported and unknown.	Squires, John - FS, MT
30		879 - 882	The most important lynx habitat owned by the BLM in Colorado is near the San Juan Nat Forest I believe (Silverton, CO area)	Squires, John - FS, MT
30		882-885	Yes, lynx were managed under these guidelines and the population failed possibly from extensive forest thinning and natural wildfire	Squires, John - FS, MT

31	4	909	See above note. I think this discussion could be made stronger by touching on Washington's shifted conditions and that reducing the risk of catastrophic habitat loss to wildfires may be better served by informed, intentional, and strategic fuels reduction. This versus business as usual or managing for increased mature forests.	carmen vanbianchi
31		903-908	The WLBT does represent a thoughtful approach to lynx management. However, it should be mentioned that implementation of the plan depends on it being adopted by the Lynx Steering Committee and Regional Foresters and that is still uncertain.	Squires, John - FS, MT
70		Table 12	This implies that there could be no active population rescue like assisted migration. In Europe, Eurasian and Iberian lynx transplantation is central to the management of these species. I realize this scenario is unlikely in Colorado and Wyoming given the current situation. However, we don't know what will be considered appropriate as boreal ecosystems and associated species contract and decline with continued climate impacts.	Squires, John - FS, MT
47		Table 5	I see the need to estimate a population value but we truly do not know the minimum number of lynx in Northern Rockies. For example, this winter we trapped 14 lynx in 2 small fire-impacted areas. The 200-300 population estimate for the Northern Rockies could be off substantially. There needs to be a better way to communicate the uncertainty in the narrative.	Squires, John - FS, MT
17			Lynx habitat selection is complex. Therefore, it seems simplistic to use a single covariate (MCMT) across all populations. It is likely that snow and winter temp characteristics differ substantially across the DPSs. For example, MCMT isn't the top modeling covariate for the southern Rockies based on some very recent distribution modeling. Why weren't multivariate regional climate model tested across climate scenarios? (see comment - page 56	Squires, John - FS, MT
		168	Table 1 I would put the locations as abbreviations. Maybe start this on line 108 figure. MW = Midwest, etc.	Moen, Ron
		344	statuses	Moen, Ron
		359	There is an element of competitive advantage, but it also seems that it isn’t so much competition per se, instead it is snow conditions that result in exclusion of potential competitors.	Moen, Ron
		363++	It seems that the Iberian lynx is an exception to this. I would consider including some reference to Iberian lynx, and indicate that primary issue may be competition from other species that cannot handle deep snow (bobcat, coyote). In other words, they have the adaptive capacity, but competition from other species would prevent success.	Moen, Ron

	Table 3	402	Table 3, row 1: It seems like should mention other species in here—is it habitat / hare density alone, or those two in combination with presence of other competitors (bobcat, coyote).	Moen, Ron
			Table 3, row 4: Same theme as previous. It isn't that lynx outcompete as much as it is that other predators cannot persist in conditions that lynx can.	Moen, Ron
		406	use Under and Over instead of A and B	Moen, Ron
		440	Snowshoe hare	Moen, Ron
		456	It wouldn't be Lake Michigan. Lake Superior. I also wouldn't describe it as lake-effect snow (south shore of Lake Superior, Buffalo by Lake Erie) as much as it is lake effect on weather patterns. Living here, we see Lake Superior clearly affecting path of storm systems, but I am not a meteorologist, this is my personal observation.	Moen, Ron
		549	High annual variability – If over 11 year cycle I could see it but doesn't make biological sense (vs. statistical) to have variability that high. Was it an artifact of sampling protocol/effort? The pattern that I see in the figure is relative consistency except for the first year (2014-2015).	Moen, Ron
		609	Somewhere might be good to define what verified means.	Moen, Ron
		644	grammar	Moen, Ron
		700	thought to be	Moen, Ron
		757	may be is not as definitive as I would write	Moen, Ron
		759	From my understanding, Snapshot Wisconsin is extensive, and you could be a bit more definitive here. Not sure if they would share data on number of camera days in northern Wisconsin, for example.	Moen, Ron
		851++	capitalize National Forests?	Moen, Ron
		891	Also on 891. Maybe a global SNR depending on how you decide to do it.	Moen, Ron
		1162	grammar	Moen, Ron
		1357	other areas	Moen, Ron
		1493	increase not maximize	Moen, Ron
		1509	mor	Moen, Ron
		1680	As above, lynx probably could adapt except for the responses of other competitors, bobcats and coyotes.	Moen, Ron
		1718	as in 1680	Moen, Ron
		1817	See comments above about lake effect snow. Why is Lake Effect capitalized?	Moen, Ron
		1840	differences are	Moen, Ron
		1844	missing something	Moen, Ron

		1875++	Would be more figures, but seems like the more important comparison is within a site. i.e., I'd like to see all lines for MN on the same graph. Cap these graphs at 100% on y-axis	Moen, Ron
		1919	suggests	Moen, Ron
		GEN	Hybridization only covered in table, probably ok. Not too biologically important.	Moen, Ron