



Animal Welfare Institute

900 Pennsylvania Avenue, SE, Washington, DC 20003 • www.awionline.org
telephone: (202) 337-2332 • facsimile: (202) 446-2131

February 7, 2012

BY ELECTRONIC (via hcpmainetrapping@fws.gov) AND REGULAR MAIL

Attn: Lynx HCP
Ms. Laury Zicari, Field Supervisor
U.S. Fish and Wildlife Service
Maine Field Office
17 Godfrey Drive Suite #2
Orono, ME 04473

RE: Draft Environmental Assessment, Incidental Take Plan, and Application for an Incidental Take Permit; Maine Department of Inland Fisheries and Wildlife's Statewide Furbearer Trapping Program

Dear Ms. Zicari:

On behalf of the Animal Welfare Institute (AWI) and Project Coyote (PC), please accept the following comments on the Draft Environmental Assessment (hereafter DEA), Incidental Take Plan, and Application for an Incidental Take Permit (hereafter ITP application/HCP) for Maine's Department of Inland Fisheries and Wildlife's Statewide Furbearer Trapping Program (MDIFW). This comment letter focuses on the DEA but is also based on evidence obtained from a variety of other sources including scientific studies, case law, Federal Register notices, and legal briefs and declarations submitted in past litigation on this subject. In addition, since the DEA cites to and/or references, the ITP application/HCP, the application was also carefully reviewed prior to preparing this letter.

This ITP and EA are of significant importance to the threatened Canada lynx, its recovery, and how or if trapping can be permitted in occupied or potential lynx habitat. As a federally protected threatened species, the Endangered Species Act (ESA) requires that lynx be afforded the highest of priorities, that their protection and recovery be paramount for all with management responsibility, and that their take be prohibited unless allowed by the FWS through, for example, an ITP. The protections afforded to species under the ESA are mandatory and not subject to agency (federal or state) discretion, concern about convenience or inconvenience to user groups, or to inherent biases in support of or opposition to trapping.

The ESA prohibits the intentional or incidental “take” of a protected species. Take includes mortality but, as defined in the ESA, includes any harm or harassment done to a protected species. Incidental take can be permitted but only after an ITP is issued. To obtain an ITP, the MDIFW has prepared, as is required, a Habitat Conservation Plan (HCP). Subsequently, the DEA was prepared pursuant to the National Environmental Policy Act (NEPA) to assess the environmental impacts of the MDIFW’s ITP application/HCP, to consider a reasonable range of alternatives to any proposed action, to describe the affected environment, and to articulate and analyze the direct, indirect, and cumulative impacts of alternatives under consideration.

Prior to addressing the analysis in the EA, there are several substantive concerns that must be stated:

1. The MDIFW has not been issued an ITP, yet it continues to allow trapping in Wildlife Management Districts (WMDs) known to be occupied by lynx and lynx continue to be killed, harmed, harassed or taken from traps in violation of the ESA.
2. The MDIFW ITP application/HCP was submitted in 2008 and, therefore, lacks any up-to-date data and analysis required in such documents including critical information on the status of Maine’s lynx population, snowshoe hare densities, habitat conditions, and more recent lynx trapping statistics. Indeed, beyond the fact that lynx research data collected by MDIFW through 2010 has not been analyzed and included in the ITP application/HCP, the population modeling results cited in the ITP application/HCP were based on data obtained when the lynx population in Maine may have been at its peak and does not consider alternative worst case scenarios. Similarly, the habitat mitigation proposal doesn’t contemplate lynx habitat needs when the population is diminished as can occur in response to the cyclic nature of snowshoe hare populations.¹ Though the FWS has provided some of the more recent data in its DEA, the reliance on outdated data in the ITP application/HCP is clear grounds to reject the application.
3. The MDIFW ITP application/HCP is woefully inadequate as evidenced by the amount of missing data, analysis, and other critical information as documented in the FWS DEA. Considering that the ITP application/HCP is, at least, the fifth iteration of this document with the original version produced in 2006, it is astounding that such deficiencies remain -- particularly when the MDIFW has been repeatedly told of the deficiencies by the FWS.² On this basis alone, the ITP application/HCP should be rejected. Examples of such deficiencies include, but are not limited to:

¹ DEA at 27.

² See, for example, August 2, 2007 memorandum from Michael G. Thabault, Assistant Regional Director, Ecological Services, to FWS Regional Director identifying significant deficiencies in a June 2007 version of the ITP for Maine’s trapping program. Deficiencies noted at the time included a failure to consider or employ

- Lack of information regarding what is contained in forestry Best Management Practices, how many landowners are likely to use them, and when and where habitat will be created that minimizes or mitigates incidental take of lynx;³
- Mitigation proposed to establish 5,000 acres of lynx habitat on Maine Bureau of Parks and Lands (MBPL) habitat does not identify the location, habitat quality, use restrictions, permanence, enforceability, development of a management plan, and binding nature of legal mechanisms used to create an area protective of lynx and its habitat;⁴
- Failure to mitigate for other forms of take of lynx from trapping including from harm, harassment or wounding;⁵
- Lack of an active management plan for Canada lynx on lands administered by the MBPL despite existing policies requiring such a plan;⁶
- Failure to address the likelihood of deteriorating habitat quality and/or fluctuating hare numbers;⁷
- Lack of detail as to the nature of conservation agreements with forest landowners and/or the benefits of said agreements to lynx;⁸
- Reference to the Lynx Conservation Strategy as a tool to aid in the monitoring of lynx populations every five years since the Maine Forest Products Council annulled the agreement upon the designation of critical habitat for lynx;⁹
- Insufficient information to assess the rate reporting of incidental captures of lynx making it impossible to assess take in the ITP application;¹⁰
- Lack of detail as to the timing of when lynx habitat is created, failure to mandate to use forest management standards contained in the FWS Canada Lynx Habitat Management Guidelines for Maine, and no requirement to demonstrate that an adequate amount of new lynx habitat will be created –

all practicable minimization measures, a lack of commitment to mitigation measures and uncertain effectiveness of such measures, inadequate plan for monitoring incidental take of lynx and eagle populations, deficiencies in the incidental take determinations and biological assumptions relevant to that determination, and potentially inadequate funding to support the goals of the application. See also, October 23, 2007 letter from Michael Bartlett, Supervisor, New England Field Office, U.S. Fish and Wildlife Service to Ken Elowe, Director, Maine Department of Inland Fisheries and Wildlife which addresses the same concerns as to the MDIFW's June 29, 2007 draft ITP application/HCP.

³ DEA at 26.

⁴ DEA at 26.

⁵ DEA at 27.

⁶ DEA at 27.

⁷ DEA at 27 citing Simons 2009.

⁸ DEA at 28.

⁹ DEA at 29.

¹⁰ DEA at 42, 99.

above the current baseline – to compensate for all forms of take anticipated from trapping;¹¹

- Failure to provide details of the location of mitigation lands, associated roads, etc. prevents an assessment of whether mitigation measures will cause adverse effect to historic properties;¹²
 - Failure to include measures to monitor or to report take of migratory birds and other non-furbearer species, to include an adaptive management plan to address take of migratory birds, or to demonstrate that take of migratory birds and bald and golden eagles by trapping has been adequately addressed or otherwise permitted to ensure that its trapping program is “an otherwise lawful activity”;¹³
 - Lack of specific data on incidental take of non-target animals (including eagles, migratory birds, snowshoe hares) from trapping (species caught, numbers caught, types of traps) making it impossible to quantify and predict short and long-term effects to select alternatives in terms of how non-target species will be affected (positively or negatively), how much incidental take could be avoided, and what the direct and indirect effects of these improvements would have on ecosystems;¹⁴
 - Lack of a reliable estimate of the size of the lynx population in Maine and the uncertainty and lack of statistical confidence limits with recent estimates;¹⁵
 - Failure to base the ITP application/HCP on the best available scientific evidence as required by the ESA;
4. The DEA, though informative and despite providing some recent data missing from the 2008 ITP application/HCP is not adequate as a tool to comprehensively evaluate the direct, indirect, and cumulative impacts of trapping and other impacts on lynx, snowshoe hare, habitat quantity and quality, and other non-target species (including federally protected non-target species); an Environmental Impact Statement (EIS) is clearly required and, in fact, is mandated by NEPA.

For these reasons, which are discussed in greater detail below, it is imperative that the MDIFW ITP application/HCP be rejected, that FWS advise MDIFW that any future take of lynx in Maine will be considered a violation of the ESA and those responsible will be subject to prosecution, and that to obtain an ITP, MDIFW must submit an updated ITP application/HCP which remedies the substantive deficiencies as identified in the DEA. Furthermore, should the MDIFW submit a revised ITP application/HCP, the FWS must

¹¹ DEA at 43.

¹² DEA at 76.

¹³ DEA at 90.

¹⁴ DEA at 94, 95.

¹⁵ DEA at 99.

commit to the preparation of an EIS. This level of analysis is not only required by NEPA but it is justified due to the significant precedent set by this being the first ITP application/HCP assessing the impact of trapping on lynx. In addition and perhaps even more importantly an EIS is required in this case due to the myriad environmental impacts inherent to this action, the fact that many of the impacts are uncertain or involve unknown risk, the significant cumulative impacts relevant here, and due to changing environmental conditions including the implications posed by climate change on lynx, snowshoe hares, and their habitats.

Alternatively, if the FWS elects not to reject the current ITP application/HCP due to its deficiencies, the FWS should decide, at the conclusion of the current planning process, not to issue a Finding of No Significant Impact (FONSI) but, rather, to proceed with the preparation of an EIS. Considering that the FWS has, independent of any public input, identified numerous deficiencies in the MDIFW ITP application/HCP, issuing a Final EA, FONSI, and ITP to MDIFW would clearly represent an arbitrary and capricious decision that could be challenged in federal court. Consequently, should the FWS elect to proceed with the issuance of an ITP based on the current ITP application/HCP and the current DEA, its decision may be subject to legal challenges. If it were to choose this path, AWI and PC would request that, at a minimum, it restrict the duration of the ITP to seven years or less given changing environmental conditions including the impacts of climate change and to ensure that these issues can be revisited sooner to determine if whatever conservation measures that are imposed on MDIFW are effective and/or if additional restrictions are warranted.

Though AWI and PC assert that the need for an EIS is tantamount in this case and that its other recommendations on how to proceed with the decision-making process are entirely consistent with law, it is willing to consider the issuance of an interim ITP by the FWS to MDIFW (pending completion of a revised ITP application/HCP and subsequent NEPA analysis in an EIS) if the FWS requires MDIFW to prohibit all trapping (land sets) in lynx occupied habitat (Alternative E in the DEA) or if it agrees to impose the following mandatory measures on the MDIFW.

- Continue to implement provisions 5a (restrictions on use of foothold traps), 5b (cage trap restrictions), 5d (only the provision that addresses underwater sets for killer type traps and not the remainder of this paragraph), 5f (prohibition on use of snares for any purpose except to trap beaver and bear unless an ITP for snares is obtained)¹⁶, and all of provision 6 contained in the 2007 Consent Decree in *Animal Protection Institute v. Roland Martin*;

¹⁶ Despite including 5a, 5b, 5d, and 5f in this list, it must be noted that AWI and PC strongly object to the use of foothold traps, drowning traps, and/or neck and body snares to capture any wildlife given the inherent cruelty of these techniques. Integration of these portions of the Consent Decree into the mandatory measures contained in any ITP is only being done to preserve those that are most beneficial to lynx and many other

- Prohibit the use of Conibear traps (non-water sets) in WMD 1-11, 14, 18, 19 and in any WMDs where lynx may be found in the future¹⁷ (this would eliminate the need for regulations on leaning pole tree set standards which are confusing, difficult to consistently comply with given accumulating snowfall, and which, as indicated in the DEA¹⁸, have not been sufficient to prevent incidental take of lynx);
- In addition to prohibition on the use of Conibear traps on land in WMD 1-11, 14, 18, 19, require lynx exclusion devices for use with all land-set Conibear traps statewide to mitigate for lynx take during range expansion/change and dispersal.
- Eliminate the early coyote/fox trapping season in October.¹⁹
- Improve current restriction on foothold trap size as specified in the Consent Decree so only foothold traps #1.5 or smaller will be allowed in WMD 1-11, 14, 18, and 19 or in any WMDs where lynx may be found in the future.²⁰ In

species of wildlife on an interim basis pending a revised ITP application/HCP and full analysis of its impacts in an EIS.

¹⁷ ITP application/HCP at 136; the MDIFW indicates if lynx were to become established in other areas of Maine outside WMDs 1-11, it will promulgate rule changes to modify trapping regulations in those areas to make them consistent with trapping regulations in the rest of the lynx range. This action will only be taken if there is evidence from repeated surveys, sightings, or incidental captures that lynx were residing in a WMD outside of currently lynx range. The MDIFW has already demonstrated this mandate by extending certain trapping restrictions to WMDs 14, 18, and 19. However, on page 139 of the ITP application/HCP the MDIFW draws back from this mandatory trigger to expand trapping restrictions by only agreeing to meet with the FWS to determine if regulations should be changes if there are more than two lynx sightings in a township outside of current range within a year or if there is other evidence of home range or reproduction in a township. These conflicting statements must be reconciled. Moreover, the trigger for this mandate – repeated surveys, multiple sightings, or incidental captures of lynx -- is too restrictive given federal protected status of the species and the inevitability of range expansion giving myriad environmental/habitat changes.

¹⁸ DEA at 16; FWS expressing concern that though MDIFW claims no lynx caught in leaning pole Conibear traps since new regulations (which may not be true any longer given incidental capture of lynx in Conibear trap in 2011) went into effect and though no record of lynx being captured in a blind set Conibear trap, “new regulations do not fully eliminate all risk of Conibear traps to lynx.” It then reports on a FWS investigation of lynx mortality at leaning pole sets in which it has been documented that in some instances lynx can ascend poles less than 4 inches in diameter and at angles greater than 45 degrees. Moreover, the FWS reports that some lynx have been documented ascending vertical trees less than 4 inches in diameter.

¹⁹ DEA at 52, “most incidentally-trapped lynx (26 of 42 draft ITP Table 4.1) are caught in the early coyote and fox season in October. Fewer lynx are caught in November (15 of 42 lynx, J. Vashon, MDIFW, pers. comm.) and December (1 of 42 lynx caught in Maine, draft ITP Table 4.1).”

²⁰ This provision must not be interpreted as endorsement by AWI or PC to the use of any foothold trap in or outside of lynx occupied range in Maine or elsewhere. AWI and PC strongly objects to the use of the foothold trap for trapping animals due to the capture of non-target species and because of the injuries that can be sustained by animals caught in such traps – including padded traps. This provision is only offered here as a temporary mechanism to permit use of a specific type of foothold trap pending completion of a revised ITP application/HCP and EIS. Moreover, the use of this specific type of foothold trap, if permitted, must also be further restricted by the enactment of other temporary limitations to further reduce the potential for lynx or other non-target species capture in foothold traps.

addition, only Soft Catch foothold traps with padded offset jaws with short chain anchors (no longer than 8 inches) and swivels at terminal end, base plate, and in-line will be allowed.²¹

- Prohibit the use of any bait and scents (including scat, urine, or synthetic products), drags, and require the use of short chains (no longer than 8 inches), swivels, and in-line springs, and pan tension devices in any foothold trap sets (non-water sets) in WMDs 1-11, 14, 18, 19 and in any WMDs where lynx may be found in the future²²;
- Limit the upland, dryland trapping season in WMDs 1-11, 14, 18, and 19 and in any WMDs where lynx may be found in the future to November until December 1 to largely avoid frostbite or exposure related injuries;²³
- Impose a 24 hour trap check or tend time requirement for all traps, foothold, Conibear, and any others that may be used in Maine, statewide;²⁴
- Require that the MDIFW establish a mandatory statewide reporting²⁵ requirement for ALL non-target animals (birds, fish, mammals, reptiles) incidentally captured in traps;²⁶

²¹ According to information contained in the DEA, the MDIFW lynx research project resulted in lynx being captured in Victor #3 Soft Catch foothold traps with padded offset jaws 81 times (DEA at 17) with none of the animals requiring veterinary attention and, allegedly, no reported injuries. However, as disclosed by the FWS (but not the MDIFW), one lynx captured as part of the MDIFW research project sustained a broken leg “when a stick became wedged in a swivel and the animal twisted and broke its leg.” DEA at 41. The traps used in this research project were anchored by a short chains with swivels at the terminal end and base plate of the trap and with an in-line swivel (DEA at 41 citing A. Vashon , pers. comm.). Since biologists employ techniques when trapping prospective research animals to ensure the health of the animal that trappers don’t employ given their interest in killing the animal and considering the terms of the Consent Decree, imposing a restriction requiring the use of only #2 or smaller foothold traps will likely minimize, but won’t entirely eliminate, the possibility of injury to any incidentally captured lynx.

²² The requirement for the use of pan tension devices could reduce lynx incidental take from traps set for coyotes but would not address incidental take in traps set for bobcat or fox. DEA at 50.

²³ As indicated in the DEA, such a restriction would not likely impact those trapping martens since the majority of the marten harvest occurs during the first two weeks of the season and would not affect either marten or fisher trapping numbers significantly. DEA at 51. Indeed, the MDIFW limited the marten and fisher trapping season to only 4 weeks in November in 2008 to reduce kills demonstrating that there is precedent for limiting the length of the trapping season which would significantly benefit lynx by reducing the chance of incidental take and, if trapped, reducing the likelihood of frostbite/exposure injuries.

²⁴ This request is entirely appropriate given that the MDIFW is seeding an ITP that would be statewide in its scope. Consequently, requiring a 24-hour trap check time throughout the state is in line with the terms of the requested ITP. Furthermore, taking this action will likely reduce the mortality rate for incidentally captured non-target species while reducing the pain and suffering of all species captured in traps.

²⁵ ITP application/HCP at 84; MDIFW concedes that mandatory report “will also improve the accuracy of the data collected by the Department on lynx incidental captures and is essential for assuring that lynx are examined for any injuries related to the incidental trapping event.

²⁶ For non-target animals found dead in a trap it is possible that such a requirement already exists as suggested in the DEA. In MDIFW’s 2011-2012 Hunting and Trapping Laws and Rules publication trappers are advised to report to a game warden the capture of any animal that he/she is not allowed to keep if the animal is found dead in a trap. For non-target animals who are still alive in a trap, the trapper is just advised

- Prohibit the live capture (by “beagle clubs”²⁷) or hunting of snowshoe hare within WMDs 1-11, 14, 18, and 19 and in any WMDs where lynx may be found in the future to maximize availability of snowshoe hares for lynx;
- That ALL trappers, including children, non-residents, and others are required to take a trapper education course,²⁸ to take a refresher course at least every three years, that all courses be taught by qualified wildlife biologists, and that a rigorous test be developed which every trapper has to pass in order to obtain a license;
- The development of a trapping DVD as an educational tool to be sent, with existing materials, to every licensed trapper (resident or non-resident) and to be used as a training tool in trapper education courses;
- Seek the professional opinion of at least three veterinarians, to be mutually agreed upon by MDIFW and FWS, to develop, in collaboration with MDIFW and FWS, guidelines for evaluating lynx trap injuries, to review the MDIFW trap injury protocol, to require MDIFW to change said protocol based on veterinarian input, and to train MDIFW biologists to assess lynx injuries;
- Develop a new protocol for releasing incidentally trapped lynx which forbids the use of catch poles given potential adverse consequences, including mortalities, associated with this tool;
- Contract for the services of a qualified veterinarian to assess the condition of any lynx, preferably in the field, reported to be trapped²⁹ if said assessment can be accomplished when feasible, consistent with MDIFW policies on inspecting incidentally trapped lynx, and only when not likely to result in additional injury due to delay in conducting the assessment;

to release the animal and there is no reporting requirement. However, Maine’s actual trapping regulations, which were appended to the ITP application/HCP, only require that non-target furbearers found dead in traps are reported. A requirement that MDIFW mandate that all non-target species captures, whether dead or alive in a trap, be reported would substantially aid in quantifying the impact to non-target species and in developing strategies to reduce that take.

²⁷ ITP application/HCP at 209, 210; current MDIFW trapping regulations permit “beagle clubs” to be licensed to trap (live) snowshoe hares. The trapped hare can only be used to “stock the running area” of the licensee for the purpose of training dogs. This practice is highly controversial and objectionable given the pain and suffering inflicted on the hare subject to pursuit and possible capture by dogs and should be banned.

²⁸ Under current Maine trapping regulations, persons between the ages of 10 and 16 must obtain a junior trapping license, but can trap without having taken a trapper education course, as long as they are accompanied by an adult. 12 MRSA §12201(7). Notably, there is no requirement that the adult accompanying the child into the field have a trapping license or take a trapping education course. *Id.* §12201(2)(c) and for non-resident trappers, they too are not required to take a trapper education course in Maine as long as they have a valid trappers license from another state. Though education must be an element in the strategy to reduce the incidental take of lynx, it will not eliminate the potential for non-target animal take and injury in traps.

²⁹ DEA at 33, “having a veterinarian experienced with wildlife and trapping present could provide useful insights into the extent, number, and type of injuries and whether capture myopathy, chemical immobilization and injuries sustained in traps are a serious problem for trapped lynx.”

- Develop a strategy to randomly select a minimum of one half of trappers actively trapping in WMDs 1-11, 14, 18, and 19 per year who would be accompanied into the field by MDIFW game wardens to check trap lines to determine compliance with state trapping regulations including any required Best Management Practices (BMP)³⁰ and to report their findings annually to the FWS;³¹
- Develop additional incentives (both positive and negative) to ensure the mandatory reporting of trapped lynx which could include mandatory fines and/or revocation of trapping privileges for non-reporting incidents;³²
- Amend, as necessary, MDIFW regulations and training procedures to prevent, to the fullest extent possible, the incidental, non-target take of other federally protected species (e.g., birds protected under the Migratory Bird Treaty Act, federally listed candidate species) and to require the reporting of the capture, condition, and disposition of ALL non-target species;
- Become a participating member of the Wildlife Violator Compact (if that has not already occurred);
- Develop forestry Best Management Practices for use on public and private forest lands to provide benefits to lynx and their primary prey while also preserving habitat for other forest-dependent species;
- For each adult female lynx, two adult male lynx, two juvenile lynx, and two lynx kittens removed from the population due to incidental take (resulting in mortality or injuries so severe that the animal cannot be returned to the wild) and to compensate for lynx subject to incidental take (i.e., harm, harassment) but not removed or lost from the population, require the creation of 10,000 acres of lynx habitat on public and/or private lands in a timely manner upon issuance of the ITP. This mitigation habitat must: be at an appropriate location within the designated critical habitat area; created in a timely manner using minimally

³⁰ This should not be interpreted as suggesting that either AWI or PC believe that BMP traps are, in fact, the best traps available for the trapping of a particular species. The BMP process, though sold as a means to find the best traps, is actually a political exercise designed to permit the continued use of foothold traps which have been banned by a number of countries worldwide.

³¹ According to the DEA, in survey results reported by Nelson and Verbyla (1984), state wildlife agencies indicated that the most effective law enforcement programs (ranked highest to lowest) were increased compliance monitoring, education, peer-group pressure, increased penalties, and rewards. DEA at 44. Furthermore, the Maine Warden Service conducted such an effort to increase trapping enforcement in 2007 checking approximately 1/3 of Maine's trappers, 2,770 trapping sets and resulting in 267 violations found.

³² As reported by the FWS, trappers that it interviewed during its preparation of the DEA "recommended stiff, mandatory penalties for failure to report the incidental take of a lynx to ensure that take was being quantified accurately." DEA at 42.

invasive habitat manipulation techniques (if any manipulation is necessary);³³ impose permanent management measures (to be articulated in a management plan) suitable for lynx, snowshoe hares, and other wildlife species; include use restrictions including a complete prohibition on all trapping; impose monitoring measures for lynx and their prey; delineate enforceability standards; establish restrictions on recreational activities potentially harmful to lynx (e.g., snowmobiling, packing snowmobile routes, excessive ORV use); and provide binding legal requirements to ensure long-term management of habitat primarily for lynx, their prey, and other wildlife;

- Reinitiate lynx research activities to continue to obtain information about lynx ecology, biology, behavior, and threats to the species in Maine;
- That the MDIFW complete and submit to the FWS for its review its lynx management strategy³⁴, a lynx habitat plan, Best Management Practices for forestry practices to benefit lynx on private lands, studies/report analyzing past lynx research conducted by MDIFW, reports/studies pertaining to collaborative research with the University of Maine to identify better ways to monitor lynx and snowshoe hare populations, documentation of compliance with Migratory Bird Treaty Act and Bald and Golden Eagle Protection Act requirements relevant to incidental take of migratory birds including eagles, the Memorandum of Understanding with MBPL, and other documents/reports referenced in the ITP application/HCP within one year after the issuance of the interim ITP;³⁵
- Complete a revised ITP application/HCP within one year or, if not, the interim ITP is withdrawn and any incidental catch of any lynx will subject the person responsible, including the state official authorizing trapping in lynx occupied habitat, to potential prosecution under the ESA.

These mandates would be in addition to exiting efforts undertaken by the MDIFW to address or mitigate incidental takes of lynx (e.g., communication with trappers and trapping associations, collaboration with other state agencies, maintenance of lynx hotline, maintenance of list of veterinary care and wildlife rehabilitators capable of handling/treating injured lynx, recommending that traps not be set and/or be pulled from areas containing lynx sign). In addition, if such an interim ITP is issued containing the

³³ See DEA at 43, “the draft ITP should also specify the timing of when lynx habitat is created and use forest management described in the Service’s Canada Lynx Habitat Management Guidelines for Maine (pp. 19-35, McCollough 2007, <http://www.fws.gov/mainfieldoffice/>).”

³⁴ ITP application/HCP at 67. The MDIFW claims in its ITP application/HCP to have engaged in a strategic planning process to create a lynx management strategy which, included, feedback from public working groups. Wildlife advocates in Maine that AWI and PC work with are unaware of any such process and/or of a lynx management strategy.

³⁵ Various plans, reports and other documents under preparation are referenced throughout the ITP application/HCP; See, e.g., ITP application/HCP at 82, 110, 111, 120.

restrictions articulated above, the FWS must also commit to the preparation of an EIS to evaluate the revised ITP application/HCP within three years of the issuance of the interim ITP.

While Alternative E is clearly the option that is most consistent with the protective mandates of the ESA, if the requirements articulated above were imposed on MDIFW it is certain that the incidental take of lynx would be far less likely than under current regulations and practices. Ultimately, imposing these suggested restrictions on trapping within lynx habitat while issuing an interim ITP as suggested herein will benefit lynx and other species while still requiring the MDIFW to revise and improve its ITP application/HCP in order to reapply for a long-term ITP.

Furthermore, the FWS must also establish clear and substantive penalties that will be triggered if the level of take permitted in the ITP is exceeded. This penalty should be, at a minimum, the termination of all upland/dryland trapping within WMDs 1-11, 14, 18, 19 pending formal reassessment of the ITP, including an opportunity for public comment, and the issuance of a new or amended ITP by the FWS.

The remainder of this comment letter addresses general information about lynx, lynx habitat, and the threats to the species. This analysis is largely, but not entirely, restricted to Maine. This is followed by a detailed analysis of the sufficiency of the DEA.

Status of the Lynx & Vulnerability:

Historical & Current Range:

In the lower 48 states, Canada lynx (*Lynx canadensis*) inhabit both boreal forests and subalpine coniferous forest or northern hardwoods.³⁶ The historical range of the species in the contiguous states includes the northeastern states from Maine, south to New York and Pennsylvania, and east to Massachusetts; the western Great Lakes region; the Rocky Mountains from Montana, Idaho, and Oregon south to Utah and Colorado; and in the Cascade Range of Washington and Oregon.³⁷

The remaining lynx population in the lower 48 states, including Maine, has declined dramatically for many reasons, including habitat loss, degradation, and fragmentation, trapping, hunting, road building and other development.³⁸ In addition, there is evidence that competition (often facilitated by human actions including the maintenance of packed snow roads to facilitate snowmobile recreation) between lynx and other species, notably bobcat

³⁶ 63 Fed. Reg. 36994, 36995 (July 8, 1998); Aubry et al. 2000; Ruediger et al. 2000.

³⁷ 63 Fed. Reg. at 36994-6; McCord and Cardoza 1982; Quinn and Parker 1987; Ruediger et al. 2000.

³⁸ See *Defenders of Wildlife v. Babbitt*, 958 F.Supp. 670, 673 (D.D.C. 1997).

and coyotes, for snowshoe hare can adversely impact lynx. Lynx are now scattered in small subpopulations in a very few states and have been completely eliminated from approximately seventeen states that the species once occupied.³⁹ These subpopulations persist in four different regions: the Northeast, the Great Lakes, the Southern Rocky Mountains and the Northern Rocky Mountains/Cascades.

Population Status and Trend:

In Maine, lynx have been documented since the 1800s.⁴⁰ While absent from southern Maine after 1912, likely due to overexploitation and habitat modification, lynx have been present throughout northern Maine from at least 1833 to the present.⁴¹ FWS recognizes that resident, breeding lynx populations exist in the state.⁴²

The MDIFW indicates that research and management activities are essential for the accurate monitoring of lynx populations, for identifying the forest management techniques that provide the best conditions for snowshoe hare and lynx, and are essential to modeling efforts to predict lynx occurrence and densities.⁴³ Nevertheless, lynx population surveys have not been considered practicable over a large geographic area because the low lynx densities, their cryptic nature making them difficult to spot from the air or ground, and due to the time and number of personnel that would be needed to conduct a proper mark-recapture study over a large geographic area.⁴⁴

Instead, the MDIFW relies on population indices including incidental trapping rates, lynx sightings, and lynx road mortality to estimate the level of change in the lynx population. Yet, in a complete contradiction, the MDIFW indicates that the number of lynx incidentally caught is too low to give an accurate picture of the degree that the lynx pop may be changing clearly undermining incidental captures as an indice for population estimation.⁴⁵ Similarly, the use of lynx sightings (due to the remoteness of lynx habitat and the low density of people living/using the area) and lynx road mortality (due to limited numbers of such incidents) would be just as inadequate as an measure of population size and, in particular, would not be able to readily detect, if at all, shifts in population trends.

Though the cryptic nature of lynx may increase the difficulty of obtaining precise population estimates, it can be done. Indeed, if the MDIFW invested funds into such an effort it could obtain a lynx population estimate that would be far more statistically reliable

³⁹ See *Defenders of Wildlife v. Babbitt*, 958 F.Supp. 670, 673 (D.D.C. 1997).

⁴⁰ 65 Fed. Reg. at 16055.

⁴¹ Hoving 2001.

⁴² 65 Fed. Reg. at 16055.

⁴³ ITP application/HCP at 81.

⁴⁴ ITP application/HCP at 51.

⁴⁵ ITP application/HCP at 119.

than those currently available for lynx in Maine. Since the MDIFW has not yet made this effort, it has, instead, relied on various indices to obtain estimates of lynx density and population size.

For example, lynx and snowshoe hare habitat monitoring is one potential mechanism available to estimate how many lynx an area may support. This is based on evidence demonstrating that as snowshoe hare habitat declines, the lynx population declines and vice-versa. This technique, however, is not suitable for monitoring whether lynx mortalities caused by incidental trapping would have any effect on the lynx population.⁴⁶ While presence/absence surveys have and will continue to be used in Maine to assess lynx populations, due to the ephemeral nature of lynx habitat, this methodology can only, at best, detect gross changes in the lynx population.⁴⁷ Similarly, relying on satellite imaging techniques to monitor lynx populations, would also not provide the accuracy needed to detect small changes in a lynx population,⁴⁸ though it is the best technique available for monitoring of early successional forest habitat.

Ideally, as suggested by the MDIFW, information on lynx sightings, snowshoe hare densities, or habitat conditions could be used along with demographic and home-range data from the lynx study to develop a more precise population model. Yet, despite the research it has done on its lynx population, it reported in the ITP application/HCP that “detailed information on lynx and snowshoe hare are only available for a small portion of northern Maine.”⁴⁹ This fact combined with the reality that there is currently no reliable methodology or tool being used to assess lynx and snowshoe hare populations in Maine raising questions about the ability of the MDIFW – or the FWS – to accurately assess the impact of incidental trapping as well as a variety of other natural or anthropogenic threats to lynx.⁵⁰

In Maine, though there is compelling evidence that lynx should be included on the state’s protected species list, the species is currently designated as a species of special concern. As such, it is protected from trapping and hunting though, as recently as 1967, the species was trapped, hunted, and bountied in the state.⁵¹ Estimates of the size of Maine’s lynx population are varied. In 2006, MDIFW estimated that approximately 200-500 lynx inhabited the State, although the agency conceded that this was merely an estimate and is not based on a formal

⁴⁶ ITP application/HCP at 119.

⁴⁷ ITP application/HCP at 120.

⁴⁸ ITP application/HCP at 121.

⁴⁹ ITP application/HCP at 51.

⁵⁰ ITP application/HCP at 120; MDIFW is reportedly working with the University of Maine to find better ways to monitor lynx and snowshoe hares but, as of 2008, the methodology was still being developed. Has a new tool for monitoring hare and lynx populations been developed over the past few years, has it been field tested? This would be valuable information to include in future analyses of this issue.

⁵¹ 65 Fed. Reg. at 16055.

census.⁵² In the same year, according to information in the ITP application/HCP, the MDIFW estimated that “there were at least 500 lynx in Maine.”⁵³ This estimate was based on several indices including changes in lynx distribution, track counts, frequency of road-killed lynx, incidental trapping frequency, verified sightings, and adult female lynx reproductive rates; indices that MDIFW concedes are limited in their ability to detect increments of change in the statewide population.

Despite this claim of “at least 500 lynx in Maine,” the MDIFW also reports in the ITP application/HCP that “a refined estimate of Maine’s lynx population is currently not available,”⁵⁴ and that scientists are still attempting to determine the relationship between lynx densities and habitat type and whether the relationship can be predictive of lynx occurrence on a landscape scale. Simons (2009) estimated Maine’s lynx population in 2007 at 236-355 animals on 3.56 million acres within the 6.8 million acres of designated critical habitat.⁵⁵ In The FWS also reports that the MDIFW, in 2011, estimated that there were between 300 and 1,200 lynx within designated critical habitats.⁵⁶ To obtain this estimate, the FWS reports that MDIFW used snow track count data to determine the proportion of the range occupied by lynx and then applied the lynx density estimate from its northern Maine study site to the entirety of occupied range.⁵⁷ This procedure, assumes that the density of lynx across all occupied habitat is the same as that in the MDIFW study site which is entirely unproven and potentially introduces significant error into any population estimate.

Despite the lack of an accurate population estimate, it is clear that the trend in lynx numbers have varied over time. Both the MDIFW and Simons (2009) report that the data suggest that lynx numbers have increased since 1985 with the MDIFW reporting a population peak in 2003 or 2004.⁵⁸ In somewhat contradictory statements, the MDIFW claims that it “may be unreasonable to expect lynx numbers in Maine to increase significantly in the near future”⁵⁹ suggesting that the current lynx population is stable or will gradually increase while the FWS makes clear that all indicators suggest that the lynx population in Maine will decline rather significantly in the future.

⁵² MDIFW 2007a.

⁵³ ITP application/HCP at 21.

⁵⁴ ITP application/HCP at 19.

⁵⁵ DEA at 6.

⁵⁶ DEA at 6.

⁵⁷ DEA at 5.

⁵⁸ DEA at 6, ITP application/HCP at 21, 52; Determination of lynx population peak was, according to MDIFW, based incidental trapping rates for lynx, kitten production rates, snowshoe hare habitat projections, and snowshoe hare densities. However, MDIFW also claims that, despite a reduction in the number of kittens/adult female lynx since 2003, this statistic is not sufficient in itself to conclude that Maine’s lynx population has declined. Rather, a set of indices must be considered which, when examined, did demonstrate a substantial change in lynx demographic characteristics the mid-to-late 2000s.

⁵⁹ ITP application/HCP at 54.

The FWS has to, based on the best available scientific evidence of the species' population trends, determine the actual status of the lynx population in Maine since the long-term population outlook is vitally important in determining the proper baseline here, and in gauging the relative impact of trapping nearly 200 lynx over a 15-year period to avoid jeopardy to the species (*i.e.*, ensure that the trapping program will not "reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild").⁶⁰

The MDIFW statements suggests that it is attempting to downplay any potential decrease due to habitat loss, degradation, and or incidental trapping as it understands that, as the lynx population declines, the likelihood of additional restrictions on trapping to protect and recover the remaining lynx will increase. According to Simons (2009), lynx density is projected to decline by 65 percent if current silviculture trends continue and that, even under the best possible scenario (*i.e.*, maximum clearcutting), lynx density may decline by 55 percent by 2032.⁶¹ This is not to suggest that lynx won't expand their range but, any range expansion in Maine is likely to be to the south⁶² where lynx will experience greater competition with bobcats and fisher and greater risk associated with reduced snow accumulations^{63 64}.

According to the FWS, the density of the primary prey of the lynx, the snowshoe hare, declined in Maine between 2005 and 2010 by 50% or more even in optimal regenerating clearcut habitat though it is not clear if this represented a stochastic or natural fluctuation, or an attenuated hare cycle.⁶⁵ As documented by the MDIFW, in 2006 winter snowshoe hare densities dipped below 1.5 hare/ha in regenerating conifer stands and below 1.0 hare/ha in remaining habitats which led to the lowest documented productivity of lynx during the spring of 2006 with only 1 of 8 adult female lynx producing a litter.⁶⁶ This was consistent with a three year decline in lynx productivity with the lowest observed level (# kittens/adult female decreased 93 percent) in spring 2006 followed by winter 2007 when adult lynx mortality more than doubled (39% vs. average documented mortality during study of 17%). Yet, as reported in the DEA, hare populations reportedly began to rebound in 2010 and 2011.⁶⁷ As the hare population recovered, all radio-tagged female lynx produced young in the spring of 2010 and kitten survival rates seemed to increase in 2011.⁶⁸

⁶⁰ 50 C.F.R. § 402.02.

⁶¹ DEA at 7.

⁶² The recent discovery of four Canada lynx kittens near Pittsburg, New Hampshire provides evidence of ongoing lynx range expansion even if the overall population trend is in decline. Concord Monitor, '*Checking in on New Hampshire's lynx*,' January 15, 2012.

⁶³ Lynx tend to have a competitive advantage over other species in deeper snow due to their large paw surface areas which enable lynx to traverse landscapes with high accumulation of snow easier and with less energy than other species, facilitating its ability to hunt.

⁶⁴ DEA at 7.

⁶⁵ DEA at 7.

⁶⁶ See May 2, 2007 memorandum from Jennifer Vashon to Ken Elowe, Mark Stadler, Wally Jakubas, Rich Dressier, and George Matula re: Lynx Study Update and USFWS 5-year status review.

⁶⁷ DEA at 7, 8 citing Scott 2009, D. Harrison, University of Maine, unpublished data.

⁶⁸ DEA at 8.

Indeed, as evidenced by information in the preceding paragraph, lynx are highly dependent on snowshoe hare as their primary prey populations generally fluctuate within the 10-year population cycles⁶⁹ creating a symbiotic relationship where lynx require healthy hare populations to survive and flourish. When hare densities are high, the scientific evidence suggests that lynx have smaller home ranges, the overall age of average female reproduction is higher, there are larger litters, there's high recruitment and kitten survival, high emigration of subadults, and, as would be expected, a high proportion of hare in the diet.⁷⁰ When hare densities are low, lynx populations demonstrate the opposite characteristics (*i.e.*, dramatically larger home ranges, smaller litters or forego reproduction, low or no recruitment, low kitten and adult survival, increased adult dispersal, and a switch to alternative prey.⁷¹ Furthermore, when snowshoe hare densities are low, lynx tend to travel greater distances, tend to be undernourished, and, therefore are more likely to both encounter traps, be attracted to traps, and are more vulnerable to incidental capture compared to when lynx densities are high. Consequently, any threat to the snowshoe hare or its habitat is a direct threat to lynx thereby necessitating not only comprehensive protections for lynx but also for snowshoe hares.

Habitat Needs and Trends:

Lynx are a wide-ranging species with significant dispersal potential, especially during times of prey scarcity and when males are seeking new territories. Regenerating forests (12 to 35 years of age) appear to be the highest quality habitat for snowshoe hares and, consequently, lynx. Conversely, snowshoe hares are negatively associated with recent clearcuts and mature forest.⁷² It is believed that widespread clearcutting of softwood forests damaged by the spruce budworm outbreak that occurred from 1973 to 1985, created the conditions that led to the estimated peak in Maine's lynx populations in the early 2000s.⁷³ As these stands mature, however, lynx populations are expected to decline as is currently the case. Forest management and silviculture practices, therefore, are directly correlated with snowshoe hare and, in turn, lynx densities.

In order to achieve long term habitat security for lynx there must be a clear understanding of how lynx and their primary prey, snowshoe hare, utilize different forest management regimes.⁷⁴ According to the MDIFW, as of 2008 when it submitted its ITP application/RCP, approximately 2/3 of Maine's forests are comprised of regenerating stands of timber and pole size timber.⁷⁵ These stands, most of which are on privately owned

⁶⁹ 63 Fed. Reg. at 36695 citing Elton and Nicholson 1942, Hodges 2000, Krebs et al. 2001.

⁷⁰ DEA at 7.

⁷¹ DEA at 7.

⁷² ITP application/HCP at 15 citing Litvaitis et al. 1985, Monty 1986, Lachowski 1997, Fuller 1999, Hoving et al. 2004, Robinson 2006.

⁷³ DEA at 6.

⁷⁴ ITP application/HCP at 116.

⁷⁵ ITP application/HCP at 53.

land managed for timber production, represent the majority of snowshoe hare habitat in Maine yet, due to their age and natural succession, they may no longer provide optimal habitat for snowshoe hares.⁷⁶ In addition to the loss of hare habitat due to succession changes in Maine's forest, current forest harvesting practices may reduce the temporal availability of and amount of optimal hare habitat in the future.⁷⁷

As indicated in MDIFW's ITP application/HCP, MBLP's forest management practices create very little early successional habitat due to the preferred use of selection and extended shelterwood cuts which, while maintaining canopy cover, are not optimal for creating stands of dense regenerating conifers.⁷⁸ Consequently, these techniques have created approximately 10-200 acres of early successional habitat annually.⁷⁹ Indeed, as reported by the MDIFW, there is a growing body of evidence which suggest that current forest practices may not produce conifer stands that are capable of supporting hare densities as high as those measured in regenerating clearcuts⁸⁰ or sufficient to sustain lynx. Reportedly, clearcutting, in time, will create ideal snowshoe hare and lynx habitat though this comes at a cost, potentially considerable, to marten (a species also subject to trapping and that is in decline in portions of Maine), other wildlife, and ecosystem functions.⁸¹

Recognizing the relationship between hares and lynx, this trend supports evidence that the lynx population in Maine has declined from its peak in 2003 or 2004. Though apparently reluctant to admit to this fact, the MDIFW does concede that lower hare densities are consistent with our observation of low levels of lynx reproduction and with the "hypothesis" that lynx numbers in Maine are no longer increasing."⁸² Yet, instead of conceding that its lynx population is declining, the MDIFW is only willing to state that "it may be unreasonable to expect lynx numbers in Maine to increase significantly in the near

⁷⁶ ITP application/HCP at 53 citing Jakubas and Cross 2001, Robinson 2006.

⁷⁷ ITP application/HCP at 24 noting that research to determine the extent current forestry practices can sustain snowshoe hare populations and, in turn, lynx is ongoing at the University of Maine.

⁷⁸ It is clear from the DEA and ITP application/HCP that, though the FWS and MDIFW disagree over the current status of Maine's lynx population but suggest that, for lynx to persist in Maine, some level of natural or artificial (human-induced or caused) habitat manipulation in the form of timber harvest including, but not limited, to clearcutting, may be necessary. Given the impacts of such actions on a whole host of forest dwelling, climax species and the ecology of those ecosystems, any such human manipulations, if undertaken, must be properly studied to understand and attempt to mitigate for potential impacts to those species. In other words, such manipulations are likely to result (short term and long-term) in both beneficial and adverse impacts to a wide variety of species and those impacts should be understood, evaluated, and benefits/impacts weighed before action is taken.

⁷⁹ ITP application/HCP at 110.

⁸⁰ ITP application/HCP at 55; See also DEA at 7 citing Simons 2009, Scott 2009.

⁸¹ For example, providing roads into an area can lead to soil erosion, increased access to the area by hunters, trappers, and other uses, an increase in the amount of edge habitat, changes in predator-prey dynamics, and potentially increase invasive species among other impacts.

⁸² ITP application/HCP at 55; DEA at 7.

future, given current forest conditions and forest harvesting patterns.”⁸³ Conversely, recognizing that Maine’s lynx population is declining, the FWS cautions that lynx habitat to compensate for snowshoe hare population declines may need to be considerably larger in the future.⁸⁴

Given the connection between lynx and hares, the density of snowshoe hares is considered one of the most important factors determining whether lynx can persist in an area. According to MDIFW, snowshoe hare densities at its lynx study areas⁸⁵ (i.e., Clayton Lake and Telos) declined in 2006 with densities, even in the best habitats on these sites, now below 1.5 hares/hectare⁸⁶ which “may be close to the threshold needed to support a lynx population”⁸⁷ though MDIFW claims that “the exact density of hares needed to maintain lynx populations in Maine is not known.”⁸⁸

Lynx home range size varies from 12 to 439 square kilometers, depending primarily on the density of lynx and availability of prey in the area.⁸⁹ Recent research shows that average home range of male lynx in Maine is 54 square kilometers and 26 kilometers for females.⁹⁰ Lynx home ranges shift spatially and temporally across the landscape as a result of natural (e.g., fire, forest maturation) and human-caused (e.g. logging, thinning) changes and lynx can make long distance exploratory movements outside their home ranges.⁹¹

During times of stress when prey availability declines, lynx disperse greater distances. As a consequence of these expanded movements caused by a reduction in available prey, lynx

⁸³ ITP application/HCP at 54.

⁸⁴ DEA at 7.

⁸⁵ ITP application/HCP at 53; the MDIFW indicates that the lynx study area is not representative of all of Maine. Indeed, Bill Krohn of the U.S. Geological Service, who had reviewed “the lynx ET worksheet and listing recommendation” also raised concerns about the Clayton Lake study site being representative of other lynx habitat in Maine because it is located in a set of townships that are subject to heavy timber harvest which would suggest that the regenerating timberlands provide ideal habitat for lynx. See March 17, 2006 email from Walter Jakubas of MDIFW to Ken Elowe of MDIFW. Though, in a June 26, 2007 document entitled “Response to Bill’s comments re: Lynx state listing recommendation,” the MDIFW disagrees with the suggestion that the Clayton Lake study site provides higher quality lynx habitat than other areas in the state. Yet, it does indicate that it would be speculative to suggest that other hare populations in Maine are experiencing density fluctuations like the hare population near Clayton Lake and Telos suggesting that there may, in fact, be something unique about those sites that does distinguish them from other sites. If either of the lynx study sites do, in fact, provide higher quality lynx habitat than other state lands, this clearly calls into questions the MDIFW’s practice of using lynx densities from its study sites to extrapolate to all known lynx range to develop lynx population estimates and, in turn, the validity of said estimates..

⁸⁶ ITP application/HCP at 54 citing to Dan Harrison, University of Maine (unpub. data); Jennifer Vashon, MDIFW (unpub. data).

⁸⁷ ITP application/HCP at 55 citing Steury and Murray 2004.

⁸⁸ ITP application/HCP at 55.

⁸⁹ 63 Fed. Reg. at 36695 citing Moen et al. 2005; Mowat et al. 2000.

⁹⁰ Vashon et al. 2008.

⁹¹ Aubry et al. 2000; Squires et al. 2001; Moen et al. 2004.

become far more vulnerable to human exploitation including incidental take in traps and other anthropogenic factors.⁹² This relationship counsels for even greater protections to be afforded lynx throughout their existing and potential range to compensate for those times when their prey base is diminished. As indicated in the DEA, “to accommodate hare declines, landscapes needed to support lynx home ranges in Maine may need to be considerably larger in the future...”⁹³ Yet, as cautioned by the FWS, in some areas, hare densities may decline to a point of no longer being able to support lynx.⁹⁴

Threats:

The final listing rule (65 FR 16052) and remand (68 FR 40076) address some of the threats to Canada lynx. In summary, the Service concluded that the lack of Federal land management plan guidance for conservation of lynx, and the potential for forest management plans to allow direct actions that adversely affect lynx, were a significant threat. In Maine, forest practices on private timber lands are reported to have the greatest influence on lynx recovery.

Though its impacts are downplayed by the MDIFW in its ITP application/HCP, trapping, including incidental trapping, poses a serious threat to lynx. As reported in Ecology and Conservation of Lynx in the United States, “lynx appear to be extremely susceptible to trapping, and where trapping is permitted it can be (and has been) a significant source of mortality.”⁹⁵ Similarly, in the Canada Lynx Conservation Assessment and Strategy Plan, it states that “lynx are known to be very vulnerable to trapping.” Even Maine concedes this point in its own Comprehensive Wildlife Conservation Strategy which states that “trapping and illegal take are threats to lynx.”⁹⁶ Therefore it is hardly a surprise that trapping is one of the activities that led to the imperiled status and subsequent ESA listing of Canada lynx due to incidental take.⁹⁷ Indeed, one study found that approximately 86% of lynx mortalities were caused by trapping⁹⁸ with mortality caused by trapping likely additive to natural mortality.⁹⁹

Compared with most large North American carnivores, lynx are extremely susceptible to traps, owing to their natural curiosity and attraction to novelties in their environment. Where trapping is permitted it can be (and has been) a significant source of mortality.¹⁰⁰

⁹² Carroll 2005; Ruggiero et al. 2000; Murray et al. 2008.

⁹³ DEA at 7.

⁹⁴ DEA at 7 citing Scott 2009.

⁹⁵ Ruggiero et al. 2000.

⁹⁶ MDIFW 2005.

⁹⁷ 65 Fed. Reg. 16052 (March 24, 2000).

⁹⁸ *Defenders of Wildlife v. Babbitt*, 958 F.Supp. at 681.

⁹⁹ ITP application/HCP at 44 citing Brand and Keith 1979 though Burnham and Anderson (1984) claim that, for most species, trapping is compensatory to a threshold and additive thereafter.

¹⁰⁰ Ruggiero et al. 2000. The Canada Lynx Conservation Assessment and Strategy Plan states “Lynx are known to be very vulnerable to trapping. Ward and Krebs (1985) stated that trapping was the single most important mortality factor in their Yukon study area. Incidental trapping of lynx can occur in areas where

Unlike canids (coyotes, foxes, wolves), Canada lynx do not become trap shy after having been trapped once.¹⁰¹ They are particularly vulnerable at the beginning of trapping seasons as they are naturally curious animals and therefore are often attracted to novel things (e.g. traps) in their environment.¹⁰²

Depending on age and sex, lynx can demonstrate a variable vulnerability to trapping. Juvenile lynx may be more vulnerable to trapping than adult lynx and juveniles, if orphaned by their mother being killed in a trap, have been documented to starve to death.¹⁰³ Yet, according to MDIFW trapping records from radio-collared lynx, male lynx were determined to only be slightly more vulnerable to trapping than female lynx and juveniles were less vulnerable than adults.¹⁰⁴ Not surprising, the same holds true for orphaned lynx kittens and, in fact, kittens are even more likely to starve or otherwise perish since there is no chance that they could survive without the care/protection provided by their mothers.¹⁰⁵ Furthermore, as would be expected, starving lynx are more susceptible to trapping than lynx receiving adequate nutrition.¹⁰⁶ Even the MDIFW, in its own Canada Lynx fact sheet reports that “during periods of low prey availability, lynx will travel hundreds of miles” and that “forty percent of the lynx population can starve and litter size declines following a crash in the snowshoe hare population.”¹⁰⁷ Understanding the differential vulnerability of different segments of the lynx population (i.e., age and sex) to trapping is important for estimating future rates of lynx take along with lynx density, trapping effort, and types of take.¹⁰⁸

Though, as the DEA reveals, trappers in Maine may net, on average, only approximately 600 dollars in a year¹⁰⁹, it has been well documented that, as pelt prices increase, trapper

regulated trapping of other species overlaps with lynx habitat. Lynx may be more vulnerable to trapping near open roads” (Ruediger et al. 2000). Moreover, Maine's Comprehensive Wildlife Conservation Strategy states that trapping and illegal take are threats to lynx (DIFW 2005). In addition, in Maine there is no limit on the number of animals a trapper can take during a trapper season (for all species except marten), hence there are likely thousands of traps set by the 2,000-3,000+ licensed trappers (DIFW 2007a: 29). *See also Defenders of Wildlife v. Babbitt*, 958 F.Supp. at 681 (“Human activity results in the greatest mortality of lynx, principally through trapping.”).

¹⁰¹ Lynx are frequently re-captured in traps and snares. Mowat et al. (1994) demonstrate that recaptures of previously trapped lynx are common in a variety of trap types.

¹⁰² See *Animal Welfare Institute et al. v. Roland Martin*. Declaration of Camilla Fox. United States District Court, District of Maine, Case No. 1:08-cv-00267 citing pers. communication with Dr. Paul Paquet.

¹⁰³ ITP application/HCP at 60 citing Bailey 1986.

¹⁰⁴ ITP application/HCP at 41 citing MDIFW unpub data.

¹⁰⁵ ITP application/HCP at 41.

¹⁰⁶ ITP application/HCP at 42 citing Brand and Keith 1979.

¹⁰⁷ MDIFW (2003), Canada Lynx (*Lynx canadensis*).

¹⁰⁸ ITP application/HCP at 50.

¹⁰⁹ DEA at 65 citing AFWA 2005; trappers in the northeast have revenues of approximately \$1,587 while their expenses total \$924. Seventy eight percent of trappers surveyed reported that trapping was not at all important as a source of income.

numbers¹¹⁰ and activity escalates and the risks to lynx increase.¹¹¹ Though long term trends in trapper demographics indicate that trapping continues to decline in popularity and as to the number of participants, if there were a short term spike in numbers due to an increase in pelt prices, there is concern that this would correspond to an increase in the risk to lynx. To address this, the MDIFW claims that, based on its monitoring, if the number of land trappers increase in lynx range by more than 50 percent over a three year period or 10 or more lynx are captured incidentally in a single year, it will consult with the FWS and Maine Trappers Association to determine the best methods for lowering the incidental catch rate.¹¹² Such methods could include changes in trap regulations, bag limits, area restrictions, or permit only trapping.¹¹³ What's unclear is why the MDIFW has set the trigger for revisiting its trapping regulations so high (i.e., greater than 50% increase in land trappers, 10 or more lynx incidentally trapped). The precautionary principle would suggest that these triggers should be set lower to better anticipate a dangerous (for lynx) trend in trapper numbers or trapping rate.

Legal trapping activities for bobcat, coyote, marten, fisher and other furbearers in Maine create a potential for incidental capture of lynx.¹¹⁴ Incidental capture of lynx occurs wherever the species occurs and when recreational/commercial trapping is allowed. The very nature of trapping for furbearing animals is that it is inherently indiscriminate in terms of the species that are captured, regardless of the trapper's intent. Because lynx occupy similar habitat to that of other forest-dwelling furbearers, including bobcat, fox, coyote, marten, and fisher, they are particularly vulnerable during the trapping seasons for these species.

In Maine, between 1999 and 2010, 53 lynx were reported or determined to be trapped.¹¹⁵ This does not include another 7 lynx trapped during the 2011-12 trapping season in Maine. Of these 7 animals, one was killed as a result of being captured in Conibear trap while the remaining six lynx were released from foothold traps "with little to no signs of harm."¹¹⁶ Therefore, since 1999, a total of 60 lynx have been incidentally trapped, with at least seven

¹¹⁰ DEA at 65; trapper numbers increased from 1,700 in the mid-1970s to 3,345 in 1976 and peaked at 5,612 in 1980 in response to increasing pelt prices but since then the number of trapping licenses purchased has declined reflecting demographic, society, and outdoor recreation trends.

¹¹¹ ITP application/HCP at 44.

¹¹² ITP application/HCP at 137.

¹¹³ ITP application/HCP at 139.

¹¹⁴ 63 Fed. Reg. at 37006.

¹¹⁵ Lynx Research Coordination Meeting 5/14/07, MDIFW Bangor Headquarters - Update from Jennifer Vashon; *See also* EA at 2.

¹¹⁶ See Bangor Daily News, '1 lynx killed, 6 trapped as state waits for 'incidental take' permit', January 28, 2012.

trapped in Conibears which resulted in the death of 5 animals.¹¹⁷ Of the 53 lynx trapped between 1999 and 2010, 47 were trapped in foothold traps while 6 were captured in Conibear traps. DEA at 11. Of the 47 lynx incidentally caught in foothold traps, 75 percent were caught in traps set for fox and coyote involving No. 1.75 or No. 2 coil spring with scent lures and baits used to attract coyotes and fox to the trap.¹¹⁸ Of the six captured in Conibear traps, four died.¹¹⁹ With the exception of the four dead lynx incidentally captured using Conibear traps between 1999 and 2011¹²⁰, the DEA claims that MDIFW biologists and trappers released most incidentally caught lynx uninjured though some had lacerations, bruising, frozen toes, and other injuries.¹²¹

The reality, however, is that there is no credible evidence to document how many lynx are trapped, the sex and age of the trapped lynx, or the severity of the injuries of said lynx.¹²² Though state law requires trappers to report incidentally trapped lynx, level of compliance with this requirement is unknown.¹²³ While the state awards commendations for those who comply with this requirement, it is indisputable that a proportion of trappers trap lynx without ever filing a report. In 2003 and 2004, for example, a MDIFW game warden

¹¹⁷ Two additional lynx are known to have been killed due to trapping including a lynx illegally shot in a foothold trap and an injured lynx that was rehabilitated, released, but died within two weeks of release from starvation.

¹¹⁸ DEA at 12.

¹¹⁹ DEA at 34; It is unclear if the four lynx reported dead as a result of capture in Conibear traps includes a lynx captured in a Conibear trap in 2004 which was taken to a veterinarian for examination, rehabilitated for one week, released at the capture site and died two weeks later from starvation. See ITP/HCP at 59. More than likely this animal died as a result of being caught in the Conibear trap.

¹²⁰ This does not include the one lynx killed in a Conibear trap during the 2011 trapping season as reported in the Bangor Daily News on January 28, 2012. This incident remains under investigation by the MDIFW and, there, details of the incident including the size of the Conibear trap used, its placement, and other circumstances that contributed to this death have not yet been publicly disclosed.

¹²¹ DEA at 12; It would be more accurate to state that “biologists and/or trappers released most incidentally caught lynx...” since MDIFW biologists are not able to get to assist with the release of all incidentally caught lynx when reported. Indeed, based on the reported captures between 1999 and 2007, of the 40 captures that resulted in a lynx being released (2 of the captures resulted in dead lynx), 23 (57/5%) of the lynx were released by the trapper with no assistance by the MDIFW. Of these 23 trapper releases the injury assessment was “unknown” for 19 lynx and “none” for four lynx. Given these statistics and recognizing that the actual rate of take of lynx is entirely unknown, it is incorrect to suggest or intimate that most of the trapper/biologist released lynx were uninjured since the actual injury rate for incidentally caught lynx is unknown. Restricted or complete lack of blood flow to toes or a limb for even a limited amount of time can cause gangrene, but the condition is not evident until later.

¹²² DEA at 42, “it is unknown what fraction of lynx incidentally caught are reported. Without a high level of reporting, it will be impossible to assess take in the ITP. There is currently no information available to know whether reporting is high (>90%) or low (<10%).”

¹²³ ITP application/HCP at 69; MDIFW has established an objective to have biologists physically inspect greater than or equal to 90% of lynx incidental captures to collect info on trapping incident and condition of the animals. At present (based on past trap check statistics) MDIFW biologists haven’t been able to check even 50 percent of the incidental captures of lynx.

incidentally trapped a lynx both years and never reported either to the MDIFW.¹²⁴ While the reporting requirements were voluntary at that time, if a game warden is unwilling to report such takes this does not bode well for trappers reporting their incidental captures of lynx.

Furthermore, given the pervasiveness of the “shoot, shovel, and shut up” mentality among some hunters and trappers, it is inevitable that some trappers discover an injured or dead lynx in their trap, act pursuant to the shoot, shovel, and shut up mantra, and discard the carcass without filing a report due to the fear of potential prosecution or of triggering additional restrictions on trapping within lynx habitat. Indeed, not only has there been at least one report of an assistant trainer recommending the “shoot, shovel and shut up approach” at a MDIFW trapper training session but blog postings by trappers also have encouraged this unethical and illegal behavior.¹²⁵

This information is critical to the ITP application/HCP process, the analysis in the DEA, to proper management/regulation of trapping, and to understanding the true extent of the impact of incidental capture of lynx on the species in Maine. In particular, without accurate information on the number of female lynx trapped, there is no means of understanding the implications to the population and/or to develop a meaningful mitigation plan to compensate for female loss including the loss of kittens or other dependent young. Consequently, the current mitigation measure proposed by the MDIFW (*i.e.*, to create 5,000 acres of lynx habitat for the estimated lethal take of 5 lynx (2 adults and 3 kittens) over the 15 year duration of the plan is, at best, mere guesswork as to how many lynx will actually be lethally taken not to mention entirely failing to compensate for harm and harassment of take that doesn't result in mortality.¹²⁶ Though the reported take of lynx must inevitably be considered the minimal level of take, there is no evidence that the MDIFW has ever attempted, through study, random inspections, or surveys, to ascertain trapper compliance with its reporting requirement.

Similarly, though the reporting requirement is intended to provide, when possible, an opportunity for an MDIFW biologist to examine the trapped lynx, not all trapped lynx are examined before release by the trapper. For example, of the 42 lynx reported captured by trappers in Maine from 1999 through 2007, MDIFW biologists assisted with the release of only 16.¹²⁷ Of those 16 biologist assisted releases, nine lynx had “mild” injuries, four had

¹²⁴ See *Animal Welfare Institute et al. v. Roland Martin*. Stipulated Facts, United States District Court for the District of Maine, CV No. 08-cv-00267-JAW.

¹²⁵ See *Animal Welfare Institute et al. v. Roland Martin.*, Declaration of Daryl DeJoy, United States District Court, District of Maine, CV No. 1:08-cv-00267-JAW.

¹²⁶ Furthermore, if trapping is permitted on any mitigation lands this would undermine the entire purpose of creating this habitat and impose additional adverse impacts on lynx. Indeed, it is illogical to establish mitigation lands to compensate for incidental lynx mortality only to allow the activity on those mitigation lands (*i.e.*, trapping) that caused the mortality that required compensation.

¹²⁷ ITP application/HCP at 45-47.

no injuries, two has severe injuries, and the injury status of the final lynx was recorded as “unknown.”¹²⁸ Id. This means that 24 (excluding the two lynx reported as fatalities) animals were released by the trappers without biologist assistance. Not surprisingly, of these 24 lynx released by the trappers, 20 had “unknown” injuries and four had no reported injury at all. While this data demonstrates that MDIFW biologists are more likely to note an injury compared to a trapper, neither the MDIFW biologist nor the trapper likely have the expertise to determine the type or severity of injury to the trapped animal. While major injuries such as broken bones, major lacerations, maceration of muscle tissue, and amputations should be obvious to anyone, other injuries including joint luxations, toe fractures, freezing, broken teeth, restricted or no blood circulation to a toe or limb, tendon and ligament lacerations are more difficult to diagnose in the field and more likely to be missed. DEA at 32.

Unlike lynx incidentally caught by trappers which resulted in some reportedly experiencing mild or severe injuries, for lynx (65 animals) trapped by MDIFW biologist for research purposes, 80 percent were still alive at the end of 2007 or survived for at least six months after capture (suggesting a lack of indirect impact caused by exertion, stress, or myopathy in these animals) and 20 percent (13 lynx) died less than six months post capture from causes, according to MDIFW, unrelated to the capture event though the cause of death for each of these animals is not identified in the ITP application/HCP or in the DEA. Of the radio-collared lynx, six were subsequently caught by trappers. One suffered a broken leg due to being trapped, was rehabilitated, and lived for five more years after release.¹²⁹ For the remaining five, one lived for 20 months, one lived for 17 months, and three died within a month after release (with MDIFW attributed the deaths of these three animals to drowning in one case and, unconfirmed causes in the remaining two but with predation as a likely cause).¹³⁰ Id. Though the exact cause of death for the 13 lynx that did not die less than 6 months post capture and collaring by the MDIFW, these data demonstrate that MDIFW trapping of lynx for research purposes appear to be far less harmful to the lynx compared to incidental capture by trappers.

Ultimately, however, without credible data on the actual number of lynx being trapped incidentally in Maine and on the extent of injuries sustained, it is impossible to accurately assess the impact of trapping on the lynx population. Consequently, the MDIFW claim that

¹²⁸ ITP application/HCP at 45-47 and DEA at 31; In the DEA, citing to the same table in the ITP application/HCP, the FWS reports that of the 16 lynx released with the assistance of MDIFW biologists, 8 had no discernible injuries, 8 had mild injuries, and 2 had severe injuries. This is not consistent with the data in the ITP application/HCP.

¹²⁹ DEA at 17.

¹³⁰ DEA at 17; whether the death of these two animals due to predation versus as an indirect impact of their being incidentally trapped is open to question. A trap-related injury could certainly make it impossible or nearly impossible for the animal to hunt and/or limit the animal's ability to evade predators; both factors that could have led to the death of these animals and their subsequent predation by another animal.

Maine's lynx population can readily sustain this level of mortality (i.e., the mortality reported prior to 2007) is entirely fallacious.

As previously indicated, the two types of traps commonly used by commercial trappers in Maine that are of particular concern regarding threats to Canada lynx are the leghold trap and Conibear trap (also referred to as the body grip trap or generally as a kill trap). Although trappers in Maine attempt to use these traps selectively for these species, both types of traps are inherently non-discriminating. This unavoidably results in the accidental capture of lynx and other species. Despite the revised regulations intended to reduce incidental take of lynx, lynx in Maine have continued to be trapped in violation of the ESA – with at least eighteen additional incidental trapping incidents, including captures in Conibear traps. Since 2007 (i.e., after the Consent Decree resulting from a lawsuit filed to challenge the legality of trapping in lynx habitat in Maine). These incidental captures cause physical harm, stress related injuries, and deaths. Collectively, unintentional captures including those that are not reported, may adversely impact the lynx populations or localized subpopulations by altering demographics, reducing survival, affecting reproduction, increasing kitten mortality, and jeopardizing recovery. This is especially true in small populations such as that found in Maine.

Leghold traps pose a serious risk of injury to both target and non-target animals because they can capture unintended species. On land, leghold traps are most frequently set for bobcat, coyote, fox, raccoon, and other furbearing animals.¹³¹ Leghold traps are designed to catch the paw/leg and hold the target animal by the force of the instant compression of opposing jaws and remaining held in the trap until the trapper arrives and kills the animal. When an animal steps on the pan tension device, the trap jaws slam shut on the animal's foot, leg, or toes. Injuries can result from the clamping force of the trap's metal jaws onto the animal's limb and/or from the animal's struggle to escape - most animals react to the instant pain by frantically pulling against the trap in a desperate attempt to free themselves. Potential injuries include, but are not limited to, severe swelling, lacerations, joint dislocations, fractures, damage to teeth and gums, loss or disruption of blood circulation leading to gangrene, limb amputation, and death.¹³² Steel-jawed leghold traps, in particular,

¹³¹ Fox and Papouchis 2004.

¹³² Proulx 1999; Papouchis 2004; Here, not only are each of the routine foothold trapping events a prohibited "take" under section 9 via the "trap" and/or "capture" definitions of take, 16 U.S.C. §§ 1538(a)(1)(B), 1532(19) – which is alone sufficient to bring them within the section 9 prohibition and the section 10 ITP process – but the frequently resulting lacerations, bleeding, swelling, and other injuries also constitute "takes" under section 9 via the "wound" component of take. *Id.* at § 1532(19). Even further, because these conceded impacts "actually. . . injure wildlife," 50 C.F.R. § 17.3, they also implicate the "harm" mode of take. 16 U.S.C. §§ 1538(a)(1)(B), 1532(19). There is also evidence that some lynx trapping results in impacts to essential behavioral patterns, such as breeding, feeding, and sheltering, see *supra* at 10 & note 6, leading to additional "takes" through "harassment." 50 C.F.R. § 17.3. In addition, the legislative history of section 9 demonstrated that Congress intended to proscribe "take" in the "broadest possible manner to include every conceivable way in which a person can take or attempt to

have been shown to cause significant injuries for a number of commonly trapped species and most fail to meet basic trap standards.¹³³

The selectivity of any trap, including foothold traps, is, as disclosed in the DEA, affected by trapper experience, type of trap, trap modifications, manner in which the trap is set, location, selectivity of the device, trap size, the proportion of animals that are restrained by the trap without escape, and type of chain used.¹³⁴ Non-target species can, as is well established in the literature, be severely injured or frequently killed in foothold traps,¹³⁵ and those released alive may have impaired survival.¹³⁶

In scientific studies, incidental trapping of non-furbearers in foothold traps ranged from .12/furbearer (Berchielli and Tullar 1980) to 2.9/furbearer (Reynolds 1953, 1955, de Vos et al. 1959 as cited in Novak 1987).¹³⁷ In Maine, Litvaitis et al. (1983) incidentally caught a significant .81 non-furbearing species/furbearers.¹³⁸ Furthermore, according to a study published by the International Association of Fish and Wildlife Agencies in 2005, BMP studies of foothold traps in Maine, New York and Pennsylvania documented that 20 percent of animals trapped were non-furbearing animals.¹³⁹

Though the MDIFW has claimed that lynx incidentally caught in foothold traps set for canids generally can be released unharmed,¹⁴⁰ it has failed to provide any evidence to support this claim other than field reports from MDIFW biologists who have assisted with the release of incidentally captured lynx.¹⁴¹ This information is hardly convincing however, since MDIFW biologists, according to lynx trapping data from 1999 through 2007, only were able to inspect the captured lynx and assist with his/her release at 17 (47.5

take any fish or wildlife.” (S. Rep. No. 93-307, at 7 (1973)).

¹³³ Proulx 1999. Across the literature, the majority of studies show a significant percentage of trapped individuals suffering major injuries. If the criterion used is that 80% of individuals have nothing more than minor injuries, it is clear that both padded and unpadded leg-hold traps fail in this respect... What is clear is that 28/38 studies on leg-hold traps fall outside currently acceptable standards of welfare (e.g. Proulx 1999; Powell and Proulx 2003). Physiological studies demonstrate that they are more stressful than other capture techniques (Kreeger et al. 1990; White et al. 1991; Cross et al. 1999; Warburton et al. 1999).

¹³⁴ DEA at 85 citing Novak 1987, Powell and Proulx 1994, Turkowski et al. 1984, Shivik et al. 2005.

¹³⁵ DEA at 85 citing Onderka et al. 1990, Powell and Proulx 2003, Iossa et al. 2007, AVMA 2008.

¹³⁶ DEA at 85 citing Chapman et al. 1978.

¹³⁷ DEA at 85 though given changes in trap types and trapping methods over the past half-century, comparing historical trapping rates with modern rates must be done, if done at all, with caution.

¹³⁸ DEA at 85 citing Litvaitis 1984, Novak 1987.

¹³⁹ DEA at 85.

¹⁴⁰ MDIFW 2007b.

¹⁴¹ ITP application/HCP at 118, 288; MDIFW employees will respond on site to all reports of a captured lynx in a trap unless conditions are such that it would be unsafe for the animal to remain in the trap for the time it would take the employee to reach the site, it is dangerous for staff to travel to the site, a trapper has released the lynx because circumstance made it impossible for the trapper to contact the MDIFW and not jeopardize the welfare of the lynx, or it will take Department staff more than 4 hours to get to the site.

percent) of the 40 reported lynx captures. Even then, an MDIFW biologist does not have the training to accurately diagnose all potential injuries to a trapped lynx particularly since injuries can be subtle, masked by swelling, or require surgery or x-rays to accurately diagnose.¹⁴² For lynx caught in foothold traps set for marten or fisher, release without injury is unlikely.

In addition, if the trapping season permits the use of foothold traps into the colder winter months, the greater the danger of frozen digits or hypothermia for lynx. Consequently, if an elevated set for fisher or marten is made on a pole that a lynx could easily climb and the lynx is caught in the foothold trap, injury could result from the lynx falling off of the pole with a paw still caught in the trap, from frozen digits, or hypothermia.¹⁴³

It is well recognized that animals can incur debilitating bodily and mouth/teeth injuries while struggling to escape from a body-gripping trap and that such injuries may be correlated to how long an animal spends struggling in a trap.¹⁴⁴ Consequently, the existing 24 hour trap check time for foothold traps in Maine is far too long to avoid injury or even mortality of the trapped lynx under such a scenario. Indeed, in a study conducted in Montana, despite having protocols that require checking traps every 12 hours and closing them when temperatures were less than negative 8 degrees Celsius were expected, researchers encountered frozen feet and other injuries in some captured animals.¹⁴⁵ Given that Maine's prime trapping season for most furbearing animals extends into December,¹⁴⁶ average temperatures during that month, and the existing 24 hour foothold trap check times the potential for lynx to suffer from frozen digits is a legitimate and significant concern.¹⁴⁷ Indeed, in a study comparing three live capturing devices for lynx, it was determined that there was "... no way to reduce the risk of freezing with padded traps in sub-zero temperatures," and that the "risk of freezing precludes use of foothold traps for live-

¹⁴² See *Animal Welfare Institute v. Roland D. Martin*, Declaration of Paul Paquet, United States District Court District of Maine, Case No. 1:08-cv-00267.

¹⁴³ DIFW 2007b; Mowat et al. (1994) evaluated a variety of traps for capturing lynx including Tomahawk box traps and Victor padded leghold traps. With padded foothold traps, they found that thirty-nine percent [of captured lynx] had frozen toes or feet. Further, the authors state, "[w]e know of no way to reduce the risk of freezing with padded traps in sub-zero temperatures," and "[r]isk of freezing precludes use of foothold traps for live-trapping of lynx in winter." They conclude that foothold traps caused unacceptably high rates of frost damage to the foot when used in temperatures below 17° F. (Mowat et al. 1994).

¹⁴⁴ DEA at 48 citing Powell and Proulx 2003, Proulx et al 1994, Nocturnal Wildlife Research 2003. See also; MacPherson 1969, Englund 1982, Van Ballenberghe 1984, Keuhn et al. 1986, Kern et al. 1994, Hubert et al. 1997.

¹⁴⁵ Kolbe et al. 2003.

¹⁴⁶ In Maine, recreational fur trappers begin using leghold traps on land in mid-October, which is the beginning of the early coyote and fox trapping season (see http://maine.gov/ifw/hunting_trapping/trapping/trapping_dates.htm). In 2011 the early coyote/fox trapping season ran from October 16 to November 10. The statewide trapping season for bobcat, coyote, fisher, fox, marten, and other species, in 2011, started on October 30 and ended on December 31.

¹⁴⁷ ITP application/HCP at 35; See also Mowat et al. 1994 "we know of no way to reduce the risk of .

trapping of lynx in winter.” Based on their study, they conclude that “foothold traps caused unacceptably high rates of frost damage to the foot when used in temperatures below 17° F.¹⁴⁸

In addition, using a drag with foothold traps is common with fur trappers in Maine as it apparently allows trappers the convenience of checking trap lines from their vehicles.¹⁴⁹ Drags allow lynx to become tangled in brush which can result in significant injury, including fracture, of their legs.¹⁵⁰

Conibear traps pose a significant threat of mortality or injury for Canada lynx. MDIFW regulations still allow the use of Conibear traps under numerous circumstances.¹⁵¹ Intended to be an “instant killing” device, the Conibear trap is designed to snap shut in a scissor-like fashion on an animal's spinal column at the base of the skull, causing a fatal blow.

However, Conibear traps do not consistently kill target animals and they pose a significant threat to non-target species.¹⁵² In part, this is because when set for other species, they do not optimize the approach and ultimate positioning of lynx before the trap is released. Therefore, the unintentional capture of lynx with these traps usually results in slow death or severe and permanently debilitating injury, even if only a paw or leg is captured and held. Not surprisingly, as indicated above, of the 6 lynx incidentally trapped in Conibear traps in Maine between 1999 and 2010, at least four died. In addition, at least 7 lynx were captured during the 2011 trapping season with at least one being caught and killed in a Conibear trap.

The MDIFW repeatedly claims that the level of lynx mortalities associated with Maine's trapping program is too low to have a significant impact on the lynx population.¹⁵³ Unfortunately, this assertion is based on reported incidental takes of lynx and not actual takes and, based on the death of a lynx captured in a Conibear trap, the MDIFW may need to revisit its belief that legally set Conibear traps pose no risk to lynx. Though MDIFW reports that its experts have indicated that the leaning pole set of a Conibear trap consistent with Maine's regulations are highly effective in deterring lynx from investigating a baited trap, it concedes that there is “no guarantee that all lynx will respond the same way to

¹⁴⁸ Mowat et al. 1994.

¹⁴⁹ DEA at 81.

¹⁵⁰ ITP application/HCP at 37; MDIFW concedes that “an entangled chain may allow an animal to put sufficient strain on its leg to break it.” See also: Mowat et al. 1994.

¹⁵¹ Conibear traps with an inside jaw spread of five inches or less, which still enables the use of size 110 and 120 traps, may be used within lynx habitat (WMDs 1 – 11) on the ground as “blind sets” (without bait, lure of visible attractors). MDIFW 2008.

¹⁵² Gilbert 1981; Waller 1981; Proulx 1999; Novak 1987; Barrett et al. 1989; Proulx and Barrett 1993; Naylor and Novak 1994.

¹⁵³ ITP application/HCP at 119.

Conibears set on small diameter leaning poles.”¹⁵⁴ Indeed, the FWS, as it reports in the DEA, has examined the ability of lynx to ascend small diameter poles and has discovered that not only can they ascend poles that are placed at a greater than 45 degree angle but that they can also ascend vertical poles. This behavior, which apparently has been documented on videotape, should be sufficient to warrant, at a minimum, an immediate reevaluation of Maine’s Conibear trap rule and either a prohibition of setting upland/dryland Conibear traps in lynx occupied habitat in Maine, imposition of a requirement to use lynx excluding devices on all ground sets of Conibear traps, and/or a prohibition in the use of baits¹⁵⁵ in ground set Conibear traps.¹⁵⁶ Instead of demonstrating initiative on this matter, the MDIFW only offers to confer with the FWS and discuss the potential of modifying its Conibear rules if a lynx were to get caught in a Conibear trap.¹⁵⁷

The risk of mortality or serious injury is further exaggerated for lynx (and other species) incidentally caught in Conibear traps due to the presumption that animals caught in Conibear traps will die, resulting in trap check times of three to five-days in Maine depending on location.¹⁵⁸ For occupied lynx habitat, the Conibear trap check time is five days. This trap check time, which under any circumstance is entirely unacceptable, is intended to provide a level of convenience for trappers who work or go to school during the week and are only able to check traps effectively on weekends.¹⁵⁹ Significant injuries, if not death, are probable for any animal, including lynx, subject to restraint in a Conibear trap for days on end. Even if the animal were to miraculously survive without significant physical injuries (i.e., frostbite to toes, paws, limbs, dislocated joints, broken bones, torn ligaments and tendons, indirect effects including exposure to the elements, stress) lack of nourishment may adversely impact the animal, including causing death, if the animal is released.

Even apparently minor injuries assessed at the time of non-target species release may result in lameness which, directly through increased risk of predation or indirectly through reduced ability to hunt/find food in combination with possible stress of capture, can

¹⁵⁴ ITP application/HCP at 138.

¹⁵⁵ ITP application/HCP at 242; Bait does not include animal droppings (scat), urine or animals, dead or alive, held in a trap as the result of lawful trapping activity.

¹⁵⁶ According to the MDIFW 2011 Trapping Regulations and Recommendations to Avoid Lynx Capture, lynx exclusion devices are required in WMDs 7, 14, 18, and 19 though this mandate is not reflected in MDIFW’s Official 2011-12 State of Maine Hunting & Trapping Laws and Rules. Furthermore, though the MDIFW claims that baits are no longer allowed to be used on ground set Conibear traps (ITP application/HCP at 38), this too is not reflected in the official 2011-12 hunting and trapping laws and rules.

¹⁵⁷ ITP application/HCP at 139. In a separate offer, the MDIFW indicated it would confer with the FWS over potential change in Maine’s Conibear trapping regulations if any lynx was caught in a legally set Conibear trap or if two lynx were severely injured in such traps. The basis for requiring two lynx (versus one) to be severely injured in Conibear traps before MDIFW would confer with the FWS is unknown but disconcerting since the MDIFW should be striving to eliminate such incidents.

¹⁵⁸ MDIFW 2008.

¹⁵⁹ If this is the case, then, as the FWS reports in the DEA, the required 5 day check time for Conibear traps in unorganized towns is actually a 6 or 7 day check time.

significantly reduce the likelihood of survival¹⁶⁰ with death, if it happens, potentially occurring weeks or months later.¹⁶¹ In particular, predators released with internal trap injuries to feet, limbs, teeth, or other body parts may be so severely injured that they are unable to survive in the wild due to their physiology and the methods by which they obtain food.¹⁶² Lynx and other carnivores may suffer from broken teeth (from biting on the trap), which has been linked to the inability to catch wild prey.¹⁶³ Claw loss may also impact subsequent ability to catch prey.¹⁶⁴ In 2004, as reported by the MDIFW in its ITP application/HCP, a lynx captured in a Conibear trap was examined by a veterinarian due to some foot swelling, subject to one week of rehabilitation, released at the capture site but was found dead of starvation two weeks later.¹⁶⁵ Though MDIFW does not link this mortality directly to the fact that the animal was trapped, it is an unavoidable conclusion given the circumstances that caused the animal's death.

There are also substantial behavioral and physiological responses for animals caught in traps.¹⁶⁶ Accordingly, three major long-term and adverse effects are likely to result from capture and handling of lynx: (1) decreased mobility; (2) compromised age specific body condition; and (3) abnormal serum concentrations of muscle enzymes (AST and CK) from muscle injury and exertional myopathy. Though the capture and release of non-target animals does not always result in death, any injury or disfigurement may affect an animal's ability to survive, and significant capture-related effects may go undetected, providing a false sense of the welfare of released animals.¹⁶⁷ Capture myopathy is a stress-induced condition in animals – including in some carnivore species -- that frequently occurs following prolonged capture or chase and can result in skeletal and cardiac muscle damage, depression, anorexia, shock.¹⁶⁸ The combination of fear and anxiety accompanied by muscle exertion can cause wild animals to die hours, days, weeks or months after capture and release. The scientific literature is replete with studies, including those cited in the DEA, which demonstrate how the trauma of being caught in a trap can alter the behavior of released animals, reduce survival rates and disrupt the social dynamics of territorial species.¹⁶⁹

¹⁶⁰ DEA at 31, 33 citing Seddon et al. 1999, AVMA 2008.

¹⁶¹ DEA at 17.

¹⁶² Van Ballenberghe 1984.

¹⁶³ Patterson et al. 2003.

¹⁶⁴ Lossa et al. 2007.

¹⁶⁵ ITP application/HCP at 59.

¹⁶⁶ Van Ballenberghe 1984; Kreeger et al. 1990; Proulx and Barrett 1993; Mowat et al. 1994; Seddon et al. 1999; Warburton et al. 1999; Powell and Proulx 2003; Iossa et al. 2007; Cattet et al. 2008.

¹⁶⁷ Cattet et al. 2008; *see also* Draft EA at 17 (“Non-lethal take from incidental trapping in the form of ‘harm’ or ‘harassment’ may have short- and long-term effects on the behavior, survival, and breeding of lynx.”).

¹⁶⁸ DEA at 33 citing Little et al. 1998, Hartup et al. 1999, Arnemo et al. 2007, and Cattet et al. 2008.

¹⁶⁹ DEA at 33 citing Redig 1981; Proulx 1999; Seddon et al. 1999; Powell and Proulx 2003; Fox 2004a; Fox 2004b; Iossa et al. 2007; Cattet et al. 2008; Hornocker and Hash 1981; Banci and Proulx 1999; Fox 2004b.

The potential for the incidental trapping of lynx in Maine is elevated as a result of the use of bait, including lures and scents, to attract canids, felids and mustelids to traps. Baits, lures and scents (including urine and scat) used to attract target species to traps are also attractive to lynx. MDIFW regulations allow for pre-baiting and baiting of trap sets, with some restrictions. Specifically, under existing MDIFW regulations, foothold and killer-type traps must not be set within 50 yards of bait that is visible from above yet bait may be used for trapping only if it is completely covered to prevent it from being seen from above, and in such a way as to prevent wind action and other normal environmental conditions from exposing the bait. Consequently, it is still legal to use bait that is covered and not “visible from above” directly on or next to trap sets (e.g., for fisher, marten, coyote, fox) which poses a significant hazard to lynx. In 2007, for example, all eight of the traps in which lynx were caught used bait. Furthermore, MDIFW trapping regulations contain no restriction on the use of lures, urine, or other scents that may attract lynx to traps set for other species.

While the incidental trapping of any lynx is cause for concern (and represents an illegal take under the ESA), the incidental trapping of female lynx is particularly grave because it not only removes a potential breeding individual or lactating mother from the population but any orphaned kittens will also likely die.¹⁷⁰ In addition, if any kittens are trapped and, consequently, separated from their mothers, they may not survive when released from the trap.¹⁷¹

While the threats posed by trapping are of utmost concern, they are not the only threats to lynx. Habitat loss, degradation, and fragmentation caused by both anthropogenic and natural factors pose a considerable threat to lynx in Maine and throughout the species’ range. As previously indicated, the DEA provides rather dire predictions as to the long-term prospects of lynx in Maine reporting that populations will likely decline in the near future (5 to 20) years, that lynx habitat will shift southward where lynx will encounter greater inter-specific competition with bobcats and fisher while being at greater risk due to reduced snow accumulations, that lynx density will decline by 65 percent if current silviculture trends continue, and that, even under the best of scenarios, lynx density may still decline by 55 percent by 2032.¹⁷² These trends not only adversely affect lynx directly but will negatively impact snowshoe hares thereby impacting lynx indirectly. Indeed, though the MDIFW examined the impact of trapping on lynx, including its use of a population model, based on data reflecting ideal conditions causing a peak in the lynx population, the DEA contemplates a worst case scenario when hare densities are low. As a result, the FWS reports that landscapes needed to support lynx home ranges in Maine may need to be considerably larger in the future, and in some areas landscape hare density may decline to a point no longer able to support lynx.¹⁷³

¹⁷⁰ 63 Fed. Reg. at 37003.

¹⁷¹ 63 Fed. Reg. at 37003.

¹⁷² DEA at 7 citing Simons 2009.

¹⁷³ DEA at 7 citing Simons 2009.

In sum, lynx are sensitive to a variety of environmental variables and anthropogenic impacts. Their survival is closely linked to the availability of specific forest habitat types, an adequate prey base (primarily snowshoe hare), adequate snowfall levels,¹⁷⁴ and the prevention and/or strict regulations on adverse anthropogenic impacts and stressors (i.e., illegal and incidental trapping, poaching, excessive disturbance due to recreational activities). While some of these factors (i.e., incidental trapping, silviculture treatments) are entirely within our control, others including climate change (discussed in more detail below) cannot be remedied by the FWS through this decision-making process. As a consequence, it is imperative that the FWS take actions to restrict or control the factors or threats that are within its purview to affect (e.g., by eliminating upland, dryland trapping in lynx occupied habitat in Maine or by imposing significant restrictions on trapping activities in lynx habitat as to minimize the potential for the incidental take of lynx).

Furthermore, anthropogenic impacts (direct and indirect including legal, illegal, and incidental trapping as well as adverse effects to habitat quantity and quality) are the most important source of mortality for Canada lynx populations.¹⁷⁵ Evidence from northern areas in the U.S. indicates that when lynx densities are low, human-caused mortality is additive to natural mortality and thus incidental or illegal killing, under certain circumstance, can even more significantly affect lynx population dynamics.¹⁷⁶ Even the MDIFW recognizes this threat in its ITP application/HCP in which it reports that “when a population is reduced or has high rates of natural mortality (e.g., lynx starving when hare populations crash), high levels of human related mortalities may depress the recovery of a population.”¹⁷⁷ The collective effect of these direct and indirect impacts, including direct exploitation through trapping (even if incidental), can lead to an “extinction vortex” for lynx in the Northeast, including Maine¹⁷⁸ potentially causing local or regional extirpation of the species. As explained by Carroll (2005):

Habitat for these species at the southern limits of their range is already fragmented by climate and human associated factors such as conversion of forest to farmland and urban areas. Because of the small and semi-isolated carnivore populations of the region, climate change can interact with habitat conversion and direct exploitation (trapping) to form an “extinction vortex,” that may affect both

¹⁷⁴ Murray et al. 2008; Vashon et al. 2008; Carroll 2007; Hoving et al. 2005; Hoving et al. 2004.

¹⁷⁵ Ward and Krebs 1985; 63 Fed. Reg. at 37003.

¹⁷⁶ Ruggiero et al. 2000.

¹⁷⁷ MDIFW 2007a.

¹⁷⁸ Carroll 2005; “Habitat for these species at the southern limits of their range is already fragmented by climate and human associated factors such as conversion of forest to farmland and urban areas. Because of the small and semi-isolated carnivore populations of the region, climate change can interact with habitat conversion and direct exploitation (trapping) to form an “extinction vortex” that may affect both regionally scarce species such as the lynx and relatively abundant species such as the marten.”

regionally scarce species such as the lynx and relatively abundant species such as the marten.

NEPA Analysis:

DEA Analysis & Recommendations:

In evaluating any project under NEPA, an agency must include several specific components including a purpose and need statement, a range of reasonable alternatives, a description of the affected environment, an analysis of the environmental consequences of the action and any alternatives, and an assessment of the cumulative impacts of the action. Because the document being reviewed is an ITP application/HCP, the FWS must also ensure that the document is in compliance with the relevant ESA requirements. These requirements, which must be met as a prerequisite to receiving an ITP, specify that the applicant, in its HCP, must specify “(i) the impact that will likely result from such taking; (ii) what steps the applicant will take to minimize and mitigate such impacts, and the funding that will be available to implement such steps; (iii) what alternative actions to such taking the applicant considered and the reasons why such alternatives are not being utilized; and (iv) such other measures that the Secretary may require as being necessary or appropriate for purposes of the plan.”¹⁷⁹

Furthermore, in the DEA the FWS explicitly seeks additional information in response to the following questions:

- Did we review and appropriate list of feasible or practicable alternatives and conservation measures?
- Is there additional information that would help assess the effectiveness of the conservation measure proposed under the 4 alternatives?
- Are there additional feasible or practicable conservation measures that we should consider?
- Is there additional information that could better inform this environmental assessment?
- Have we appropriately anticipated the direct, indirect, and cumulative environmental effects of the various alternatives?

Throughout the remainder of this comment letter all of these issues and questions will be addressed and, where appropriate, specific recommendations will be made. While this will be done under the headings of “NEPA Analysis,” “Compliance with ITP/HCP Standards,” and “Response to FWS Questions” there is obvious overlap among these categories which should be considered while reviewing these comments. These recommendations will duplicate some of the recommendations identified in the opening section of this letter but others will be new and unique to the issue being addressed.

¹⁷⁹ 16 U.S.C. § 1539(a)(2)(A).

Consideration of a range of reasonable alternatives:

The FWS has evaluated five alternatives in the DEA (Alternatives A through E). Alternative E, which would prohibit all upland, dryland trapping WMDs 1-11, 14, 18, and 19 (current lynx occupied range in Maine) is clearly the alternative that is most consistent with the legal requirements imposed by the ESA to avoid “take” of protected species. As such, AWI and PC strongly endorse this alternative and encourage the FWS to select it as its preferred alternative in its Final EA and FONSI and mandate such a prohibition in the ITP provided to the MDIFW.

Though, given the requirements of NEPA and Section 10 of the ESA, it is clear that the current ITP application/HCP is woefully inadequate and that an EIS is clearly required to evaluate the impacts of this proposed action, if the FWS selected Alternative E as its preferred alternative there would be no need to engage in further decision-making on this subject until the ITP nears expiration. If the FWS does not select Alternative E, then it must, as articulated previously, reject the current ITP application/HCP as deficient, request a substantive revision from the MDIFW, terminate the current planning process, and commit to the preparation of an EIS upon receipt of the revised document. In addition, under such a scenario, the FWS should make clear to the MDIFW and individual trappers that without an ITP any incidental capture of a lynx would violate the ESA and those responsible may be subject to prosecution. As indicated previously, one other option that would be supplementary to this finding (i.e., need for a revised document and commitment to prepare an EIS) is the possibility of issuing an interim ITP containing substantive restrictions on trapping activities within lynx occupied range in order to reduce the incidental take of the species and to require habitat mitigation as compensation for any takes. Such a decision, while not entirely consistent with the letter of the ESA, would create a situation where the MDIFW was much closer to full compliance with the law than is presently the case.

Alternative A is the “status quo” alternative and, therefore, is unacceptable since the current situation continues to permit the illegal, incidental take of lynx in Maine. Alternative B, though it would result in greater coordination with trappers and their allied organizations, would increase trapper education/training activities, would improve and increase surveys of lynx and their habitat, and would include mitigation measures to create 5,000 acres of habitat to compensate for the estimated take of lynx during the duration of the ITP, it does not provide the amount of substantive change needed in MDIFW’s trapping program to protect the state’s lynx population, to promote recovery, and to comply with other mandates of the ESA.

Alternatives C and D would impose additional restrictions¹⁸⁰ on Maine trappers that would likely reduce, to some extent, the incidental take of lynx. Many of these restrictions are

¹⁸⁰ For example, requiring conibear exclusion devices (Alternative C), limiting the size of conibear traps permitted (Alternative D), requiring a 24 hour trap check time for conibear traps (Alternative D), requiring immediate use of BMP traps and pan tension devices (Alternative D), phasing in use of BMP traps (Alternative C), eliminating drags (Alternative C), reducing length of trapping season (Alternative D), increased enforcement and penalties (Alternatives C and D), requiring preparation of trapper training DVD

entirely appropriate (assuming Alternative E is not selected) but the combinations of restrictions must be amended to maximize protections for lynx and to best comply with the requirements of the ESA. As the FWS is aware, it is not obligated through this NEPA process to pick any of the evaluated alternatives and, in fact, it can combine elements from two or more alternatives to identify a preferred action. Such a “sixth” alternative if created should, at a minimum, contain the 10,000 acre habitat mitigation measure (with any habitat manipulation done using least impactful methods that balance needs of snowshoe hare/lynx with other species and with imposition of a no trapping policy for said lands), the creation of a trapper training DVD, a prohibition on the use of Conibear traps, a reduction in the length of the trapping season, a requirement to use stakes, swivels, short chains, and pan tension devices, the elimination of drags, increased enforcement efforts and penalties, improved and increased lynx and lynx habitat surveys, veterinarian review of MDIFW injury assessment protocol, and a requirement that veterinarians inspect all trapped lynx if logistically feasible and conducted in a timely manner. Nevertheless, even this “sixth” alternative would fall short of containing all relevant and appropriate restrictions since, for example, it would not require all trappers to take a trapper education course or any refresher course, it would not adequately assess trapper compliance with mandatory reporting rules for trapped lynx, does not require reporting of non-target capture of other species including federally protected migratory birds¹⁸¹, and would not address the use of bait (including scents) when setting traps in lynx occupied range. If the FWS could incorporate these additional items into a preferred alternative then it may have an option that, while not as restrictive as Alternative E, would be far more compliant with ESA mandates than is presently the case.

It is worth noting that, in this DEA, the FWS has not identified a preferred alternative. While this is not required in an EA, had the FWS done so it would have aided the public in understanding which Alternative was, at least preliminarily (prior to public comment) was most compelling to the FWS. More than likely, the FWS elected not to select or identify a preferred alternative in this case due to the significant deficiencies in the ITP application/HCP that it identified in the DEA.

Analysis of Environmental Consequences:

The simplest way to describe the intent of NEPA is that it requires federal agencies to “look before they leap.” In other words, a federal agency must evaluate the environmental impacts of any proposed action before implementing that action. The Council on Environmental Quality regulations implementing NEPA, to which all federal agencies must comply, mandate that

(Alternatives C and D), requiring veterinarian inspection of some trapped lynx (Alternative C), requiring veterinarian inspection of all trapped lynx (Alternative D), increased lynx population and habitat surveys (Alternatives C and D), and habitat mitigation (Alternative C – 10,000 acres) and Alternative D – 7,000 acres).

¹⁸¹ Ideally, the FWS should require that MDIFW mandate trappers to report the capture of any non-target species so that both it and the MDIFW can understand the scope of this impact and reform trapping policies to try to minimize such captures. At a minimum, however, FWS must require that MDIFW mandate the reporting of federally protected species such as migratory birds and ESA listed candidate species.

“NEPA procedures must insure that environmental information is available to public officials and citizens before decisions are made and before actions are taken.” 40 C.F.R. §1500.1(b). The regulations also mandate that “the information must be of high quality” and that “accurate scientific analysis, expert agency comments, and public scrutiny are essential to implementing NEPA.” *Id.*

The DEA, as presently written, does not satisfy these basic standards of NEPA. Not only are there substantive issues not addressed or adequately addressed in the DEA (see below), but even the information disclosed in the DEA is incomplete which, in turn, means that the analysis is also incomplete and deficient.

This is not entirely the fault of the FWS. Indeed, considering the significant deficiencies in the MDIFW ITP application/HCP – many of which were identified, disclosed and discussed by the FWS in the DEA – the FWS was placed into a predicament where it had no choice but to prepare and publish a legally insufficient DEA. A significant factor contributing to this problem was the fact that the MDIFW ITP application/HCP is over three years old. Consequently, though the FWS attempted to provide updated information in the DEA which it was legally obligated to do (though it should have required the MDIFW to update its ITP application/HCP prior to publishing the draft EA), there remain gaps in the plan that only the MDIFW can potentially fill.¹⁸² These include, but are not limited to:

- Lack of information regarding what is contained in forestry Best Management Practices, how many landowners are likely to use them, and when and where habitat will be created that minimize or mitigates incidental take of lynx;
- Mitigation proposed to establish 5,000 acres of lynx habitat on MBPL habitat does not identify the location, habitat quality, use restrictions, permanence, enforceability, development of a management plan, and binding nature of legal mechanisms used to create an area protective of lynx and its habitat;
- Failure to mitigate for other forms of take of lynx from trapping including from harm, harassment or wounding;
- Lack of an active management plan for Canada lynx on lands administered by the MBPL despite existing policies requiring such a plan;
- Failure to address the likelihood of deteriorating habitat quality and/or fluctuating hare numbers;
- Lack of detail as to the nature of conservation agreements with forest landowners and/or the benefits of said agreements to lynx;

¹⁸² Nevertheless, it is ultimately the FWS that is responsible for compliance with NEPA and, hence, the deficiencies inherent to the MDIFW’s ITP application/HCP do not exonerate the FWS from fully complying with the law.

- Reference to the Lynx Conservation Strategy as a tool to aid in the monitoring of lynx populations every five years since the Maine Forest Products Council annulled the agreement upon the designation of critical habitat for lynx;
- Insufficient information to assess the rate reporting of incidental captures of lynx making it impossible to assess take in the ITP application;
- Lack of detail as to the timing of when lynx habitat is created, failure to mandate the use of forest management standards contained in the FWS Canada Lynx Habitat Management Guidelines for Maine, and no requirement to demonstrate that an adequate amount of new lynx habitat will be created – above the current baseline – to compensate for all forms of take anticipated from trapping;
- Failure to provide details of the location of mitigation lands, associated roads, etc. prevents an assessment of whether mitigation measures will cause adverse effect to historic properties;
- Failure to include measures to monitor or to report take of migratory birds and other non-furbearer species, to include an adaptive management plan to address take of migratory birds, or to demonstrate that take of migratory birds and bald and golden eagles by trapping has been adequately addressed or otherwise permitted to ensure that its trapping program is “an otherwise lawful activity”;
- Lack of specific data on incidental take of non-target animals (including eagles, migratory birds, snowshoe hares) from trapping (species caught, numbers caught, types of traps) making it impossible to quantify and predict short and long-term effects to select alternatives in terms of how non-target species will be affected (positively or negatively), how much incidental take could be avoided, and what the direct and indirect effects of these improvements would have on ecosystems;
- Lack of a reliable estimate of the size of the lynx population in Maine and the uncertainty and lack of statistical confidence limits with recent estimates;
- Failure to base the ITP application/HCP on the best available scientific evidence as required by the ESA;

In addition, though substantive lynx research activities apparently ended in 2010, analysis of the relevant data is ongoing by MDIFW scientists in collaboration with their colleagues and the University of Maine. Yet, the results of these analyses, even if only preliminary, are not included in the DEA.

These deficiencies (some of which are discussed in greater detail below) provide sufficient grounds, independent of any other legal inadequacies, for the termination of the current planning process. While the Final EA can theoretically be used as a mechanism to remedy

these deficiencies, the requisite changes in the document would be so substantive that the FWS, at a minimum, would have to prepare a supplemental EA (but preferably an EIS) and provide another opportunity for public comment.

As indicated above, there are some important issues relevant to lynx management in Maine (and elsewhere) that are not addressed or are inadequately addressed in the DEA.

Recreation impacts on lynx and lynx habitat:

Foremost among those issues was the lack of any discussion of the impact of human activities, particularly recreational activities, on lynx. The DEA provides some discussion of trapper impact on lynx in regard to disturbance separate from incidental take, but it entirely ignores other seasonal recreational pursuits. During non-winter seasons in northern Maine, presumably the aesthetics of the area attract hikers, bicyclists, and off-road vehicle users (among others) to lynx occupied habitat. Depending on numbers, density, areas of use it is indisputable, even though lynx may be most active at night or during crepuscular periods, that these activities can impact the species, their movements, denning habitats, habitat use patterns, and predator/prey relationships. Since impacts of such activities can represent a cumulative impact to lynx, this should have been addressed in the MDIFW ITP application/HCP and, subsequently in the DEA.

A larger potential impact is the effect of winter recreation (i.e., snowmobiling, skiing, snowshoeing) on lynx and their habitat. Though such activities may mainly occur during the day while lynx are more active at night, this does not minimize the potential impacts. In particular, concerns have been identified in the scientific literature about the impact of packed, groomed, or user created snowmobile trails or roads on lynx due to the potential for coyote and bobcat¹⁸³ to use said trails as corridors to access snowshoe hare and lynx occupied habitats that they may not have been able to physically access without the aid of the trails/roads. Physiologically, with large, soft paws, lynx are more capable of traversing deep snow than bobcat, coyote, and most other species. This provides them with the opportunity to occupy a select niche that can't be easily occupied by coyotes or bobcats which limits lynx competition with those species for snowshoe hare. With the availability and accessibility of packed/groomed trails/roads, bobcat and coyote can more easily access lynx habitat and compete with lynx for food thereby potentially adversely impacting lynx demographics, survival, habitat use patterns, and overall ecology.

Snowmobiling is a popular pastime in Maine. According to the website www.mainesnowmobiling.com, there are 265 snowmobiling clubs in Maine affiliated with the Maine Snowmobile Association. Within Maine, the Interconnecting Trail System (ITS)

¹⁸³ As reported by the MDIFW in its ITP application/HCP that, in addition to competition between lynx and bobcat over prey and habitat, bobcat may also limit the range of lynx by hybridizing with them. ITP/HCP at 25. There reportedly have been several lynx-bobcat hybrids found where the ranges of the two species overlap. *Id.* citing Homyack et al. 2008).

encompasses the entire state and includes 2,500 miles of main trails.¹⁸⁴ In total a fact sheet available on www.mainesnowmobiling.com indicates that Maine has more than 12,000 miles of groomed ITS and club trails though, according to the Maine Snowmobile Association website, the trail system has now grown to over 14,000 miles of groomed and marked trails¹⁸⁵ which “interconnect communities from the suburbs of southern Maine, down east to the coastal plain, through the western and northwestern highlands and on to the farmlands and deep woods or northern Maine.”¹⁸⁶ The MSA trumpets that “tens of thousands of snowmobilers explore Maine's trails every winter, following this white ribbon of snow created by Maine Snowmobile Association (MSA) club members.”

In its 1999 report entitled ‘Ecology and Conservation of Lynx in the United States,’¹⁸⁷ the United States Forest Service raised concerns about the impacts of snowmobiling and the creation of compacted snowmobile trails on lynx. Specifically, it reported that:

Fragmentation of habitats occupied by lynx (including increased openings, higher road densities, exurban residential development, and wider use of snowmobiles and devices that compact snow in areas with deep, soft snow) is a plausible mechanism for the questionable conservation status of the lynx in the contiguous United States. Competition could take the form of exploitation by other predators of snowshoe hares, particularly the coyote, or involve interference competition, with larger-bodied carnivores acting aggressively toward lynx, even killing them. The coyote, because of its broad niche tolerances, high reproductive rate, and expanding range in the contiguous United States, is particularly suspect in competition.

Furthermore, in discussing the natural separation between lynx and its competitors, Ruggiero et al. (1999) report that:

...this separation may break down where human modifications to the environment increase access by coyotes to deep snow areas. Such modifications include expanded forest openings throughout the range of the lynx in which snow may be drifted, and increased snowmobile use in deep snow areas of western mountains. Recreational snowmobile use has expanded dramatically in the contiguous United States in the past 25 years, with hundreds of thousands of km of trails (>19,000 km of groomed trails in Maine alone) within the pre-settlement range of the lynx (Maine Snowmobile Association, World Wide Web site, Zesiger 1997).

¹⁸⁴ See <http://www.mainesnowmobiling.com/facts.htm>

¹⁸⁵ Effort to obtain a map of such trails from online sources to compare their location with occupied lynx habitat were not successful. Though the MBPL collaborated with the Maine Snowmobile Agency and others to compile the maps, they are only available for a small fee. Nevertheless, it is highly likely that hundreds of miles of snowmobiles trails traverse lynx occupied habitat in Maine.

¹⁸⁶ See <http://www.mesnow.com/>

¹⁸⁷ Ruggiero et al. 1999 available at http://www.fs.fed.us/rm/pubs/rmrs_gtr030.pdf

The following year, in its 'Canada Lynx Conservation Assessment and Strategy,'¹⁸⁸ the U.S. Forest Service provided additional information, including management, advice on how to minimize the impact of winter human recreational activities on lynx and lynx habitat. As explained in the document:

Lynx have evolved a competitive advantage in environments with deep soft snow that tends to exclude other predators during the middle of winter, a time when prey is most limiting (Murray and Boutin 1991, Livaitis 1992, Buskirk et al. 2000). Widespread human activity (snowshoeing, cross-country skiing, snowmobiling, snow cats) may lead to patterns of snow compaction that make it possible for competing predators such as coyotes and bobcats to occupy lynx habitat through the winter, reducing its value to and even possibly excluding lynx (Bider 1962, Ozoga and Harger 1966, Murray et al. 1995, O'Donoghue et al. 1998).

In the absence of such roads and trails, however, snow depths and snow conditions would normally limit the mobility of other predators, during midwinter months. To mitigate for this potential threat and to ensure that lynx maintained a competitive advantage over other predators, the U.S. Forest Service indicated that "it may be necessary to minimize or even preclude snow compacting activities in and around quality snowshoe hare habitat" and "to not do so may lead to the elimination of the lynx, or preclude the ability to re-establish them, in these landscapes."

The impacts of winter recreation on lynx is not limited to the indirect impact of compacted roads on lynx competition with other predators. Another related impact is that caused by winter-time human disturbance including large developed recreational sites or in areas of concentrated winter recreational use. The U.S. Forest Service report indicates that lynx may be able to adapt to the presence of regular and concentrated recreational use so long as critical habitat needs are being met and, hence, "it is essential that an interconnected network of foraging habitat be maintained that is not subjected to widespread human intervention or competition from other predator species. To compensate for potential impacts caused by concentrated recreational use, the U.S. Forest Service report recommends the provision of 'diurnal security habitat' for lynx which would include places in the landscape where lynx can bed during the day relatively undisturbed. Such diurnal security habitats should be "sufficiently large to provide effective and visual insulation from human activity," "be well distributed and in proximity to foraging habitat," and "be protected from actions or activities that would destroy or compromise their functional value."¹⁸⁹ Furthermore, "minimizing disturbance around denning habitat is important from May to August."

¹⁸⁸ Ruediger et al. (2000) available at www.fs.fed.us/r1/wildlife/carnivore/Lynx/lcas.pdf

¹⁸⁹ Ruediger et al. (2000)

Despite these concerns about the impact of winter use, including compacted snowmobile roads and trails, on lynx, there hasn't been extensive research done to understand the severity of such impacts or to develop strategies for mitigation. One study, conducted in the Uinta Mountain Range of northeastern Utah, found that snowmobile trail presence is a good predictor of coyote activity in deep snow areas with over 90 percent of coyote tracks found in the study area within 350 meters of a trail prompting the authors to recommend restrictions on snowmobiles in lynx conservation areas due the potential of inter-specific competition with coyotes.¹⁹⁰ Yet, another study, conducted in western Montana and published in 2007, did not find a significant affect of packed or groomed snowmobile trails on the movement of coyotes in the winter.¹⁹¹ It is unknown if any studies of this issue have occurred in the northeastern United States or, specifically, in Maine.

The MDIFW and FWS erred in not disclosing information about recreation, particularly winter recreation, impacts to lynx in the ITP application/HCP and DEA, respectively. Since this clearly is a factor that is relevant to lynx management in Maine and that can adversely impact lynx, it cannot be ignored.

Take of non-target species including federally protected migratory birds:

The DEA provides considerable information on the non-selectivity of trapping and the resulting take of non-target species. While there are a variety of variables that can increase or decrease the likelihood of trapping non-target species, a variety of studies have made clear that the impact of said trapping can be significant in terms of both numbers of non-target animals trapped and the pain and suffering that they endure. Historically, non-target foothold trap incidental capture rates were determined to be 2.0/furbearer (2 non-target species trapped for every target furbearer trapped)¹⁹² while, more recently, incidental trapping rates for non-target species ranged from .12/furbearer in New York to .81 non-furbearing species/furbearers in Maine.¹⁹³ For Conibear traps, incidental trapping rates for non-target species included .54/furbearer, .68/furbearer, and .74/furbearer.¹⁹⁴

The species captured as non-targets include porcupines, snowshoe hares, red and flying squirrels, and gray jays, boreal and hawk owls, domestic pets, crows, ravens, blue jays, hawks, eagles, waterfowl.¹⁹⁵ Porcupines, snowshoe hare, red and flying squirrels and gray jays were most the most commonly caught non-target species in boreal habitats but saw,

¹⁹⁰ Bunnell et al. (2006)

¹⁹¹ Kolbe et al. (2007)

¹⁹² DEA at 85 citing Reynolds 1953, 1955, de Vos et al. 1959 as reported in Novak 1987 though, as reported in the DEA, traps and trapping methods have changed in the past 50 years so comparing historical data to recent data should only be done with caution.

¹⁹³ DEA at 85 citing Berchielli and Tullar 1980 and Litvaitis et al. 1983.

¹⁹⁴ DEA at 86 citing Proulx and Barret 1993, Barrett et al. 1989, and Naylor and Novak 1994.

¹⁹⁵ DEA at 86 citing Litvaitis 1984, Novak 1987, Barrett et al. 1989, Proulx et al. 1989, Mowat et al. 1994, Naylor and Novak 1994.

whet, boreal, and hawk owls and domestic animals were also captured.¹⁹⁶ In New Brunswick, Canada, crows, gray jays, ravens and blue jays were frequently taken in foothold traps, with hawks, owls and eagles caught less often, and waterfowl caught infrequently in aquatic sets.¹⁹⁷ In Maine, while trapping for bobcat in eastern Maine, Litvaitis et al. (1983) incidentally caught 88 non-furbearing animals in foothold traps including 52 porcupines, 19 snowshoe hares, 7 crows and ravens, 2 squirrels, 3 domestic dogs and cats, and 5 miscellaneous birds.

In upland setting in Maine, it is anticipated that non-target animals potentially subject to capture in traps include gray jays, blue jays, ravens, crows, owls (though less frequently), hawks, bald and golden eagles, northern flying squirrels, snowshoe hares, and porcupines.¹⁹⁸ Based on non-target species trap rates (low and high) documented in the literature, it is estimated that between 6,000 and 32,400 non-furbearing animals could be taken annually in Maine; a substantial number particularly since it may be an underestimate and since there is no means of assessing the impact of such non-target takes on species populations.

In Maine, if a non-target furbearer is trapped incidentally, and found dead, it must be reported to the MDIFW. For non-furbearer species, MDIFW does not require any reporting of incidental capture and, consequently, the number and species composition of non-furbearer species caught and the proportion of non-furbearer animals released alive, injured or that die in traps in Maine is unknown. This prevents any assessment of the effects of trapping on non-target wildlife populations.

The FWS, through the issuance of the requested ITP which is to have statewide applicability, has, and should exercise, the ability to require the MDIFW to reform aspects of its trapping program that it likely would not change on its own. In particular, as previously requested in this letter, the FWS should require the MDIFW to require the reporting of all non-target species caught in traps so that the data can be analyzed and efforts made to reduce these takes and to prevent pain and suffering experienced by the non-target victims. It is disappointing that such a recommendation would even be necessary since, ideally, the MDIFW should recognize the value to collecting data on the trapping of non-target species in order to, in collaboration with trappers and their allied organizations, work to reduce such captures.

The FWS does, however, have authority and management responsibility for federally protected species. This would include species listed under the ESA, federal candidate species awaiting listing under the ESA, migratory birds including, but not limited to, bald

¹⁹⁶ DEA at 86 citing Litvaitis 1984, Novak 1987, Barrett et al. 1989, Proulx et al. 1989, Mowat et al. 1994, Naylor and Novak 1994.

¹⁹⁷ DEA at 86 citing Stoczek and Cartwright 1985.

¹⁹⁸ DEA at 87.

and golden eagles. As indicated in the DEA, since 1971, 38 bald eagles and 1 golden eagle have been documented as incidentally trapping in Maine with both species injured and killed in both Conibear and foothold traps.¹⁹⁹ The majority of these captures occurred prior to recent regulatory changes which mandated that baited traps be covered so to not be visible to birds and that traps must be set back 50 yards or more from a carcass to protect eagles.²⁰⁰ However, at least two eagles were trapped after the 2007 regulations were implemented, possibly, as reported by the FWS, in illegally set traps. While the new regulations have diminished the likelihood that eagles may be incidentally caught in traps, it has not eliminated the possibility nor have they addressed the unknown level of non-reporting of trapped eagles.

For other migratory birds, despite regulatory changes to reduce the risk of incidentally trapping migratory birds and though most have departed the state by the time the trapping season occurs, about 60 species of migratory birds remain in or migrate to Maine during the winter. These species include crows, ravens, jays, herring and ring-billed gulls, woodpeckers, turkeys, ruffed grouse, mourning doves, several owl species, redpolls, pine siskins, evening and pine grosbeaks, hawk, snowy owl, and several sea duck species.²⁰¹ Though it is unknown how many of each species are caught in traps in Maine, the FWS elected to use the gray jay for analytical purposes (i.e., to assess the effects of trapping and mitigation) in the DEA since it represents the most frequently trapped non-furbearer species in boreal environments²⁰² and is particularly vulnerable to traps baited with exposed meat.²⁰³

MDIFW does not keep records of how many gray jays are taken in traps. There are reports of gray jays taken in traps in Maine in the 1980s but it unclear if the traps were set legally. To estimate the potential take of gray jays in Maine, the FWS relied on marten trapping studies in Ontario and Alberta. Though trapping conditions and regulations are not the same in those provinces and Maine, if the ratio of gray jays to marten trapped in those provinces were applied to Maine then the FWS estimates that 150-3,015 gray jays may be taken in northern Maine annually.²⁰⁴ The FWS concedes that, based on expected densities of gray jays, this level of incidental take would not likely have a statewide-population level effect but that it could effect local populations. Nevertheless, the FWS discounts the validity of extrapolating data from Alberta and Ontario to Maine given significant uncertainty stemming from limited information and substantially different variables suggesting that the actual mortality of gray jays may be more or less than the FWS estimate.

¹⁹⁹ DEA at 87 citing C. Todd, MDIFW, unpub. Data; Todd 2000, Todd 2004.

²⁰⁰ DEA at 87.

²⁰¹ DEA at 89.

²⁰² DEA at 89 citing Novak 1987, Barrett et al. 1989, Naylor and Novak 1994.

²⁰³ DEA at 89 citing Stickland and Ouellet 1993.

²⁰⁴ DEA at 89.

The FWS then advises the MDIFW that it is in violation of both the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act for the ongoing incidental take of migratory birds, including bald and golden eagles, in Maine's trapping program. Specifically, the FWS indicates that it can't issue an ITP unless measures are taken in the final ITP to minimize take of migratory birds to the maximum extent practicable.²⁰⁵ Thus, the final ITP "should address measures to monitor (or to enforce provisions already in Maine regulations to report take of birds and other non-furbearer species)²⁰⁶ and include an adaptive management plan to address take of migratory birds."²⁰⁷ As to the incidental take of bald or golden eagles, regulations at 50 CFR §22.26 allow for the issuance of permits to take bald eagles and golden eagles where the taking is associated with but not the purpose of the activity and cannot practicably be avoided. Consequently, to receive the ITP, the MDIFW has to demonstrate "that take of migratory birds and bald and golden eagles by trapping has been adequately addressed or otherwise permitted to ensure that the trapping program is 'an otherwise lawful activity.'"²⁰⁸

Even though the obligation falls on the MIDFW to meet the requirements of the MBTA and the BGEPA, the fact that the information necessary to comply with these laws was not included in the DEA demonstrates a failure to comply with the information disclosure requirements contained in NEPA. Given the significance of this information, including this information in a final ITP or final EA is not consistent with NEPA since, any substantive change in the description of the action or the impacts of said action, must be subject to analysis in a new or supplemental NEPA document and review and comment by the public.

In regard to the impact of non-target incidental take of non-furbearing species, of particular importance with regard to Canada lynx is the take of snowshoe hares; the main prey species for the lynx. In Maine, snowshoe hares are extensively hunted during liberal seasons (October through March) and are commonly incidentally caught in foothold and Conibear traps.²⁰⁹ It is estimated that approximately 250,000 hares may be killed by hunters in Maine every year based on the last surveys to estimate such take in the 1980s. The MDIFW estimated that there were 8.5 million hares in Maine in the mid-1980s but has not since reevaluated that estimate. In addition, MDIFW does not keep records of how many hares are trapped incidentally though the FWS estimated, based on the ratio of hares taken to marten trapped in Alberta and Ontario, that the range for the incidental trapping of

²⁰⁵ DEA at 90.

²⁰⁶ It is unclear which regulations the FWS is referring to here. MIDFW regulations require the reporting of the incidental take of non-target furbearers if found dead in traps, but not for non-furbearer species or birds. If there is one or more regulations requiring the reporting of incidental take of non-furbearer species or birds, the FWS should cite to the relevant rule or rules.

²⁰⁷ DEA at 90.

²⁰⁸ DEA at 90.

²⁰⁹ DEA at 92 citing Novak 1987, Barrett et al. 1989, Proulx et al. 1989, Mowat et al. 1994, and Naylor and Novak 1994.

snowshoe hares in northern Maine would be 0 to 5,750. With an estimate of 1.8 million snowshoe hare within the lynx critical habitat area in Maine this level of take, which is believed to be compensatory, would “not have a population level effect on snowshoe hares within the core range of the Canada lynx”²¹⁰ according to the FWS.

Assuming these figures are correct, this assessment seems reasonable. What is missing from this analysis, however, is the combined effect of snowshoe hare hunting and incidental take of hares in northern Maine and how that cumulative impact may affect snowshoe hare numbers and, ultimately, lynx. This is particularly important given evidence, until 2010-2011, of a significant decline in hare densities in Maine and the adverse consequences of that decline to lynx. Furthermore, the FWS has not disclosed that Maine regulations also allow so-called “beagle clubs” the authority, once a permit is obtained, to live trap snowshoe hares for release into training pens. While it is unknown the number of snowshoe hare trapped by beagle clubs, this also must be factored into the overall impact of snowshoe hare take on lynx. Finally, even if all hare take is compensatory, given the critical importance of snowshoe hare to lynx, maturing regenerating forest stands (which will reduce quality and quantity of hare habitat), inter-specific competition for hares from other species, and the anticipated impact of climate change on snowshoe hares and their habitat, at a minimum, reducing the extent of hunting take and incidental trapping take within lynx occupied habitat may provide more potential prey for lynx. While this would not prevent the natural variability of hare and lynx populations over time, it may provide extra prey for lynx that could aid the survival of individual lynx.

Outdoor recreation and economy:

This section of the DEA focused nearly exclusively on two things: how would the various alternatives impact trappers and/or the MDIFW economically and how would the characteristics of outdoor recreational trapping change under each alternative.

Overall, this analysis was weak and incomplete. For example, though the FWS determined that Alternative C would cost each trapper approximately \$2,644 to retrofit to meet the trapping standards that would be phased in over 5 years,²¹¹ it failed to consider actual trapper demographics and, more importantly, only examined one side of the economic equation. In regard to trapper demographics, given the remoteness of northern Maine, it is unclear if those who traditionally trap in that portion of the state all reside in the area or if some travel longer distances for all or a portion of the trapping season to set traps. If the latter then the actual economic impact of each alternative would be the same as that estimated by the FWS but the impact on individual trappers may not be realized if they

²¹⁰ DEA at 92.

²¹¹ DEA at 109.

elect to trap in other portions of the state where there is no requirement to use certain type of traps. If that occurred, the number of trappers may remain the same – reducing any economic impact on the MDIFW – but they simply would choose to trap in different areas reducing trapper density and likely trap density within occupied lynx range.

More importantly, the FWS failed to consider the positive economic impacts to lynx, non-target wildlife, those who do not support trapping, and other outdoor enthusiasts who could be adversely affected by the sight of an animal in a trap and/or who could be harmed (or have a companion animal harmed or killed) if they were to step into a trap while recreating in northern Maine. By focusing on only one side of the economic equation (i.e., the adverse economic impact on individual trappers and/or the MDIFW), FWS ignored the positive direct and indirect economic impact of potentially reducing trapper numbers and trap density in all or portions of occupied lynx range. While quantifying such positive economic impacts may be more difficult to calculate, it can be done (and should have been done) using one or more economic tools that are designed to determine the intrinsic value of nature (wildlife, wild lands), aesthetics, and public safety.

A common economic tool used to calculate such positive values – and a tool used by the federal government to assess the economic costs to wildlife/nature due to oil spills – is called contingent valuation which relies on sociological surveys to determine the value of, in this case, lynx, protecting lynx from harm or death in a trap, protecting non-target species from traps, and reducing or removing traps from the landscape would be to the public. Commonly, such surveys are conducted at the local, regional, state, and national level in order to capture the opinions of those who live in the area and those who may never visit the area but who have an intrinsic interest in the protection of wildlife. In many cases, instead of having to engage in its own economic survey work, an agency can use similar surveys that may have already been done by other agencies to assess the economic value of a particular area to a wide range of potential user groups. Whether such surveys exist for northern Maine is unknown but the FWS should have endeavored to find, review, and disclose the information from such surveys in the DEA (or in a future EIS) if they do exist.

Finally, there is an argument that this economic analysis should not have even been considered in the DEA. Given that the ESA mandates that the protection of listed species is of tantamount importance, trumps other considerations, and mandates that agencies do everything in their power to achieve recovery, any cost to individual trappers or the MDIFW associated with the protection of lynx is immaterial. At a minimum, even if the FWS retains this analysis in future decision-making documents, it must provide an analysis of the positive economic impact of each alternative and largely discount the alleged negative impacts due to ESA mandates.

Impacts to Canada lynx:

Since 1999 and including incidental captures of lynx during the 2011 trapping season, 60 lynx have been trapped in Maine. Of this total, the available evidence indicates that 54 were released while 6 died including one that was reported dead in 2011. Of the six lynx that died, five were captured in Conibear traps²¹² and one was illegally shot by a hunter in a foothold trap.²¹³ In addition, at least one of the lynx captured in 2004 was injured, subject to rehabilitation, released, but died within two weeks of release from starvation.²¹⁴ Indisputably, given the time frame involved, this death is directly linked to the animal's incidental capture. For the remaining lynx trapped and released, not including those radio-collared research animals subsequently caught by trappers for which their fate is known, there is no data on how long the animals lived post release. However, as indicated in the DEA, it is expected that additional lynx died from trap-related injuries post release and that kittens separated from their mothers due to trapping also likely died.²¹⁵

The reality, as disclosed by the FWS in the DEA, is that the reported 53 (1999-2010) or 60 (1999-2012) lynx trapped in Maine is a minimum estimate. Though Maine has mandated the reporting of incidentally trapped lynx since 2008, there is simply no way of knowing whether trapper compliance with that mandate is 10 percent or 90 percent. Considering that trappers may be fearful of prosecution if they report a captured lynx (particularly if the animal is dead) or that they may trigger increased restrictions on trappers within occupied lynx habitat, the likelihood of high compliance with the mandatory reporting requirement is low.

There are several examples of non-reporting of incidentally captured lynx in Maine and other evidence that demonstrates the fallacy of expecting trappers to report trapped lynx. In 2003 and 2004, for example, a MDIFW warden captured and released two lynx without reporting the captures to the MDIFW. While reporting requirements were only voluntary -- but strongly encouraged -- at that time, the fact that a wildlife law enforcement officer elected not to voluntarily report these captures is troubling as one would expect that a warden would more likely act in accordance with the standards set by the MDIFW than would a trapper.²¹⁶ Furthermore, in late November/early December 2008, one trapper is known to have attempted to discard the dead body of a trapped lynx in hopes that it would

²¹² This includes the trapped lynx reported dead in 2011. Though the MDIFW internal report on this incidental mortality indicates that the case was still under investigation, a January 28, 2012 article in the Bangor Daily News indicates that the dead lynx from 2011 was captured in a conibear trap. Bangor Daily News, '1 lynx killed, 6 trapped as state waits for 'incidental take' permit,' January 28, 2012.

²¹³ DEA at 99.

²¹⁴ ITP/HCP at 59.

²¹⁵ DEA at 99.

²¹⁶ See *Animal Welfare Institute et al. v. Roland Martin*. Stipulated Facts, United States District Court for the District of Maine, CV No. 08-cv-00267-JAW.

not be discovered.²¹⁷ In an email from Shannon Crowley of the MDIFW to Mark Stadler of the MDIFW dated May 17, 2006, Ms. Crowley reports on incidental lynx captures reports (of two lynx) that she received “this afternoon.” The reports were from lynx captured in early November 2005. While the trapper in this case did report the takes, it is disconcerting that he waited 6 months to do so. In a blog posting found by Mr. Daryl DeJoy of the Wildlife Alliance of Maine, a trapper indicates his support for reporting lynx hit by cars, but “reporting a lynx in a trap is a totally different story.”²¹⁸ A second trapper responds by exclaiming that “I won’t make that mistake again” while another recommends that “if you see either (lynx or cougar) sss” referring to the adage to “shoot, shovel, and shut up.” To make matters worse, Mr. DeJoy reported that, in June 2006 he received an anonymous tip that an assistant trapping trainer told trainees at a MIDFW trapper training session not to report lynx or eagle take and to “shoot, shovel, (and) shut up.”²¹⁹

Even the MDIFW recognizes that not all lynx that are incidentally trapped are reported²²⁰ yet, with the exception of implementing the mandatory reporting requirement, it has made no other effort to study or otherwise develop a more accurate estimate of the actual reporting rate for the incidental trapping of lynx.

The value of accurate take reporting data cannot be diminished. Not only is it critical for understanding the actual level of take of lynx but that, in turn, aids in establishing effective trapping standards to reduce or eliminate said take. In addition, reporting data would provide information about the sex and age of the lynx captured providing evidence valuable for assessing the impact of incidental capture on the female component of the lynx population and to estimate the potential take of kittens. Information collected on trap type, trap set characteristics, the date of the incident, use of drags or stakes, and whether bait, scents, or lures were used, this data can be used to identify those variables that increase, or decrease, the potential for incidental capture allowing for further refinement of state trapping regulations and guidance to avoid or minimize such incidental takes. Without knowing the proportion of incidentally caught lynx that are reported, the claim that no lynx have been reported taken in leaning pole Conibear sets since the leaning set regulation went into effect in 2008 is meaningless.

The uncertainty inherent in determining the impact of incidental take on Maine’s lynx population is not only due to the lack of a high trapped lynx reporting rate, but also due to the unreliability of the state’s lynx population estimates including a lack of statistical

²¹⁷ See *Animal Welfare Institute et al. v. Roland Martin*. Third Declaration of Camilla Fox, United States District Court District of Maine, CV No. 08-cv-00267-JAW.

²¹⁸ See *Animal Welfare Institute et al. v. Roland Martin*. Declaration of Daryl DeJoy, United States District Court, District of Maine, CV No. 1:08-cv-00267-JAW.

²¹⁹ See *Animal Welfare Institute et al. v. Roland Martin*. Declaration of Daryl DeJoy, United States District Court, District of Maine, CV No. 1:08-cv-00267-JAW.

²²⁰ ITP application/HCP at 84.

confidence limits. In 2010, for example, the MDIFW estimated that its lynx population ranged from 300 to 1200, which is far from a precise estimate. Admittedly, statistically robust methods to evaluate lynx population have not been developed,²²¹ existing methods are imprecise, or prohibitively expensive,²²² yet, if anything, this difficulty begs that the precautionary principle be employed here and that the MDIFW and FWS implement the strictest trapping standards possible, including the possibility of terminating upland/dryland trapping, in occupied lynx habitat in order to protect lynx and ensure their recovery as required by the ESA.

Instead, the MDIFW in its ITP application/HCP attempts to suggest that all is well with the state's lynx population, that incidental trapping of lynx won't result in any meaningful impact to the population, and that dialog with the trappers, not additional regulations, is the ideal path for the future. Though the MDIFW evaluated possible additional restrictions on trapping to reduce the incidental capture of lynx, it dismissed each option as either unnecessary based on the allegedly low rate of existing incidental capture or, remarkably, because select options may be inconvenient to trappers. Thus, with the sole exception of agreeing with making the reporting requirement mandatory, the MDIFW requested that the FWS issue a 15-year ITP to permit the following²²³:

ITP Request	Annually	5 Years	15 Years
Incidental captures	11	55	165
Release with No Injuries	5.3	26	79
Severe Injuries	0.2	1	3
Adult Mortality	.1	1	3 ²²⁴
Juvenile Mortalities	.13	.65	2
Total Lynx Mortalities	.4	2	5

²²¹ In an email from Walter Jakubas of the MDIFW to Ken Elowe also from the MIDFW, Mr. Jakubas reports that "it doesn't appear that the technology is currently available for us to monitor the lynx populations or their habitat in a meaningful way."

²²² DEA at 99/100.

²²³ ITP application/HCP at 32, 285, 286.

²²⁴ ITP application/HCP at 61; In regard to the lethal take of adult lynx, the MDIFW assume, as a worst case scenario, that for every female lynx of breeding age taken/killed, two kittens will die. As indicated by the MDIFW, unless tracking conditions are favorable or kittens are seen, it may not be possible to determine whether an adult female that was killed in a trap was accompanied by kittens since the adult female would have stopped lactating by the start of the trapping season which, therefore, led it to assume that for every adult female lynx killed as a result of incidental trapping both kittens will perish.

As an initial matter, the take for which the ITP is being requested is based on reported, not actual take. Since the trapper compliance rate with the mandatory reporting requirement is not known, the reported amount of take may be considerably lower than actual take. Consequently, the use of these numbers in any assessment of the impact of the requested take levels on the population – as the MDIFW has done with its deterministic model – is meaningless unless the model incorporates a parameter that incorporates a set or variable level of unreported take.

In addition, the mitigation offered by the MDIFW in its ITP application/HCP (i.e., the proposal to establish 5,000 acres of lynx habitat on state lands within the duration of the ITP) is intended to only compensate for the mortality of 5 lynx (1 female, 2 males, 2 kittens) that would be covered by the requested ITP. The MDIFW offers no mitigation for the lynx that are taken (i.e., harmed, harassed) but not killed under the ITP. This is, as indicated by the FWS in the DEA, a deficiency in the ITP application/HCP and the ITP process should, at a minimum, cease until the MDIFW provide mitigation for non-lethal takes of lynx inherent to its trapping program.

Though the requested permit to incidentally capture 11 lynx per year was based on the largest number of lynx captured in any one year between 1999 and 2007 (which was 11 in 2004), the MDIFW then requested a 20 percent variance in the incidental capture rate increasing the request to 13 annually, 65 every five years, and 195 over the duration of the permit. Considering that from 1999 through 2011, an average of 4.7 lynx were incidentally trapped annually, the MDIFW original request to be allowed an incidental trap rate of 11 seems excessive particularly since 2004 was prior to the implementation of changes to the trapping regulations that were intended to reduce incidental take. It claims that the requested 20 percent increase is to allow for the possibility of further growth in the population.²²⁵ This is not a suitable justification to increase the permitted take since the entire objective of an ITP is to minimize take, not increase it. While this requested increase could be understood if there were no more that the MDIFW could do to reduce incidental take, since there are a host of additional actions it could take, the MDIFW should reduce, not increase, the number of incidental trapping incidents that it is seeking authorization for from the FWS. To request an additional 20 percent variance thereby increasing the incidental take rate to 13 is entirely unsupported by any evidence proffered by the MDIFW and must not be countenanced by the FWS.

Similarly, the requested permission to take 1 female lynx, 2 male lynx, and 2 kittens also raises questions as to the veracity or reasonableness of those numbers. While many of the details of about the 60 lynx incidentally trapped from 1999 through 2011 remain unknown (i.e., in many cases the age/sex of the animal and extent of injury are described as unknown), we know that at least 7 lynx (5 of 7 captured in Conibear traps and 2 lynx

²²⁵ ITP application/HCP at 64.

captured in foothold traps) died either directly or indirectly as a result of trapping.²²⁶ Furthermore, based on an assessment of the 1999-2007 incidental trapping data along with information from five of the reported seven lynx incidentally trapped in 2011²²⁷ we know that:

Adult male lynx captured in foothold trap:	11
Adult female lynx captured in foothold trap:	5
Unknown adult captured in foothold trap:	3
Unknown animal captured in foothold trap:	23
Adult male lynx captured in Conibear trap:	1 (fatality)
Juvenile male captured in Conibear trap:	1 (severe injury)
Juvenile female captured in Conibear trap:	1 (mild injury)
Unknown juvenile captured in Conibear trap:	1 (fatality)
Unknown animal captured in Conibear trap:	1 (fatality)
Total	47

In addition, another 11 lynx were incidentally trapped in 2008, 2009, and 2010. Even if those 11 lynx are excluded from this analysis, over the course of 10 years (1999-2007 and 2011), 12 adult male lynx, 5 adult female lynx, 1 juvenile male lynx, 1 juvenile female lynx, 3 adult lynx of unknown sex, 1 juvenile of unknown sex, and 24 animals whose sex and age were unknown were incidentally trapped.

Despite these statistics, in its ITP application/HCP the MDIFW is seeking permission to incidentally lethally take only 2 male lynx, 1 female lynx, and 2 kittens over the 15 year duration of the ITP. Considering that these statistics only reflect reported take, that we know that two lynx captured in foothold traps died as a result, that 4 of 6 lynx captured in Conibear traps between 1999 and 2007 died²²⁸, and that the fate of the majority of the lynx reported trapped and released is unknown, the requested level of take may not be realistic. This raises a number of issues and questions. If the MDIFW is seeking permission to kill a limited number of lynx through incidental trapping as an incentive to ensure that the kill rate remains under the permitted level then it should be commended. Conversely, if the ITP is granted at the requested level of lethal take, will it provide an incentive for the

²²⁶ The two lynx captured in foothold traps that died included one that was illegally shot while in the trap and a second that, due to injury, was rehabilitated and released but died two weeks later due to starvation. For that latter incident, given the timing of the death in relationship to the trapping incident, that mortality clearly was linked to the animal being trapped.

²²⁷ ITP application/HCP at 45-47 (Table 4.1); Details of the eleven incidentally trapped lynx from 2008, 2009, and 2010 were not disclosed in the ITP application/HCP or DEA. Moreover, at least two lynx captured and killed in Conibear traps between 1999 and 2007 are not reflected in the incidental take data contained in Table 4.1 of the MDIFW ITP application/HCP unless the two animals captured in Conibear traps who experienced a severe and mild injuries, respectively, ultimately died due to their injuries.

²²⁸ These four mortalities are not reflected in the statistics provided here because they are not included in the incidentally trapping data provided in Table 4.1 of the ITP application/HCP.

MDIFW and/or trappers not to report all lynx takes as required particularly if the take has or may result in a mortality due to the fear of exceeding the permitted take levels and triggering any potential penalties/repercussions for doing so? Or, did the MDIFW request permission to lethally take a smaller number of lynx (than what would be expected considering historical take statistics) in order to generate modeling results (using that number) that would demonstrate a lack of biological significance of the impact of the take on the population?

To be clear, these issues and questions are not raised here in order to suggest that the MDIFW permission to lethally take five lynx should be increased but only to encourage the FWS to consider the implications of the MDIFW's request as it proceeds with its review of the ITP application/HCP.

Notwithstanding questions about the requested level of take, to demonstrate the impact of incidental trapping of lynx on the state's lynx population, the MDIFW developed a deterministic model. The parameters used in the model were based on the results of Maine's lynx research and previously published research on lynx resource relationships.²²⁹ This model, the parameters of which are included in the ITP application/HCP, relied on demographic information from Maine's lynx research and previously published data on lynx resource relationships.²³⁰ As detailed below, this model is substantially flawed. One of the fundamental problems is that the demographic data used to set the model's parameters were from a period of time when Maine's lynx population was near or at its estimated recent peak. Consequently, even though the MDIFW evaluated different hypothetical carrying capacities in the model, the demographic data including proportion of females pregnant, mean litter size, mortality rates remained consistent with a population at or near its peak. It is, therefore, no surprise, as indicated by the FWS, that "although not specified in the draft ITP, all population simulations predicted a rapidly increasing population" with examples of a population starting at 651 increasing to 4,001 in 15 years or a population of 13 increasing to 45 during the same time period.²³¹

These results are of questionable validity even with the use of demographic data from a lynx population at its peak. The validity of the results are entirely undermined, however, since the MDIFW did not even attempt to model the population and the impact of incidental take on the population when it is declining or in a diminished state either due to natural or anthropogenic factors, or both. It is well documented that human-caused lynx mortality of any kind (including incidental trapping) would have the greatest effect at times when lynx populations fluctuate at very low levels as can occur when snowshoe hare densities are low.²³² Such circumstances when combined with the smorgasbord of other

²²⁹ ITP application/HCP at 70 citing Steury and Murray 2004.

²³⁰ DEA at 100 citing Steury and Murray 2004.

²³¹ DEA at 100.

²³² DEA at 100.

stressors that impact lynx, snowshoe hares, and their preferred habitat (i.e., existing at southern limits of range, habitat degradation and fragmentation, anthropogenic influences, climate change) can, as explained previously, cause an “extinction vortex” for lynx potentially leading to local or regional extirpation of the species.

Indeed, not only are female lynx less likely to breed, litter sizes to be smaller, and mortality rates to increase significantly when snowshoe hare densities are low, but lynx are far more vulnerable to incidental trapping under those conditions. When hare densities are low, lynx home ranges are significantly larger compared to when hare densities are high. With larger home ranges, lynx travel more throughout their range in search of food. Moreover, since they may be undernourished, they also are more likely to be attracted to bait, lures, or other attractants used by trappers to attract their intended species and, consequently, would be more vulnerable to capture. Such a scenario could also lead to lynx attempting to access traps that they may not normally show interest in, including baited traps in leaning sets intended to avoid incidental capture of lynx. Consequently, any effort to model lynx mortality and its implications to a lynx population must, at a minimum, consider both those demographic variables representative of a lynx population at high density and a lynx population at low density.

Based on the MDIFW deterministic model results, it concluded that the “mortality allowance requested in this proposal would not significantly affect the lynx population even at very low population levels.”²³³ Even if the female lynx population declined to 100, for example, the MDIFW claims, based on its modeling results, that incidental trapping mortalities would only result in approximately a 5 percent change in the lynx population over the duration of the ITP.²³⁴ If the population declined even further and consisted of only 25 female lynx, the MDIFW claims that the allowable mortality rate requested in its application would not have a significant effect on Maine’s lynx population.²³⁵ Even at that small population size, the modeling results indicate that if the probability of killing a lynx increased 10-fold (50 lynx over a 15 year period with 10 females and 20 kittens being killed in year 5), the population would only be reduced by 6% after 15 years compared to the same population that had no mortalities from incidental trapping.²³⁶

More specifically, the MDIFW reports that at the current rate of kitten survival (78%) and given a starting population of 150 males and 150 females, the resulting lynx population without any trapping related mortalities would only be .6% higher than the population that incurred trapping mortalities.²³⁷ Even if kitten survival dropped by 7.8% the difference between the two populations (i.e., on with incidental trapping mortality and one without)

²³³ ITP application/HCP at 140.

²³⁴ ITP application/HCP at 154.

²³⁵ ITP application/HCP at 152.

²³⁶ ITP application/HCP at 152.

²³⁷ ITP application/HCP at 72.

would be 1% after 15 years. Even using the example of a small population (25 females/25 males) but retaining a kitten survival rate of 78 percent, the MDIFW model indicates that the difference between populations that incurred and did not incur trapping related mortality would be only 3.5%.²³⁸ The difference between the same two populations would increase to 54.7% if kitten survival dropped by ten-fold to 7.8%.²³⁹ Finally, even when available resources could only support 25 female lynx and the population started with only 3 female founder animals, at the end of the 15-year permit cycle there would only be an 11.2 percent difference (or 6 animals) between a population that had incurred the maximum number of trapping related mortalities and one that had incurred no trapping mortalities.²⁴⁰

Overall, as reported by the MDIFW, it did not foresee circumstances where a declining lynx population would lead to a significant change in the effects of incidental trapping on the lynx population and, therefore, no contingencies were developed to address a declining lynx population for the core elements of the Department's ITP application.²⁴¹ This decision is troubling considering that the MDIFW documented a substantial downturn in the lynx population (in response to a decline in snowshoe hare densities) in the mid-to-late 2000s and since, as the MDIFW concedes, the lower survival rate and lower production of adult females will affect recruitment rates which, in turn, "will lower the number of animals that can be harvested."²⁴² Furthermore, the MDIFW's stated uncertainty as to whether the proportion of lynx caught in traps would increase or stay the same in a declining population²⁴³ is unnecessary. It is abundantly clear in the literature and by simply applying some common sense that when a lynx population is declining this is usually in response to a decline in its primary prey (snowshoe hares) and results in larger home ranges, more travel/movement, and, consequently, an increase likelihood of being trapped. The fact that the animals are likely hungry only further adds to their increased vulnerability to trapping.

These conclusions, since they are based on demographic parameters reflective of a growing lynx population or one at its peak, cannot be relied on to accurately reflect the impact of incidental take on the lynx population given natural and/or human-caused fluctuations in the lynx population. Indeed, when parameters indicative of a declining or diminished lynx population are used, the impacts of the incidental take rate on the lynx population become evident and are adverse. To understand the flaws in the model, the parameters used by the MDIFW must first be evaluated (see table below). At the outset, it should be noted that these parameters are largely based on lynx research done in Maine on a study site which even the MDIFW concedes is "not representative of all of Maine"²⁴⁴ and which others have

²³⁸ ITP application/HCP at 72.

²³⁹ ITP application/HCP at 72.

²⁴⁰ ITP application/HCP at 71.

²⁴¹ ITP application/HCP at 152.

²⁴² ITP application/HCP at 70 citing Knick 1990.

²⁴³ ITP application/HCP at 152.

²⁴⁴ ITP application/HCP at 53.

suggested, due to extensive timber harvest in the area, may represent some of the best snowshoe hare/lynx habitat in Maine. This calls into question whether the parameter used by MDIFW in its model are even reflective of the demographics of the state's lynx population.

Parameter	Value or quantity	Evaluation/comment	Citation
High female carrying capacity	1000	At a 1:1 sex ratio this would suggest a total population of lynx in Maine of at least 2,000 well in excess of any existing population estimate	ITP application/HCP at 71
Low female carrying capacity	25	At a 1:1 sex ratio this would suggest a total population of lynx in Maine of only 50 animals	ITP application/HCP at 71
Base starting population of breeding animals	150 males/ 150 females		ITP application/HCP at 282
Pregnancy rate for female lynx (3 years and older)	75 percent	Based on lynx observations/data collected from 1999 through 2007	ITP application/HCP at 60, 283.
Mean litter size	2.4	Based on lynx observations/data collected from 1999 through 2007	ITP application/HCP at 60, 283
Kitten survival rate/mortality rate	78%/22%	When number of females in the population was at or below 250, the kitten survival rate was 78%. When the female population increased to the maximum theoretical size of 1,000 the kitten survival rate was 0. As the population increased from 250 to 1000 (in response to increased resource – snowshoe hare – availability) the kitten survival rate declined from 78% to 0%.	ITP application/HCP at 283/284 citing Mowat et al. 1996
Adult mortality rates	24% females 19% males	Would correspond to a survival rate of 76% for females and 81% for males. Also according to MDIFW as the population increases the survival rates decline.	ITP application/HCP at 285
Juvenile mortality rates	48% females 38% males	Based on information indicating that juvenile mortality rates were twice	ITP application/HCP at 285

		of the adult mortality rates. Would correspond to a survival rate of 52% for females and 62% for males. Also according to MDIFW as the population increases the survival rates decline.
--	--	---

What is missing from these parameters as described in the ITP application/HCP but which is, at minimum, necessary for any modeling exercise includes: the age of senescence of female lynx (i.e., at what age female lynx no longer can produce young); the age of first reproduction for male and female lynx; and the age structure of the population (i.e., what proportion of the population are kittens, juvenile, and adults as that effect the percentage of the population capable of reproduction). In its model, the MDIFW started with a base population of 150 breeding male and 150 breeding female lynx (with breeding lynx being 3 years of age or older) but, without age structure data, it is impossible to represent the proportion of juvenile lynx and lynx kittens that are likely to be recruited into the population initially which then affects all of the modeling results. It is possible that these missing parameters were actually included in the model but not disclosed in the description of the model included in the ITP application/HCP. The actual model results or a comprehensive summary of the results was not provided in the ITP application/HCP.

Conversely, if the demographics of a declining lynx population are considered, the model parameters change considerably. These parameters, which are also based on MDIFW research²⁴⁵, include a 12.5 percent pregnancy rate, a mean litter size of 2, an adult lynx mortality rate of 39% (no distinction provided between males and females corresponding to a survival rate of 61%), a kitten mortality rate of 93% (based on a 93% reduction in number of kittens/adult female lynx), and a juvenile lynx mortality rate of 78% (based on the MDIFW claim that juvenile lynx mortality rates are double those of adult lynx yet without any difference between male/female lynx). Using these statistics and, for the purpose of the following analysis, assuming that the lynx population is closed, that the age of first reproduction is 3, that there's an equal sex ratio at birth and beyond, that the survival/mortality rates incorporate the take anticipated during the life of the ITP, and that the population, at year 0, consists of only 150 breeding females and 150 breeding males, a basic back-of-the envelope model can be run using the following equation:

$$150 \text{ (breeding age females)} \times .61 \text{ (adult female survival rate)} = A \text{ (total breeding females), then;}$$

²⁴⁵ See May 2, 2007 Memorandum from Jennifer Vashon to Ken Elowe, Mark Stadler, Wally Jakubas, Rich Dressier, and George Matula re: Lynx Study Update and USFWS 5-year status review; See also May 14, 2007 final report from Canada Lynx Research Coordination Meeting, MDIFW Bangor Headquarters.

$A \times .12.5$ (pregnancy rate) $\times 2$ (mean litter size) $\times .07$ (kitten survival rate) $/ 2 = Ba$ and Bb (number of male and female lynx kittens, respectively), then;

150 (breeding age males) $\times .61$ (adult male survival rate) $= C$ (total breeding males), then;

$Bb-1$ (female kitten number from previous year who are now juveniles) $\times .22$ (juvenile female survival rate starting in year 2) $+ Ba-1$ (male kitten number from previous year who are now juveniles) $\times .22$ (juvenile male survival rate starting in year 2) $= D$ (total number of juvenile lynx surviving after year), then:

$A + Ba + Bb + D$ (starting in year 2) $+ C = T$ (total number of animals in population)

The results of this equation reveal that after the end of year 1 there would be 91.5 adult female lynx and 91.5 adult male lynx in the population along with .8 female lynx kittens and .8 male lynx kittens for a total population of 184.6 animals. At the end of year 2, the total remaining population would be 112.90 animals.

If this equation is run for the full duration of the 15 year permit it is clear that the population, if it even were to persist for the full 15 years, would be virtually gone. Though this can only be considered a crude back-of-the-envelope type of model, it reveals that, when the lynx population is diminished or declining, the impact of incidental take in combination with natural mortality on the lynx population is devastating.

Indeed, as reported by the FWS in the DEA, the MDIFW model is not the only model developed to predict the impact of incidental trapping of lynx in Maine.²⁴⁶ Dr. Paul Paquette, using a VORTEX population model populated with similar demographic data as those used by MDIFW, revealed that, with a starting lynx population of 500 in year 1, the population would decline to 258.4 (year 5), 123.22 (year 10), 63.82 (year 15), 27.28 (year 20), 12.42 (year 25), 4.40 (year 30), 1.66 (year 35), .59 (year 40), .32 (year 45), and 0 (year 50). The probability of the population's extinction, as predicted by this VORTEX population model, reached 83 percent by year 35 and 100 percent by year 50. The results of this VORTEX model are attached as Exhibit 1.

In another example, spatially explicit models used to evaluate the effects of habitat loss, trapping in Quebec, and climate change on the Maine-New Brunswick-Quebec lynx population, found that Quebec's lynx trapping program on the Gaspé would increase the vulnerability of lynx populations in southeastern Canada and northeastern United States.²⁴⁷

²⁴⁶ DEA at 129.

²⁴⁷ DEA at 100.

Collectively, this information demonstrates that the results of the MDIFW model must be seriously questioned by the FWS. Given the various models prepared to evaluate the impact of incidental take on this population, at a minimum, the FWS must engage a third party to prepare a comprehensive model to determine how incidental take will impact this population in light of existing levels of natural mortalities as well as predicted future changes in the mortality rate as environmental/habitat conditions change.

Independent of the concerns about the MDIFW model, the MDIFW has proposed a mitigation measure to compensate for any lethal take that may be allowed in the ITP (if granted). Specifically, the MDIFW has indicated, as reflected in Alternative B, that it would seek to create 5,000 acres of lynx habitat to compensate for the estimated 5 lynx killed (3 adults, 2 juveniles) in the next 10-15 years or sooner if the ITP is issued.²⁴⁸ The MDIFW claims that “if sufficient habitat were provided to allow at least one additional pair of lynx to reproduce at a normal rate, more than enough offspring would reach adulthood to replace the 5 lynx that might be killed by incidental trapping.”²⁴⁹ Though this represents a type of concession by the MDIFW, there are significant deficiencies with its proposal most of which pertain to the lack of relevant detail provided in the ITP application/HCP. The FWS identified this deficiency in its DEA pointing out that the potential location of this mitigation land was not disclosed, there was no time frame for creating the habitat, best management practices or standards were not identified, use restrictions not disclosed, the quality of the habitat is not addressed, it is unclear if this land would be permanently available to lynx, and enforcement standards are absent from the description of this mitigation proposal.²⁵⁰

Alternatives C and D, if selected, would establish mitigation areas of 10,000 acres (on state lands) and 7,000 acres (on private lands)²⁵¹, respectively yet, again, the specific attributes of, and management mechanisms for, these areas need to be disclosed and described. Another concern is the repeated claim that, for these areas to represent quality lynx habitat, they would need to be highly manipulated through the use of clearcuts or other silviculture management mechanisms to create the type of regenerated conifer forest habitat preferred by snowshoe hares and, in turn, lynx. Considering that it takes 12 to 35 years for clearcut

²⁴⁸ ITP application/HCP at 110.

²⁴⁹ ITP application/HCP at 102; noting that the ability of the proposed mitigation areas to compensate for incidental trapping mortalities of lynx assume that offspring from the breeding pair of lynx that utilize the mitigation lands would disperse and have survival and reproductive rates similar to other lynx in Maine.

²⁵⁰ DEA at 26.

²⁵¹ The FWS concludes that the creation of 7,000 acres of lynx habitat on private land as called for in Alternative D would have a greater probability of supporting at least one breeding pair of lynx than the proposed 5,000 acres of habitat under Alternative B because there is a greater probability of supporting a breeding pair of lynx on a larger area when hare populations are low, there are many more options for selecting high quality areas for lynx conservation on private lands than on state lands, and long term, legally binding management agreements would be required in Alternative D. DEA at 105/106.

habitat to become high quality snowshoe hare habitat, even if the MDIFW created this mitigation area immediately after receiving a permit, the habitat created would not likely be valuable for hares or lynx until the ITP has expired. What is not known is whether alternative habitat manipulation strategies would expedite the creation of quality hare and lynx habitat.

More importantly, given the adverse impacts to wildlife species (e.g., marten), soils, vegetation, and the indirect impacts associated with creating roads used to harvest timber from these areas (e.g., increased accessibility to trappers/hunters, creation of edge habitat, alterations in predator-prey dynamics), there has to be more analysis of the environmental consequences of creating such mitigation habitat, proof that the resulting lands will provide quality habitat for hares and lynx, and to provide more specific data on expected adverse and beneficial impacts of such a proposed mitigation area. As part of this analysis, it should be explained how lynx survived in Maine historically before active forest management – clear cutting or other timber harvest strategies – became commonplace to generate revenue, clear lands, or create alternative habitats. If the impacts prove to be excessive, particularly if they outweigh any potential benefits, alternative mitigation measures – including the consideration of a prohibition on upland/dryland trapping within occupied lynx habitat – may warrant consideration.

Cumulative impact analysis:

The FWS has, as is required in any NEPA document, included an analysis of the cumulative impacts of the action (i.e., the potential issuance of the ITP permit) in relationship to other past, present, and reasonably foreseeable future actions that may affect lynx, snowshoe hares, lynx habitat, other wildlife, and the ecosystem processes that influence and affect wildlife, including lynx, in Maine. It is important to note that, the cumulative impact analysis must include actions not only taken or that will be taken by federal agencies, but also those actions under the jurisdiction of state agencies, local municipalities, and even private citizens. Moreover, the purpose of a cumulative impact analysis is not simply to disclose what the cumulative impacts are or will be but to actually analyze how those impacts may impact, in this case, lynx over time. This analysis should, to be complete, consider a full range of cumulative impacts from a best case scenario to a worst case scenario in order to provide the agency decision-makers and the public with an understanding of what can be expected in the future and how actions taken in the past, today, and those reasonably foreseeable in the future will impact lynx, lynx habitat, lynx ecology, and other wildlife species.

The cumulative impact analysis in the DEA identifies several past, present, and reasonably foreseeable actions that may impact, nearly all adversely, lynx and lynx habitat. The glaring omission from this analysis is the impact of recreation, primarily winter recreation, on lynx as was addressed previously in this comment letter.

Another omission in the cumulative impact analysis, not previously raised in this comment letter, is the impact of the illegal international trade in feline pelts, including lynx, to satiate the demand for such products in overseas markets. The Canada lynx is listed as an Appendix II species under the Convention on International Trade in Endangered Species of Flora and Fauna (CITES). As such, it can be legally traded for non-commercial and commercial purposes assuming the exporting country verifies that the animal, pelts, or any product was legally acquired and that the removal of the animals from the wild will not be detrimental to the survival of the species. In 2010, for example, the United States exported 10 lynx garments, 22 lynx hair samples, 100 lynx claws, and 5,601 lynx skins²⁵² which would suggest that it has prepared a non-detriment finding as required by CITES and U.S. law implementing CITES. What is not known is how many Canada lynx pelts or other products are illegally taken and subsequently traded (domestically or internationally). Considering the unfortunate yet ongoing demand for animal pelts for the production of fur coats, gloves, mittens, ear muffs, purses, and a variety of other fashion accessories, including escalating demand from Russia and China, the illicit trade in lynx from the United States may be high. Though there is no readily accessible database of confiscations of illegally exported Canadian lynx products by U.S. or other authorities, the FWS could easily obtain such information from its law enforcement office. Of course, even if such confiscations are minimal, illegal trade could still be occurring. Indeed, it is generally accepted that only approximately 10 percent of illegally traded wildlife or wildlife products is ever interdicted.

The factors included in the cumulative impact analysis include trapping, changing land ownership patterns, changing forest practices, energy-related development, residential and resort development, and climate change. A brief summary of the potential impacts of each of these factors, as provided below, demonstrates frankly the dire long-term outlook for lynx in Maine.

Trapping: The FWS claims that the “adaptive process MDIFW uses in setting regulations and harvest quotas based on annual assessment of population status ensures that harvest regulations are consistent with long-term conservation of these species.”²⁵³ This may be more wishful thinking than reality since few state wildlife agencies, including Maine, actually have accurate population estimate for furbearing species, relying instead on various indices, including trapping statistics, to determine harvest quotas. Far from representing a science-based management paradigm, this technique can best be described as a “shoot from the hip,” “fly by the seat of your pants,” and “leap before you look” management where best guesses based on often inadequate data are used to establish quotas and permit “harvest” of wildlife. Of course, for many furbearing species, in Maine and

²⁵² Trade data obtained from: <http://www.unep-wcmc-apps.org/citestrade/trade.cfm>

²⁵³ DEA at 114.

elsewhere, there are no quotas and, consequently, kills are controlled through the number of trappers, number of traps, efficiency of trappers, and season length. Furthermore, considering the various factors identified as affecting lynx in the future in Maine, these same factors will indisputably affect other wildlife – and are affecting them already – raising even more questions about whether MDIFW’s adaptive process is really providing for the long-term conservation of these species.

For non-target species that are subject to incidental trapping, the FWS is not as complimentary of Maine’s management efforts. Specifically, the FWS indicates that:

The effects of incidental trap mortality is less certain for lynx and other non-target species of wildlife, because the magnitude of the number trapped and population status of these species are uncertain, and the ability of these species to withstand trapping mortality in addition to other sources of mortality has not been studied.²⁵⁴

Considering that Maine does not have reliable population estimates for lynx or perhaps every other non-target species, with the exception of high profile species (e.g., eagles, other raptors), the FWS conclusion may be an understatement. The lack of any mechanism to collect data on the incidental trapping or take of these species is also disconcerting as it demonstrates not only a lack of concern by MDIFW as to how trapping may be affecting these species but also a failure to apply its mandate of conservation and protection of Maine’s “wildlife resources” – given to it by the Maine legislature on behalf of the citizens of the state. If anything, this attitude of non-concern and nonchalance, is entirely antithetical to the public trust doctrine that the MDIFW should embrace which entrusts it with the proper and responsible management of all wildlife in the state in consideration of the interests of the public (both in Maine and nationwide). In regard to lynx, as previously documented in this comment letter, the MDIFW has not provided anywhere near the level of analysis required to understand the impacts of incidental trapping on the species and to mitigate those impacts. That is, in part due to the lack of critical information necessary to conduct a review, but this void in data, evidence, or information does not obviate the MDIFW’s responsibility to engage in the required analysis and decision-making process.

Changing ownership patterns:

In a 25-year period, between 1980 and 2005, land ownership patterns switched from ownership dominated industrial and family ownership to ownership by financial investors, real estate development trusts, private individuals, and conservation organizations.²⁵⁵ Within that period, from 1994 to 2005, forest industry ownership fell from 60 percent of the large tracts of land in Maine (>5,000 acres) to only 15.5 percent while investor share of

²⁵⁴ DEA at 114.

²⁵⁵ DEA at 114.

the large tracts rose from 3 percent to 33 percent.²⁵⁶ This shift to more investor owned lands has brought with it a decline in interest in biodiversity practices as there is a trend toward subdivision and smaller parcel sizes. While the change in ownership patterns and land turnover trends has provided opportunities for conservation groups to purchase lands or secure conservation easements, the trend toward subdivision makes it more difficult to secure long-term management agreements to benefit lynx and other wildlife. Short and long-term, continued sales of forest land, including forest land in northern Maine, are predicted to result in: increase parcelization; increased development and fragmentation; increased concerns and regulations on timber harvest and recreational use; a decrease in land available for timber harvests, recreation, and tourism; decreased investment in forest management; increase in taxes; and an increase in traffic and congestion that may affect timber hauling costs.²⁵⁷ Such changes will, inevitably, impact wildlife and wildlife habitat as well potentially benefiting some species (those more adaptable and tolerant of human activities) and adversely impacting others.

Changing forest practices:

The use of clearcutting in the 1970s and 1980s along with herbicide use to remove competing hardwood species, created extensive stands of regenerating softwoods. These young and regenerating forests became the habitat that supports Maine's current lynx population.²⁵⁸ As these forests regenerated, they became optimal habitat for snowshoe hares and, consequently, lynx allowing the lynx population to increase to what were likely its historic highs in the early 2000s when hare densities averaged 2.0 to 2.5 hares/hectare providing plenty of prey for Maine's growing (at the time) lynx population.²⁵⁹ In 1989, with the promulgation of the Maine Forest Practices Act, there was a major shift in silviculture strategies from clearcutting to various forms of partial harvesting. As a consequence, as indicated in the DEA, hare density in regenerating partially harvested woodlands is only 0.8 hares/hectare which is near the lower limit (i.e., 0.7 to 1.1-1.8 hares/hectare) that can support lynx.²⁶⁰ Indeed, the FWS cautions low hare densities of 0.4 hares/hectare in partial harvested stands and 1 hare/hectare in regenerating clearcuts may not be sufficient to support lynx in some portions of northern Maine. As previously indicated, when hare densities are low (as they were in the mid-late 2000s in Maine), MDIFW's own studies reveal a near absence of reproduction and higher lynx mortality. While there was an uptick in hare densities in 2010-11, changes in timber harvesting practices have resulted in predictions of a 65 percent decline in lynx densities by 2032 – only twenty years from now.²⁶¹

²⁵⁶ DEA at 114 citing Hagan et al. 2005.

²⁵⁷ DEA at 115.

²⁵⁸ DEA at 116 citing to Hoving et al. 2005.

²⁵⁹ DEA at 116 citing to Lachowski 1997, Robinson 2006.

²⁶⁰ DEA at 116 citing to Simons 2009, Scott 2009, Steury and Murray 2004.

²⁶¹ DEA at 116 citing to Simons 2009.

Energy related development:

The DEA indicates that there has been an increased interest in energy potential of Maine's northern forest. Already there are nine biomass-fueled electricity generating plants and 3 wood pellet mills with more mills being planned. As such energy developments come on line, biomass harvesting could greatly change silviculture practices in the northern forests of Maine. In addition, with two wind power facilities in operation and another seven proposed, such projects could impact development potential and patterns in northern Maine.²⁶² Whether the potential changes in silviculture practices would benefit lynx is unclear and not discussed in the DEA although, overall, it would appear that energy developments in lynx habitat and their associated infrastructure would be detrimental to the species and their habitat.

Residential and resort development:

Due to changes in land ownership patterns as summarized above, new owners are from frequently seeking to convert forestlands to real estate developments and resorts. For example, the Moosehead Lake concept plan for Plum Creek, approved in 2009, could potentially allow the development of approximately 1,000 houses and 2 resorts on 17,000 acres within lynx range – the largest development project in Maine's history.²⁶³ While most development into the foreseeable future will occur on the fringes of Maine woods where there is access to infrastructure, as energy developments, including wind and biomass facilities, come on line it is anticipated that development will expand to more interior forests. Again, the FWS does not indicate how such development could specifically affect lynx, lynx habitat, and other wildlife but, with the exception of adaptable/tolerant species, the anticipated impact is not positive.

Climate change:

Lynx are a specialty species adapted to – and reliant on – snow and snowshoe hares. Lynx have evolved physical attributes, like large saucer-like paws, that provide a competitive advantage in deep snow habitats. But without deep snow, bobcats, fishers and other predators may out-compete lynx for prey in northern Maine.²⁶⁴ As the climate continues to warm, lynx will likely need to move north to survive²⁶⁵ or they will have to adapt and

²⁶² DEA at 117.

²⁶³ DEA at 118.

²⁶⁴ See U.S. Fish and Wildlife Service, Canada Lynx and Climate Change, available at: <http://www.fws.gov/northeast/climatechange/stories/lynx.html>

²⁶⁵ DEA at 9; citing U.S. Fish and Wildlife Service final rule establishing critical habitat for the lynx (50 CFR 8616), "new information on regional climate changes and potential effects to lynx habitat were considered (e.g., Gonzalez et al. 2007; Knowles et al. 2006; Danby and Hick 2007). This new information

survive under environmental conditions that would be entirely foreign to the species. As indicated in the DEA, “the effects of climate change on Maine’s ecosystems, wildlife populations, and specifically Canada lynx are of increasing concern.”²⁶⁶ Among Maine’s myriad wildlife species – most of which will likely be affected to some degree by climate change – the lynx and pine marten have been identified as sensitive to climate change and other environmental stresses.²⁶⁷

As indicated in the DEA, anticipated changes to Maine’s climate will likely affect the distribution and abundance of wildlife and their habitats.²⁶⁸ With the expected reduction in spruce-fir habitat, there will likely be a corresponding reduction in the range of lynx, marten, and other species. In recent years, climate change and timber harvest may be altering forest growth characteristics resulting in a shift toward hardwoods in northern Maine forests.²⁶⁹ Consequently, there is little question that climate change is already impacts Maine’s forests and, in turn, habitat quality for lynx and snowshoe hare. In the long term, climate change impacts are anticipated to alter the distribution and abundance of tree species, alter tree growth rates (positively and negatively depending on the species),²⁷⁰ with such changes affecting lynx populations and distribution into the future.²⁷¹

Despite the compelling evidence that climate change will adversely impact lynx (and other wildlife) in Maine and the fact that these effects are already occurring, the FWS claims in the DEA that climate change will likely have negligible effects on Maine’s furbearers during the 15-year life of the ITP.²⁷² This is wrong. First, as explained earlier in this letter, given the potential for significant environmental changes in Maine’s northern forests due to climate change and for the other reasons included in the cumulative impact analysis, the duration of the ITP should be shorter than 15 years and, preferably, only 7 years at most. Second, while we are not suggesting that climate change will cause the extinction of the lynx in 15 years in Maine, claiming that the effects will be negligible over the next 15 years simply passes the buck for this issue to be given its due regard during the next ITP cycle. At that time, more than likely, the FWS will again claim that the impacts of climate change will be negligible over the next 15 years thereby exacerbating the inaction on this issue. Biologically, ecologically, and legally it is wrong to continue to delay any serious consideration of the impacts of climate change on lynx and other wildlife simply because significant, or even moderate, impacts are not expected during the duration of a permit.

suggests that climate change may be an issue of concern for the future conservation of lynx because lynx distribution, and habitat is likely to shift northward or to higher elevation as temperatures increase (Gonzalez et al.2007).”

²⁶⁶ DEA at 118.

²⁶⁷ DEA at 119 citing Jacobsen et al. 2009, Whitman et al. 2010, Gonzales et al. 2007, Carroll 2007.

²⁶⁸ DEA at 76 citing Jacobsen et al. 2009, Whitman et al. 2010.

²⁶⁹ DEA at 76 citing Jacobsen et al. 2009.

²⁷⁰ DEA at 77 citing Jacobsen et al. 1999.

²⁷¹ DEA at 77 citing Gonzales et al. 2007.

²⁷² DEA at 119, 120

Now, not in 15 years, is the time for the FWS to give climate change and its impact on lynx, lynx habitat, lynx ecology and other wildlife proper and comprehensive consideration and to ensure that any conservation measures mandated in any ITP reflect the urgency of the impact both now and into the future.

There is no question that Maine's climate is warming as it has been for the past century. This warming has affected plant growing conditions resulting in a shift in horticultural plant hardiness zones in Maine by 1 zone to the north.²⁷³ In addition, the warming climate has resulted in an increase in deciduous forest in northern Maine²⁷⁴ and it is anticipated that areas of boreal forest could shift northward by as much as 200 kilometers by 2100.²⁷⁵ In the 2009 report *Maine's Climate Future*, the authors predicts "major changes in Maine's flora and fauna, increased wildfire, and changing precipitation and snow conditions that will greatly affect ecosystems within the next 100 years."²⁷⁶

In regard to the potential impact of climate change on lynx and marten, the DEA provides the following sobering assessment:

Lynx depend on extended periods (>4 months) of deep, fluffy snow, thus are vulnerable to climate change. Gonzales et al. 2007 estimated that up to 2/3 of potential lynx habitat could be lost in the lower 48 states by 2100, and Maine may lose its lynx population in the foreseeable future. ... Wildlife biologists expect that once annual snowfall declines below 270 centimeters per year (106 inches) for lynx (Hoving et al. 2005) and 192 cm/yr (76 inches) for marten (Krohn et al. 1995) these 2 species will decline and could eventually disappear from the state. ... Given these predictions, maintaining lynx habitat in Maine will require intensive natural resource management intervention.²⁷⁷

A graphic illustration of the potential impact of climate change on lynx is provided in 'Canada Lynx and Climate Change,' produced by the U.S. Fish and Wildlife Service. In that short fact sheet, a series of maps depicting average annual snowfall for Maine and surrounding states and Canadian provinces for the 1970s, 1980s and projected in the future

²⁷³ DEA at 119.

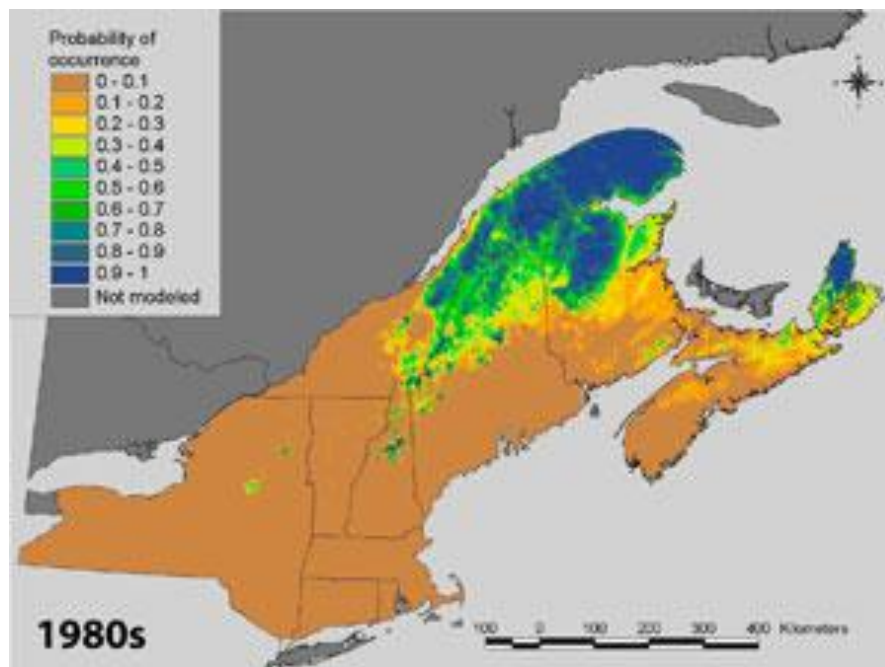
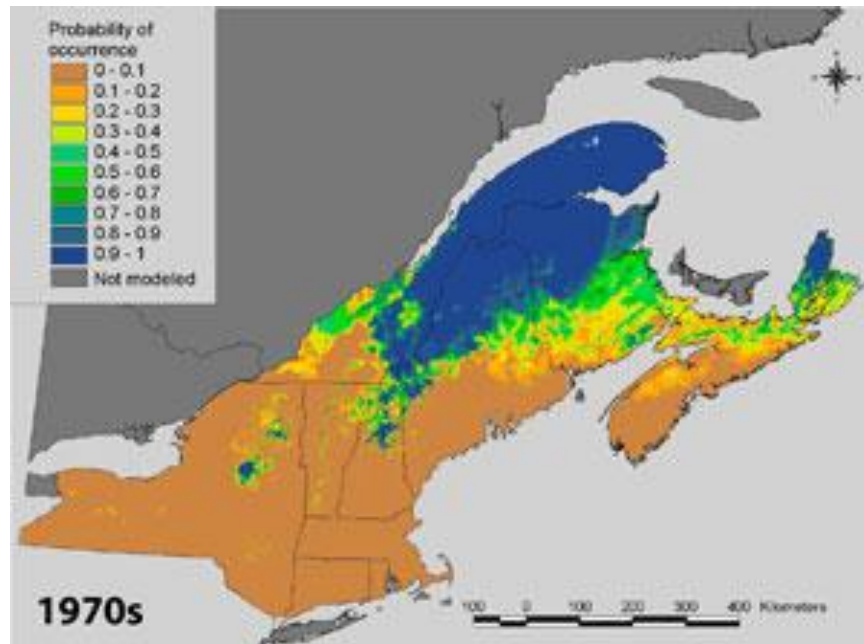
²⁷⁴ DEA at 119 citing Seymour 1992.

²⁷⁵ DEA at 119 citing Gonzales et al. 2007.

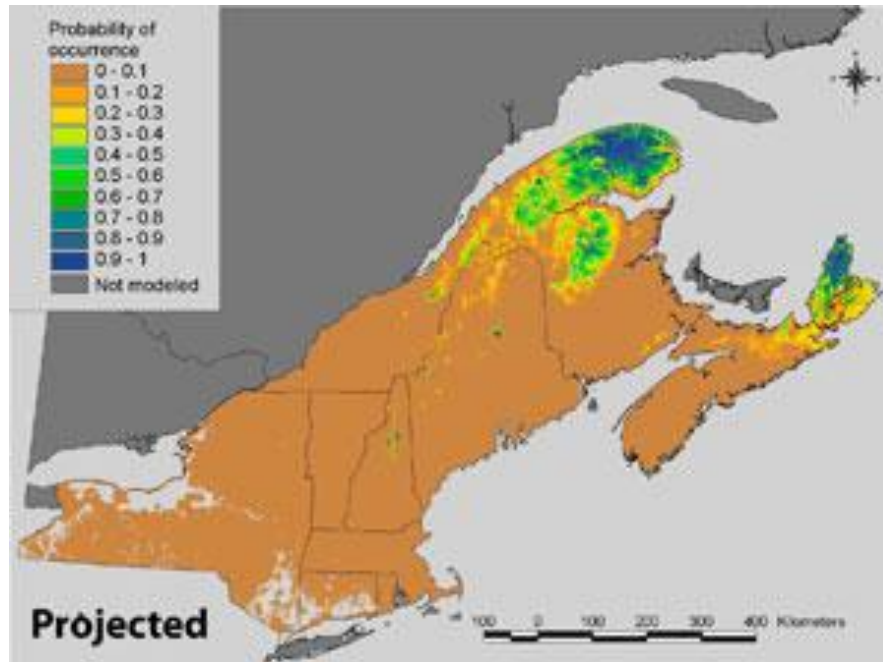
²⁷⁶ DEA at 119 citing Jacobsen et al. 2009.

²⁷⁷ DEA at 119 citing Gonzales et al. 2007; See also U.S. Fish and Wildlife Service, *Canada Lynx and Climate Change*, available at: <http://www.fws.gov/northeast/climatechange/stories/lynx.html>; "Lynx are uniquely sensitive to climate change based on their physical attributes." ... "Their preferred habitat requires at least 2.7 meters of average annual snowfall. If snowfall decreases, there may be almost no suitable habitat in Maine where the only verifiable lynx population on the East Coast exists."

document that snowfall accumulations are expected to decline significantly in Maine and elsewhere (see below).²⁷⁸



²⁷⁸ U.S. Fish and Wildlife Service, Canada Lynx and Climate Change, available at: <http://www.fws.gov/northeast/climatechange/stories/lynx.html>



Similarly, in an assessment of the impact of climate change and trapping on lynx, the DEA included the following:

Maine's population of lynx was more vulnerable to climate change than populations in New Brunswick and Gaspé, Quebec where there was greater elevation relief. Maine lynx populations were expected to decline by 59% by 2055 because of climate change. Lynx trapping in Quebec could increase vulnerability of Maine and New Brunswick's lynx populations, even though lynx are not trapped in the latter jurisdictions. Carroll found that an increase of 10% lynx harvested on the Gaspé region of Quebec could exacerbate the expected declines in Maine's lynx populations²⁷⁹ from climate change and habitat changes. Lynx population cycles would further reduce the likelihood of persistence of Maine's lynx population.²⁸⁰

Though not included in the DEA, additional information from Carroll (2007) regarding the combined impact of climate change, logging, trapping, and natural population cycles on marten and lynx is relevant to the analysis of cumulative impacts:

²⁷⁹ Some have suggested that Maine's lynx population originated in the Gaspé region of Quebec. AWI does not believe that the link between lynx populations in the Gaspé region and Maine has been conclusively proven and asserts that the evidence provided by Hoving (2001) as to this linkage is not conclusive.

²⁸⁰ DEA at 120 citing Carroll 2007.

Both species showed stronger declines in the simulations due to climate change than to overexploitation or logging. Marten populations declined 40% because of climate change, 16% because of logging, and 30% because of trapping. Lynx populations declined 59% because of climate change, 36% because of trapping, and 20% in scenarios evaluating the effects of population cycles. Climate change interacted with logging in its effects on the marten and with trapping in its effects on the lynx, increasing overall vulnerability. For both species larger lowland populations were vulnerable to climate change, which suggests that contraction may occur in the core of their current regional range as well as among smaller peripheral populations.

These results, as reported by Carroll (2007):

...illustrate the threats small and semi-isolated populations face at their range margins in the relatively near future, as climate change interacts with habitat conversion and direct exploitation (e.g., trapping) to form an extinction vortex (Gilpin & Soulé 1986). Exacerbating these threats, these populations span national boundaries with contrasting social and regulatory contexts.

Which, in turn, led Carroll (2007) to emphasize the need for precautionary management in light of such significant, cumulative, and long-term threats:

My results suggest that it will be difficult to sustain small peripheral populations (such as in Nova Scotia for the marten or Nova Scotia and northern Maine for the lynx) of either species in the face of climate change. The strong impact of climate change in the results imply not that conservation action to address other threats will be useless, but that it is essential to move toward more precautionary management of populations that may today still appear robust. Unless steps are taken now to bring more regionally coordinated management of these species, they may also suffer a range contraction in areas that are now considered the core of their regional range ... A key component of a precautionary management strategy will be improved monitoring of the response of populations to climate change and other stressors and an adaptive management policy concerning trapping harvest and habitat conservation.”

In assessing the interactions between these varied cumulative impacts, the FWS predicts that lynx habitat will continue to decline, forest land ownership will be unstable, energy, second-home and resort development will increase, and that trapping effort will decline.²⁸¹ This decline in trapping is due to, among other reasons provided by the FWS, trapper attrition and national trends away from the consumptive use of wildlife. Furthermore, changing land ownership, forest practices, development activities, and climate change will

²⁸¹ DEA at 119.

affect trapper activity, seasons, season lengths, and fur conditions. In the near term, these impacts may reduce trapper activity but there may also be an increase in trapper activity due to, for example, reduced snow providing increased trapper mobility. The FWS cautions, however, that “unless carefully managed, trapping, could place incremental stresses on furbearer species and incidentally-trapped species already affected by changing forest management, climate change, and development.”²⁸²

The FWS, in consideration of the cumulative impacts analysis, concluded that Alternative E “would have the least likelihood of exacerbating other stresses on lynx and other non-target wildlife as there would be no trapping of upland furbearing species in the northern part of the state.”²⁸³ Conversely, Alternatives A and B “would result in the greatest incidental take of lynx” but, the FWS claims that the “degree to which incidental trapping of lynx would exacerbate anticipated or ongoing lynx population declines from other stressors (hare fluctuations, habitat declines, climate change) is unknown.”²⁸⁴ In fact, though it may not be precisely quantifiable, the cumulative impact of trapping to lynx subject to the litany of other stressors is undoubtedly negative since trapping mortality, harm, and harassment must be additive to the mortality, stress, and harm that is and/or will impact the species as a consequence of climate change, forest practices, development, land ownership patterns, and a host of other stressors.

What the FWS did not include in its cumulative impact analysis is any type of effort to model the cumulative impacts to lynx and other wildlife species to provide some predictions, even if based on educated guesses, of how these populations may fare in the future given the expected effects of all of the factors referenced above. While the FWS’s evaluation of each Alternative in the context of cumulative impacts is interesting, it provides nothing more than a broad brush assessment of the impacts. Actually quantifying those impacts would have been more valuable and informative.

The foregoing information is not new as most of it is contained, as it should be in the DEA. What is critical to understand from this analysis is that of these factors that, either today or in the future, will impact lynx and their habitat (and other wildlife) some are under our control and some less so. We can control or regulate development, forest management, and may be able to temper a reduction in conservation-minded management as a result of changing land ownership trends. We can also, obviously, control trapping and the incidental take of lynx and other wildlife using an assortment of strategies and tools. What is more difficult to control – and can’t be remedied through this decision-making process – is the severity and impact of climate change on Maine, its northern forests, and its wildlife. Consequently, it is more important than ever that, as the impacts of climate change become increasingly pervasive in Maine, nationally, and globally, we make every effort to

²⁸² DEA at 119.

²⁸³ DEA at 121.

²⁸⁴ DEA at 121.

minimize human-caused stressors to our wildlife and wild lands in order to, among other benefits, improve an ecosystem's (and its inhabitants) resilience to climate change. This then provides a compelling basis to remove trapping as a stressor to lynx and other wildlife in northern Maine by imposing a prohibition on all upland/dryland trapping (Alternative E) in any ITP issued to the MDIFW.

Moreover, given these longer-term threats, it is imperative that the FWS recognize that MDIFW intends to authorize trapping over a longer duration than simply the 15-year duration of the requested ITP. As a consequence, even though the ITP may only be valid for 15 years (or as recommended previously 7 years due to the potential for environmental/habitat changes), the FWS analysis should be based on a broader or longer look at the impacts of the requested ITP. By taking such a far-sighted approach, the FWS's analysis would more accurately account for the effects of climate change and other long-term threats to Maine's lynx population and, in turn, allow for a more robust calculation of the levels of permissible lethal and non-lethal take in light of virtually certain declines in lynx population and habitat. Indeed, not only would such an approach present the cumulative effects in a more accurate manner in view of the long-term baseline condition of the species, but it would also ensure that the Service's jeopardy analysis considers and examines the long-term impact of trapping and whether it, combined with other threats, will "reduce appreciably the likelihood of both the survival and recovery" of lynx in Maine.²⁸⁵

An EA is inadequate to comprehensively evaluate the full range of environmental impacts of the action; an EIS is required:

AWI and PC have previously indicated in this letter that an EIS is required to comprehensively evaluate the direct, indirect, and cumulative impacts of the proposed issuance of an ITP to Maine to permit the incidental take of protected lynx. This position is not based on any intent to slow down the decision-making process – indeed if anything AWI believes that a prohibition or significant restrictions on trapping in lynx occupied habitat in Maine should have been enacted long ago as required by the ESA – but rather to ensure that all of the impacts of this action are fully considered as required by NEPA. In order to achieve both benefits that will reduce the impact of trapping on lynx in Maine while also ensuring that an EIS is prepared, AWI and PC offered the option of issuing an interim ITP containing a suite of required conservation measures while also directing the MDIFW to prepare a revised and improved ITP application/HCP to remedy the numerous

²⁸⁵ 50 C.F.R. § 402.02; A recent court decision found this kind of temporal segmentation of a jeopardy analysis to be unlawful because "[t]here could be some impact, but not an appreciable impact, in each of several subdivided periods of operation that, in cumulation, have an undeniably appreciable impact," meaning that "[a] series of short-term analyses . . . could mask the long-term impact of" incidental take authorized by the Service. *Wild Fish Conservancy v. Salazar*, 628 F.3d 513, 523 (9th Cir. 2010).

deficiencies in its current application and for the FWS to subject that revised document to review in an EIS.

As indicated by the FWS, it can utilize an EA either as a stand alone analysis of the environmental impacts of an action or the EA can be a tool to determine if an EIS is necessary. Alternatively, agencies routinely avoid the time and expense of preparing an EA altogether when it is clear that a particular action will require analysis in the form of an EIS. In making that determination, the agency is required to evaluate the significance of the impacts of the action on the human environment. Under NEPA, significance is considered both in regard to the context of the action (i.e., significance to society as a whole, the affected regions, the affected interests, and the locality) and the intensity of the impact. 40 CFR 1508.27. In this particular case, given the precedence set by this analysis – as the first ITP application/HCP to address the relationship between recreational trapping and lynx protection – the context of the action clearly warrants an EIS. Even if this were not the case, the intensity of the impacts inherent to the action being considered justify the preparation of an EIS.

The CEQ regulations implementing NEPA, identify ten intensity factors that an agency is to consider when determining what level of NEPA analysis is applicable to its project. An EIS is warranted if the project triggers, satisfies, or exceeds even one of the intensity factors. In this case, the Maine ITP application/HCP clearly meets or exceeds all or nearly all of the ten intensity factors as explained below.

1. Impacts that may be both beneficial and adverse.

Given the range of alternatives considered in the DEA, it is clear that depending on the decision the impact to lynx could be either beneficial or adverse. If Alternative E is selected, the impact to lynx would be highly beneficial by prohibiting upland/dryland trapping in lynx occupied range. The impact to trappers and the MDIFW, however, could be adverse. If Alternative A were selected, the situation would be reversed. Furthermore, given the deficiencies in the Maine ITP application/HCP which prevented the FWS from being able to understand and analyze all potential implications of the issuance of an ITP, there remain questions as to how many of the components of the plan would impact lynx and lynx habitat.

2. The degree to which the proposed action affects public health or safety;

This issue is not adequately addressed in the DEA. Though lynx occupied habitat in northern Maine is considered remote in its characteristics and though much of that habitat is found on private land, the beauty of the region likely attracts persons who enjoy various recreational activities in the region including hiking, bicycling, camping, observing nature, walking dogs, off-road vehicle recreation, skiing, snowshoeing, and snowmobiling.

Theoretically, though the chance may be slim, these persons could be harmed if they were to step on or in a trap. A more likely incident that would result in harm would be if a persons dog was caught in a trap which could result in injury or mortality to the animal and significant trauma to his or her human companion.

3. Unique characteristics of the geographic areas such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas:

The description of the affected environment in the DEA does not provide sufficient detail to know if such unique areas exist within the project area. There is a proposal to establish a national park in northern Maine but said park has not been officially created. Nevertheless, given the remoteness of northern Maine, former occupation of the area by one or more native tribes, it is likely that the area includes certain unique characteristics that would satisfy this intensity standard.

4. The degree to which the effects on the quality of the human environment are likely to be highly controversial:

While ideally there should be no controversy in taking all steps required to protect and recover lynx in Maine, those restrictions already placed on trappers actively trapping within occupied lynx habitat and any additional mandates established through the ITP process will be highly controversial particularly to trappers, their allied organizations, and the MDIFW. As indicated by the reluctance of the MDIFW – an agency that had to be sued to even obtain some restrictions on trappers in occupied lynx habitat -- to consider any further restrictions on trapper in lynx occupied habitat (i.e., preferring to confer with trappers if future incidental takes happen rather than enacting substantive and concrete measures to prevent or minimize their occurrence), it, trappers, and trapping organizations will find any further restrictions imposed by the FWS to be highly objectionable and controversial. Conversely, if additional restrictions are not imposed on trapping in the region to end or mitigate the routine captures of lynx in violation of the ESA, conservationists will find the lack of action to be highly controversial.

5. The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks:

Considering the significant gaps or deficiencies in the Maine ITP application/HCP, at this time many of the potential impacts of the issuance of the ITP are highly uncertain and involve unknown risks. For example, the proposal to mitigate incidental takes of lynx by creating 5,000 acres of lynx habitat does not contain requisite detail, as reported by the FWS itself, to understand where such habitats will be created, how they will be created, over what time frame, and, consequently, whether they will actually function as productive

lynx habitat. This is just one of many examples of uncertain effects and unknown risks inherent to the Maine ITP application/HCP as current drafted.

6. The degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration:

This action is precedent setting both regionally and nationally. Regionally, this decision-making process represents a test for the FWS and its responsibility to enforce the ESA, to ensure the recovery of protected species, and to do everything in its power to accomplish the mandates of the ESA. Consequently, decision made in this case will represent a standard that will be applicable throughout Maine in the event that lynx expand their range or if evidence indicates that another federally ESA protected species is impacted by trapping. Furthermore, given the potential incidental take of migratory birds and eagles in traps, decisions made here in regard to the provision of the MBTA or BGEPA also will be precedent setting. Nationally, the precedent to be set by this decision is also real since this will not be the last ITP/HCP prepared to address the incidental taking of protected species by trappers. Indeed, the state of Minnesota is addressing the same issues as Maine and reportedly carefully monitoring the ITP process in Maine as a foundation for its own draft ITP application/HCP.

7. Whether the action is related to other actions with individually insignificant but cumulatively significant impacts:

Given the noted deficiencies in the ITP application/HCP it is difficult to determine if the action, once all effects are considered will meet this standard. However, what it clear is that depending on the decision ultimately made by the FWS, there could be repercussions that would provide benefits to other species and which may be cumulatively significant. For example, if the FWS selects Alternative E thereby prohibiting upland/dryland trapping within lynx occupied habitat, there would be significant benefits to those non-target species, including eagles and other migratory birds, that otherwise would be trapped, harmed, and killed if Alternative E is not selected.

8. The degree to which the action may adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources:

There is not sufficient information about such characteristics of the project area in the DEA or Maine ITP application/HCP to determine if this intensity factor would be met as a result of this action. What is known is that the lands in question were once tribal lands so it is possible that culturally important sites and resources may exist on the lands and could be adversely affected by trapping activities.

9. The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973:

Depending on the action taken, the impacts could either benefit the lynx by significant restricting or prohibiting upland/dryland trapping in their occupied habitat or could be adverse to lynx if trapping is allowed to continue with little to no further restrictions. At present, even with additional restrictions imposed through regulatory changes (compelled by legal action), threatened lynx continue to be incidentally trapped and, in some cases, killed, in violation of the ESA.

10. Whether the action threatens a violation of Federal, State, or local law or requirements imposed for the protection of the environment.

If the FWS elects to issue an ITP without requiring conservation measures that substantively impose far more restrictive standards on trapping activities in occupied lynx habitat, then the action taken will clearly violate the ESA. Furthermore, should it issue an ITP prior to the MDIFW complying with the terms of the MBTA and BGEPA to protect eagles and other migratory birds from incidental capture in traps, its actions will violate those federal laws.

Consequently, based on this evidence, the FWS must either terminate the current decision-making process and initiate preparation of an EIS or commit to the preparation of an EIS upon receipt of a revised and improved ITP application/HCP from MDIFW. If the latter option is chosen, it is imperative that the FWS, preferably, either prohibit upland/dryland trapping entirely from lynx occupied habitat to prevent ongoing violations of the ESA or issue an interim ITP with strict conservation measures (as identified in this letter) to reduce the potential for illegal takes of lynx pending a final decision at the conclusion of an EIS decision-making process.

Endangered Species Act:

In order to obtain an ITP, the MDIFW must comply with the requirements of Section 10 (a)(2)(A) and (a)(2)(B) of the ESA. This section specifies that, for the FWS to issue an ITP, it must find that the MDIFW has submitted a “conservation plan” that specifies:

- (i) the impact which will likely result from such taking;
- (ii) what steps the applicant will take to minimize and mitigate such impacts, and the funding that will be available to implement such steps;
- (iii) what alternative actions to such taking the applicant considered and the reasons why such alternatives are not being utilized; and

(iv) such other measures that the Secretary may require as being necessary or appropriate for purposes of the plan.

Then, pending public an opportunity for public comment, the FWS is authorized to issue the ITP if it concludes that the MDIFW's ITP application/HCP satisfies the following criteria:

- (i) the taking will be incidental;
- (ii) the applicant will, to the maximum extent practicable, minimize and mitigate the impacts of such taking;
- (iii) the applicant will ensure that adequate funding for the plan will be provided;
- (iv) the taking will not appreciably reduce the likelihood of the survival and recovery of the species in the wild; and
- (v) the measures, if any, required under subparagraph (A)(iv) will be met; and he has received such other assurances as he may require that the plan will be implemented.

In issuing the ITP, the FWS can include "such terms and conditions" as is "necessary or appropriate to carry out the purposes of this paragraph, including, but not limited to, such reporting requirements" as the FWS "deems necessary for determining whether such terms and conditions are being complied with."

The following review of these requirements in the context of the MDIFW ITP application/HCP demonstrates that the MDIFW has not satisfied these basic standards for FWS issuance of the requested ITP. As an initial matter, the ESA requires that, in considering an application for an ITP and in formulating an accompanying HCP with the applicant, the Service must ensure that its review of the application is based on the "best scientific . . . data available;"²⁸⁶ a standard that the MDIFW has failed to meet. Consequently, until and unless, the MDIFW can provide an ITP application/HCP that satisfies each of the criteria contained in the ESA, the FWS cannot issue an ITP.

As indicated above, the MDIFW's application must satisfy four basic criteria. Each criterion is identified and information is provided as to whether, in this case, the MDIFW has met its legal obligation.

- (i) the impact which will likely result from such taking;

Though the MDIFW concedes that it does not have an accurate or precise estimate of the number of lynx in Maine, that it has no accurate estimate of the actual number of lynx incidentally trapped (and therefore does not know the sex or age of trapped animals), and despite compelling evidence (primarily based on the loss or degradation of lynx habitat and

²⁸⁶ See 16 U.S.C. § 1536(a)(2).

population decline of primary prey) that its lynx population is declining, it contends that trapping is having no meaningful impact on the lynx population. Consequently, the MDIFW asserts, based on the results obtained from a seriously flawed deterministic model, that the requested authorization for the incidental take of lynx (3 adult and 2 juvenile mortalities over 15 years) will not adversely impact the lynx population.

As indicated above, the MDIFW's deterministic model cannot be used as a basis for determining what impact the issuance of the requested ITP will have on the lynx population. Even though the MDIFW ran the model with female carrying capacities ranging from 25 to 1000, the model's demographic parameters were all based on data collected when Maine's lynx population was at or near its peak. As a consequence, the data used for the proportion of females pregnant, the mean litter size, and the survival or mortality rates reflect a lynx population at a peak in its cycle and not one that is diminished, surviving at a low density, without significant reproduction or recruitment. Considering that Maine's lynx population recently has suffered the consequences of declining snowshoe hare densities (their primary prey), as even the MDIFW's own data demonstrates and its biologists report, the MDIFW's failure to model the impacts of its anticipated incidental take under the population demographics of both a high and low density lynx population is inexplicable. Had it done so, the model results would have provided an entirely different picture of how its requested authorization for the take of 5 lynx over 15 years may have impacted the population at times of high, declining, and low density.

Furthermore, as explained above, the MDIFW's requested take levels are either too high or too low depending on the specific category of take. Its request for an overall incidental lynx trapped at 11 plus 20 percent would, if granted, allow a level of total take never before reported in Maine. Why the MDIFW used the highest annual reported take rate between 1999 and 2011 (i.e., 11 lynx trapped in 2004) as the basis for this request instead of basing the request on an average take over all 13 years is unclear as is the MDIFW's request to increase the take by an additional 20 percent. Conversely, its request to permit up to 3 adult and 2 juvenile lynx to be killed by trappers over 15 years is too low considering that a minimum of seven lynx are known to have been killed, directly or indirectly, by trappers over 13 years. This is not to suggest that the request should be raised since the lower the requested take the more incentive there is for the MDIFW to ensure that level of take is not reached to avoid violating the terms of the requested ITP, but that the amount of take must be set at a realistic level in order to adequately assess how that take will impact the population and, therefore, whether the ITP can be granted. Indeed, if the requested ITP had been issued in 2010, the documented lynx mortality in 2011, particularly if that animal was a female, would have placed Maine within 1 additional mortality (of an adult male) of what would be the maximum permissible lethal take.

In addition, a fundamental flaw in the MDIFW's ITP application is that the requested take authorizations are based on reported, not actual, take. Since there is no evidence to suggest that there is 100% (or anywhere near that amount) of compliance with Maine's mandatory reporting requirement for incidentally trapped lynx, the actual amount of take (lethal and non-lethal) may be far higher than what's been documented in the past or what has been requested as a standard in the ITP application/HCP. The MDIFW made no effort to compensate for unreported take – whether it be in the form of unreported killed lynx or lynx that are harmed and harassed as a consequence of being trapped -- when setting the lethal take levels contained in its ITP application/HCP.

(ii) what steps the applicant will take to minimize and mitigate such impacts, and the funding that will be available to implement such steps;

Besides the actions that it is already taken, many of which were compelled by litigation, to reduce the number of lynx incidentally trapped in Maine, the MDIFW only considers two other actions to minimize and mitigate the incidental take of lynx. The first is a proposed rule (which in the intervening years since the ITP application/HCP has been promulgated) that requires the use of lynx exclusion devices on ground sets of Conibear traps with 7-1/2 inch or less jaw spread (or #220) in WMDs 7, 14, 18, and 19. This is an important change to Maine's trapping regulations but it is inexplicable why the same requirement is not applicable to WMDs 1-6 and 8-11.

The second is the creation of 5,000 acres of snowshoe hare and lynx habitat on public lands in Maine as mitigation for the requested authorization to lethally take 5 lynx over the 15 year duration of the ITP. These measures, if implemented, would be in addition to strategies (i.e., dialog with trappers, restrictions on trap size within lynx occupied range, trapper training, lynx hotline for reporting trapped lynx, maintaining a list of veterinarians/rehabilitators for injured lynx, mandatory reporting of lynx captures, distribution of trapping educational material, on-site assistance to check and release trapped lynx) that have already been implemented by the MIDFW.

While these additional minimization measures are appreciated, they will not stop the incidental take of lynx as a result of trapping in lynx occupied habitat. Such takes, at present, are each a violation of the ESA. If the ITP were granted, a certain amount of take would not violate the ESA but anything in excess of that amount, would. Consequently, though the lynx excluder devices may reduce the potential for lynx to be captured in a Conibear trap, they will still be susceptible to capture in foothold traps set in their range. Moreover, had MIDFW been committed to reducing all potential take of lynx in Conibear traps, it could have and should have prohibited the use of Conibear traps entirely from lynx range. This would have significantly benefited lynx and other wildlife (target and non-target) susceptible to capture in Conibear traps without substantially reducing trapping opportunities statewide.

In regard to the establishment of mitigation lands to compensate for lynx mortalities, the proposal made by the MDIFW is a start but it has failed to disclose, as indicated by the FWS in the DEA, sufficient details about this strategy. Such details include how this strategy would be implemented, when, where it would be located, how quickly it could be accomplished, how the areas would be managed, and whether there would be legally binding agreements reached to ensure that it is available for snowshoe hare, lynx, and other wildlife in perpetuity. Without such details the merits of this proposal simply can't be evaluated.

Finally, though the MDIFW claims that funding will be available to implement the ITP, whether that funding is secure and/or that it will be consistently available throughout the duration of the ITP is unclear. The application does not contain enough information to assess whether funding is adequate and does not provide a method for monitoring compliance of funding commitments.²⁸⁷

According to estimates provided in the ITP application/HCP, the cost of the ITP (if granted as requested) would be \$22,600 per year plus per event costs of \$500 for trap improvement and \$1,000 for each consultation with FWS and Maine Trapping Association when incidental catch rates reach certain trigger points.²⁸⁸ These costs would be in addition to ongoing salary, benefits, pension costs for MDIFW employees who would be engaged in lynx/trapping management work. While this additional cost is likely only a fraction of the MDIFW overall budget, the MDIFW does not disclose the anticipated source of these funds.²⁸⁹ It does, however, include information in its ITP application/HCP of example of funding deficiencies in the past and it identifies alternative means of complying with the terms of the ITP (if granted) if funding were reduced or not available. Examples of these concessions include:

- Due to budgetary shortfalls in 2007 the trapper information pack was not mailed to every licensed trapper. Instead, a letter was sent to every trapper informing them that the information was available on-line and that printed copies would be sent to anyone without Internet access²⁹⁰;

²⁸⁷ The HCP Handbook states “whatever the proposed funding mechanism is, failure to demonstrate the requisite level of funding prior to permit approval or to meet funding obligations after the permit issued are grounds for denying a permit application or revoking or suspending an existing permit respectively.” Pg. 3-35

²⁸⁸ ITP application/HCP at 125-127.

²⁸⁹ The MDIFW does provide information on the source of past and future funding for its Canada lynx research project but it is unclear if those funds (including monies from state wildlife grants, forest industry, Section 6 funds, conservation license plate funds, and grants from NGOs) would be used or available for funding implementation of the ITP. ITP application/HCP at 124.

²⁹⁰ ITP application/HCP at 78.

- If there were a change in MDIFW's funding status, Maine's trapper education program could be affected by volunteer instructors receiving less oversight and instruction materials not being kept up-to-date²⁹¹;
- A funding shortfall in MDIFW may impact plans to use a time series analysis of Landsat imagery to map change of lynx habitat. This would affect the Department's ability to determine the carrying capacity of the habitat in northern Maine to support lynx and snowshoe hare²⁹²;
- Funding shortfall could result in population/habitat surveys being delay or terminated. If surveys were terminated, MDIFW would have to rely on habitat maps for assessing changes in carrying capacity for snowshoe hares or lynx and would have a limited ability to confirm habitat use or changes in populations²⁹³;
- A funding shortfall in either the wood product industry or in MDIFW may impact plans to use a time series analysis of Landsat imagery to map change of lynx habitat. This would affect the Department's ability to determine the carrying capacity of the habitat in northern Maine to support lynx and snowshoe hare.²⁹⁴ 140

This is evidence of the potential of a funding shortfall at some point in the future, which could either jeopardize the ITPs implementation or diminish the effectiveness of the conservation measures that would be required in an ITP. Since this ITP criteria specifies that the funding must be available (i.e., "and the funding that will be available to implement such steps"), if there's any inkling that the necessary funds may not be available – as is the case here – the ITP cannot be issued.

(iii) what alternative actions to such taking the applicant considered and the reasons why such alternatives are not being utilized; and

The MDIFW considered a variety of other alternative actions or minimization measures in its ITP application/HCP that would have reduced the incidental take of lynx by trappers in Maine. It, however, dismissed nearly all either based on its claim that such changes were not warranted given alleged existing low risk of incidental trapping of lynx, that they would be difficult to implement or enforce, that they would impose an unacceptable economic burden on trappers, or that they would simply be inconvenient for trappers. Consequently, potential minimization measures like prohibiting or further restricting Conibear traps, prohibiting drags on foothold traps, reducing the length of the trapping season, requiring trappers to acquire new traps, and regulating the number of trappers or traps that could use or be set in lynx range were all considered yet rejected for one or more of the reasons stated

²⁹¹ ITP application/HCP at 148.

²⁹² ITP application/HCP at 140.

²⁹³ ITP application/HCP at 141, 142.

²⁹⁴ ITP application/HCP at 140.

previously. While, in some cases, the MDIFW's rejection of the alternative minimization measure may have been appropriate, its rejection of all demonstrates an unwillingness to recognize the seriousness of this problem, a reluctance to embrace its responsibilities to protect and recover lynx, and its bias in favor of trappers and other "consumptive" users.

(iv) such other measures that the Secretary may require as being necessary or appropriate for purposes of the plan.

The MDIFW did not address this criteria as it is the prerogative of the Secretary of the Interior, through the FWS, to articulate such "other measures." However, considering that this ITP application/HCP may likely be the fifth iteration of the document, it is worth noting that the FWS has provided direction, guidance, and comments on previous versions of the ITP application/HCP and, while some of its recommendations were incorporated by the MDIFW, others were ignored or, otherwise, not addressed by the MDIFW. The MDIFW's failure to remedy those deficiencies brought to its attention by the FWS may be relevant in the analysis of this criterion.

Based on the foregoing analysis and other information contained in this comment letter, if the FWS objectively answers each of the criteria that it must evaluate prior to issuing an ITP or rejecting an ITP application/HCP, it would have to conclude that the MDIFW ITP application/HCP is insufficient and does not meet the ESA requirements. Considering that the FWS identifies a variety of significant deficiencies in the ITP application/HCP in the DEA, it would appear that the FWS would not even have to engage in an analysis of these ITP criteria before rendering its decision. For the benefit of the FWS, however, each of its criteria are considered and evaluated in the context of the information contained in the ITP application/HCP below:

(i) the taking will be incidental;

As there is no evidence that the MDIFW is encouraging trappers to trap lynx, it would appear that any lynx who are trapped are trapped incidentally. However, considering that the MDIFW could – and should – enact more restrictive regulations and policies to reduce the potential for lynx to be trapped incidentally, it could be argued that this failure to do everything in its power to reduce incidental take is a defacto authorization to take lynx incidental to trapping.

(ii) the applicant will, to the maximum extent practicable, minimize and mitigate the impacts of such taking;

The available evidence, summarized below and referenced in other sections of this comment letter, provide overwhelming evidence that the MDIFW has not, even to a minimum extent not to mention the required maximum extent practicable, endeavored to

minimize and mitigate the impacts of the incidental trapping of lynx. Indeed, instead of putting the protection and conservation of lynx first (as is mandatory under the ESA), the MDIFW has chosen instead to avoid inconveniencing trappers, imposing new restrictions on trapping activities, or pursuing alternatives that may anger its trapping constituents. It must also be noted that the existing restrictions and/or measures that are in place to reduce the potential incidental capture of lynx were, with some exceptions, not voluntarily enacted by the MDIFW. Instead, the most significant of the restrictions (e.g., restrictions on size of foothold traps, prohibition on snares, leaning sets for Conibear traps) were enacted as a result of either litigation or in response to more lynx being trapped (e.g., the recent enactment of a rule requiring lynx exclusion devices was in response to yet another lynx recently captured and killed in a Conibear trap.²⁹⁵

The assessment of minimization and mitigation measures is of particular importance in any ITP application/HCP since it sets forth what options may be available to provide protections to the federally listed species and why those options either are or, are not, justified. Section 10 of the ESA requires that, prior to issuing an ITP, the FWS must find that “the applicant will, to the maximum extent practicable, minimize and mitigate the impacts of such taking.”²⁹⁶ In the FWS’s own HCP handbook, the agency states, “[the FWS] ultimately decide[s], at the conclusion of the permit application processing phase, whether the mitigation program proposed by the applicant has satisfied this statutory issuance criterion.”²⁹⁷ Where, however, the agency simply defers to the ITP applicant’s findings that certain mitigation or minimization measures are not practicable, the FWS violates its duty under Section 10 to independently make a practicability finding.²⁹⁸

The following provides a summary (in no particular order) of each of the minimization measures/alternatives considered by the MDIFW, its rationale for not implementing them, and an assessment of that rationale. As a preface to that analysis, it is worth noting that many of the existing measures, some of which cannot be classified as minimization or mitigation tools, are in place ostensibly to reduce the possibility of a lynx will be incidentally trapped and/or to provide care for lynx who are captured and sustain injuries are warranted and should continue to be implemented by the MDIFW. Such measures include the lynx hotline (to report incidentally trapped lynx), an lynx injury assessment guideline (to aid biologist in attempting to assess the injury status of a trapped lynx, conferring with trappers at events/meetings, mailings to trappers containing relevant

²⁹⁵ This new rule, which is addressed in the 2011-2012 MDIFW Trapper Information booklet (and elsewhere) only requires the use of exclusion devices on Conibear traps with a 7-1/2 inch or less jaw spread (#220) in ground sets in WMDs 7, 14, 18, and 19. While lynx are found in those WMDs, they also occur in WMDs 1-11 yet, inexplicably, this regulation does not cover those WMDs.

²⁹⁶ 16 U.S.C. § 1539(a)(2)(B)(ii).

²⁹⁷ FWS, HCP Handbook at 7-3, available at http://www.nmfs.noaa.gov/pr/pdfs/laws/hcp_handbook.pdf.

²⁹⁸ See *Gerber v. Norton*, 294 F.3d 173, 184-85 (D.C. Cir. 2002) (finding that “the Service was obliged to find *independently* that no practicable alternative to [the applicant’s] development plan would minimize the taking of” the listed species at issue in that case) (emphasis added).

informational/educational materials, development and implementation of standard operating procedures for handling incidentally caught lynx, providing recognition to trappers who do report captured lynx, conferring with other jurisdictions on incidental take issues, and maintenance of a contact list for veterinarians and rehabilitators²⁹⁹ are all important and should continue to be implemented and expanded by the MDIFW.

Other existing measures such as restricting use of visible bait, requiring Conibear traps to be set on leaning poles, and the mandatory reporting of lynx captures, though potentially beneficial in theory, are not always the same in practice. For example, the restriction on visible bait is only applicable to birds (i.e., visual from the air). Bait or lures/scents can still be used in traps set on the ground or in trees as long as it is covered. Consequently, these traps remain at risk of capturing lynx and other non-target species. As indicated in the DEA, allowing Conibear traps to only be set on leaning poles does not eliminate the potential for a lynx to be captured and, based on experiments being conducting using a captive lynx, the FWS is demonstrating that small poles and/or poles at a 45 degree or even steeper angle are not necessarily off limits to lynx.³⁰⁰ Finally, as previously expressed, and as conceded by the MDIFW, we don't know how many lynx are actually being taken but we are certain that the mandatory reporting requirement is ignored by a proportion of the trapping community.

Outreach and education efforts: Education efforts are intended to reduce non-target captures of lynx. The MDIFW requests that trappers avoid setting traps for canids where there is abundant lynx sign, provides information on recognizing lynx and lynx sign, and engages in ongoing dialog with trappers.³⁰¹ This is an ongoing MDIFW program.

Assessment: Ongoing trapper education is important and valuable in an effort to reduce non-target captures of lynx. Unfortunately, based on continued non-target captures of lynx the efficacy of these efforts in minimizing incidental captures of lynx is unclear. Nevertheless trapper education programs must continue and should be expanded to require that all trappers, including non-residents, take a mandatory trapper education course and routine refresher courses. In addition a rigorous test should be developed which trappers have to pass in order to obtain a license. The MDIFW must also recommend that trappers not set traps for mustelids or employ any trap that could capture a lynx if there if lynx are seen or if there is lynx sign in an area.

²⁹⁹ ITP application/HCP at 74, 75, and 101.

³⁰⁰ DEA at 16; referring to FWS investigation of lynx susceptibility to capture in leaning pole Conibear sets and the ability of lynx to ascend leaning poles that are at a greater than 45 degree angle and to ascend vertical trees. This raises questions about the suitability of the current Conibear regulations since lynx would still be susceptible to incidental capture even if Conibear traps were set entirely consistent with the regulation.

³⁰¹ ITP application/HCP at 85.

Discontinue trapping statewide: The MDIFW dismisses this option by claiming that “trapping cannot be replaced with an alternative activity that effectively harvests furbearing animals and provides a similar outdoor recreational experience.”³⁰² It also notes no evidence of lynx being caught in traps set for beaver, raccoon, mink, skunk, or weasel suggesting that a statewide ban on trapping would be unreasonable.

Assessment: This claim cannot be substantiated with any evidence. While the MDIFW clearly adheres to a utilitarian view of wildlife that allows for its consumptive use and though it has an economic incentive in allowing and promoting such use, to claim that trapping should continue because there is not other similar outdoor recreational experience is nonsense. As evidenced by an ongoing downward trend in trapper numbers, societal values, interests, and recreational pursuits are changing and trapping, in time, will be a victim of this societal progression. This claim does, however, demonstrate that MDIFW recognizes that there is little biological necessity for trapping; that its justification is based on recreation alone. As indicated by the FWS in the DEA, “trapping may not be necessary to regulate wildlife populations as there are other natural checks and balances (e.g., disease, predation, competition, food limitations, and stochastic events) that limit populations.”³⁰³ While it is unexpected that the FWS would support this as a minimization measure in the ITP, it must not rule it out based on any concern for there not being other outdoor recreational opportunities

Discontinue trapping in selective WMDs: MDIFW reports that discontinuing trapping in all WMDs 1-11 for canines, marten, fishers, and bobcat would reduce statewide trapping harvest for marten by 86%, fisher by 35%, coyote by 31%, red fox by 31%, and bobcat by 5%. However, MDIFW concedes that coyote and fox are hunted as well so a prohibition on trapping in selective WMDs would not reduce overall kill rates by the estimated 31 percent. This minimization measure was dismissed based on the MDIFW’s conclusion that it is not practical to ask public to incur a significant loss of fur trapping opportunity on the outside chance that a lynx may incidentally be killed in a trap set for upland furbearers.³⁰⁴

Assessment: The reality is that the chance of a lynx being incidentally trapped is far more likely than the “outside chance” criteria assumed by the MDIFW. Over the past 13 years, there have been 60 lynx incidentally trapped and at least six died as a direct or indirect result of trapping. This, of course, only reflects the number of lynx reported to the MDIFW. No one knows what the actual number of lynx is that were trapped, how many were injured, how many were seriously injured, or how many died. We do know, however, that the “shoot, shovel and shut up” attitude is practiced by some members of Maine’s trapping fraternity. The fact that the lynx is

³⁰² ITP application/HCP at 128.

³⁰³ DEA at 78.

³⁰⁴ ITP application/HCP at 129.

a federally protected species and, considering the precautionary principle, the MDIFW should always give the benefit of the doubt to the lynx when making management decisions and placing the protection and recovery of the lynx over the interests of trappers or kill rates for furbearers.

Furthermore, the claim that closing selective WMDs to trapping would diminish the kill rates for furbearers ignores the fact that trappers could elect to trap elsewhere versus not trapping at all. Such a transition to alternative trapping areas would reduce the impact of selective closures on kill rates though, admittedly, it would increase the need for MDIFW to more carefully monitor kills to prevent an excessive kill of any species in these alternate trapping areas.³⁰⁵

Shorter tending times for Conibear traps: This measure, if implemented, would require trappers to check Conibear traps more frequently in order to reduce the probability of lynx mortalities or severe injuries if a lynx were captured in a Conibear trap. MDIFW indicates that the 5-day tending time for Conibear traps set in unorganized areas was instituted to allow trappers to check traps only on weekends and to give trappers running multiple trap lines or traveling long distances more flexibility as to when to check their traps.³⁰⁶ In addition, the 5-day check time is convenient to young trappers who attend school during the week. MDIFW dismissed this alternative based on its claim that the new Conibear regulations (i.e., leaning pole set requirements) implemented in 2007 virtually eliminate the risk of lynx becoming incidentally caught in these traps and, consequently “there is no rationale for shortening Conibear tending times to benefit lynx.”³⁰⁷ It claims that if Conibear traps are placed as recommended in the instructional booklet published by the FWS and the International Association of Fish and Wildlife Agencies (now the Association of Fish and Wildlife Agencies), lynx will be deterred from investigating the trap.³⁰⁸

Assessment: Though the 2007 regulations reduced the risk of lynx being incidentally caught in Conibear traps, it did not eliminate the possibility altogether as even the FWS indicates in the DEA and as has now occurred with the reported death of a lynx caught in a Conibear trap in 2011. Not only are the new Conibear regulations confusing, but given snowfall accumulations a trap in compliance with the four foot rule from ground to trap on one day may not be the following day. This increases the chance of a lynx getting his/her paw caught in a trap if attracted to the trap as a novel stimuli in the environment or if baited with food or any other type of lure or scent. Furthermore, as reported by the FWS in the DEA, it has

³⁰⁵ DEA at 84; FWS notes that, if trapping pressure were displaced from one area to another, the MDIFW may have to adjust trapping season in other WMDs if they observe significant increase in trapper effort and harvest.

³⁰⁶ ITP application/HCP at 132.

³⁰⁷ ITP application/HCP at 87.

³⁰⁸ ITP application/HCP at 132.

evidence (including videotape footage) of lynx being able to easily access a trap on a 45 degree (or even higher degree) leaning set which renders this rule ineffective in entirely eliminating the potential for the incidental capture of lynx.

The MDIFW's concern about the convenience of trappers who may work or go to school during the week as a justification to not reduce Conibear check times is troubling and disturbing. Considering that a 5-day check time could result in an animal being trapped for an extended period of time in all types of weather, with no ability to gain nourishment, and potentially in an injured state simply because the MDIFW was afraid of inconveniencing trappers must not be given any credence by the FWS in assessing this potential minimization/mitigation measure. It should be noted that, notwithstanding alleged "trapper inconvenience" at present, thirty-six states require a daily or 24-hour trap check time for all traps set on land³⁰⁹ and at least 19 states require 24-hour tending specifically for body-gripping traps set on land.³¹⁰

In particular, considering that one of the potential victims of this extended check time – the lynx – is a federally protected species that the MDIFW is obligated to protect and recover, the FWS must, at a minimum, require the MDIFW to reduce its check time for all traps in all jurisdictions in the state to no more than 24 hours. Not only would this benefit lynx and other wildlife species, but it would also benefit law enforcement officers who then would know that, for all traps anywhere in the state (organized or unorganized area) the trap check time would be the same.

Finally, the claim that MDIFW makes in its ITP application/HCP that no lynx has been caught in a Conibear trap since the new rule was implemented in 2007 cannot be verified given the fact that the actual rate of lynx incidental captures is entirely unknown. Indeed, that statement is no longer even accurate given the 2011 lynx that reportedly was captured and killed in a Conibear trap. It is this incident that likely contributed to the MDIFW promulgating new rule requiring the use of lynx exclusion devices on ground set #220 Conibear sets in some (WMDs 7, 14, 18, and 19) but, inexplicably, not all of lynx occupied range in Maine.

Eliminate 220 Conibear traps entirely (throughout the state) or eliminate the traps in lynx range: The MDIFW discounts this minimization measure by claiming that if the guidelines are followed for setting Conibear traps, lynx will not be captured.³¹¹

Assessment: As indicated above, this argument is no longer valid given the reported killing of a lynx in a Conibear trap in 2011. Given the data demonstrating

³⁰⁹ Fox and Papouchis 2004.

³¹⁰ AFWA 2007.

³¹¹ ITP application/HCP at 131.

that at least five lynx have been captured and killed in Conibear traps since 1999, there is compelling justification to implement such a prohibition to be in compliance with the ESA and to protect lynx from incidental capture and from the pain and suffering if capture, but not immediately killed, in a Conibear trap.

Shortening length of the canid trapping season: If implemented, either by shortening length of season or by eliminating early coyote/fox trapping season, this change might not only reduce the probability of incidental lynx captures by decreasing trapping effort but would also reduce the possibility of serious injury to lynx from frostbite. As conceded by the MDIFW, lynx caught in foothold traps have decreased blood circulation in their feet and consequently are susceptible to frozen digits if caught in a trap when temperatures are below freezing.³¹² According to MDIFW data, in 2006, 45% of the fox and coyotes were caught during the last two weeks in October, 42% were caught in November, and 13% were caught in December. Overall, from 1999 to 2006, 61% of the lynx that were incidentally caught (all trap types) were caught in October, 36% were caught in November, and 3 % were caught in December.³¹³

According to MDIFW, if the early fox/coyote trapping season were eliminated, it would disrupt a large proportion of the candid trapping that occurs in Maine and increase the probability that trappers would trap later into the season to make up for the loss of trapping opportunity.³¹⁴ One danger of pushing trapping effort later into the season is that colder temperatures increase the probably of frozen digits should a lynx be incidentally caught. In addition, lynx incidentally caught in November may have a higher probability of being disturbed in traps than lynx caught in October due to start of Maine's deer season. It also claims that if the canid trapping season were shortened, by half for example, this would upset the trapping community whose members then may be less likely to report incidentally captured lynx.³¹⁵

MDIFW concedes, however, that shortening coyote and fox trapping season in mid-December may be more socially acceptable than an October closure.³¹⁶ Many trappers in northern Maine pull their foothold traps when the ground becomes frozen or covered with snow, consequently there would be relatively little impact on the coyote and fox harvest. However, MDIFW questions the practicality of such a closure in protecting lynx based on the argument that the canid trapping season has been open in December for decades and it has never had a report of a lynx being caught in a foothold trap in December.³¹⁷

³¹² ITP application/HCP at 88 citing Mowat et al. 1994.

³¹³ ITP application/HCP at 88.

³¹⁴ ITP application/HCP at 89.

³¹⁵ ITP application/HCP at 90.

³¹⁶ ITP application/HCP at 89.

³¹⁷ ITP application/HCP at 89.

Assessment: This is a rather circular and convenient argument by the MDIFW. On the one hand, it claims that eliminating the early fox/coyote season (during which historically a large proportion of incidentally trapped lynx were captured) would theoretically result in increased trapping effort in November and December while ending the trapping season early would have not practicable benefit to lynx because so few have historically be reported captured in December. In addition, it claims that any shortening of the canid season by half would be opposed by the trapping community and would jeopardize their cooperation in reporting incidental lynx catches. None of these arguments hold water.

Eliminating the early coyote/fox trapping season would provide considerable benefits to lynx since, statistically, they are more apt to be captured in October than in November or December. This would represent a significant conservation benefit to lynx. While trappers may, in response, increase trapping effort in November and December, it is not known if that effort would remain focused in lynx occupied range or if the trappers could consider going elsewhere to trap (outside of lynx range). An increase in trapping effort in November could mean that more trappers and traps may be on the landscape thereby increasing the potential risk to lynx, but it would also shorten the overall season allowing for increased law enforcement efforts to ensure that trappers are complying with all of the trapping restrictions in place within occupied lynx range. Moreover, the MDIFW has the discretion given its authority over wildlife in the state to impose limits on trapper numbers, traps, or to further limit season length if it determines that the sheer numbers of trappers actively trapping warrant such restrictions to protect wildlife, including lynx.

Shortening the season also would represent a significant conservation benefit to lynx and is warranted as it would, as even the MDIFW concedes, reduce the chances of injury – due to frostbite/exposure – as a result of lynx being caught in December when temperatures in Maine can be well below freezing. The claim that there would be no practicable benefits to lynx is simply preposterous as it is entirely based on reports of incidentally trapped lynx. It is well known, and even conceded by the MDIFW, that reporting rate for trapped lynx, even though it is a requirement, is not complied with by all trappers. Indeed, no one knows what level of compliance there is to this requirement and, thus, there is no accurate data on actual versus reported take. Not only may a shortened season reduce the actual take of lynx but, even if the historical December catch statistics, it will still benefit some lynx without, as the MDIFW admits, significantly impacting trappers.

Finally, the MDIFW's concern about upsetting trappers if such restrictions were enacted which could jeopardize their compliance with the reporting requirements demonstrates that the MDIFW is more interested in placating trappers than protecting lynx as required under the ESA. In regard to the reporting issue, at this

time there is no data on actual compliance so, without some actual accurate baseline data, it is entirely speculative to suggest that any action to protect lynx will affect trapper compliance with the reporting requirement. The only way to obtain said baseline data would be to implement a comprehensive check program whereby trappers are accompanied by MDIFW law enforcement agents or biologists to check trap lines.

Require trappers to use specific traps and/or modify existing traps: MDIFW

considered the possibility of requiring trappers to obtain specific traps (though actual trap type not disclosed). The MDIFW dismissed this option claiming that such a requirement would pose an economic hardship to trappers especially after they have been encouraged to purchase BMP approved traps and that mandating the use of specific traps, including BMP traps, would break a trust between MDIFW and trappers.³¹⁸ MDIFW also indicates that it thinks there is “little that can be done to prevent lynx from being caught in (foothold) traps” and “all traps commonly used by canid trappers can catch and hold lynx.”³¹⁹ Furthermore, it argues that there does not appear to be a ground set for foothold traps that is particularly effective at excluding lynx and, hence, it is not practicable to reduce the amount of lynx take by restricting trap size, type, or by limiting the type of set used to trap canids.³²⁰

In regard to requiring certain modifications to traps to reduce the likelihood of incidentally capturing a lynx, MDIFW asserts that trappers, by their very nature, are constantly modifying their traps to improve performance and to reduce trap related injuries, pull outs, and fur damage. Consequently, trappers, MDIFW believes, should be receptive to modification recommended through an information and education strategy without the need to resort to additional regulation³²¹ to force such changes and that, such a regulatory approach could diminish long-term trapper cooperation with MDIFW.³²² Furthermore, MDIFW argues that a regulation requiring trap modifications (i.e., additional swivels, chain length) would be difficult to enforce since such components are commonly buried underground and, therefore, would not be visible to game wardens.³²³

³¹⁸ ITP application/HCP at 98/99. As explained in a footnote in the ITP application/HCP, Maine trappers were told at the initiation of a BMP trap testing process that MDIFW’s intention was only to use the results to make recommendation to trappers about traps to purchase but not to use the results as a regulatory tool. Consequently, MDIFW is concerned that to now promulgate a regulation to require specific traps to be used in lynx occupied habitat, would be inconsistent with its previous assurances to the trappers.

³¹⁹ ITP application/HCP at 91.

³²⁰ ITP application/HCP at 92.

³²¹ See ITP application/HCP at 75,76, based on additional information in the ITP application/HCP, it is clear that, in general, the MDIFW prefers the dialog and information exchange as a means of solving problems instead of a regulatory approach. It believes that the former strategy is more effective in gaining compliance, promoting the sense of cooperation, and generating trust between the agency and user.

³²² ITP application/HCP at 98, 99, 133.

³²³ ITP application/HCP at 133.

Assessment: BMP approved traps have not been proven to be effective at minimizing the incidental take of lynx or in preventing injuries to lynx. If foothold trapping is allowed at all in lynx occupied range, at a minimum, the FWS and MDIFW should require that trappers only use #1.5 traps or smaller, padded with off-set jaws, with short chains (8 inches or less), at least three swivels, staked (no drags), and with pan tension device set appropriately to minimize the potential of trapping lynx. If trappers are capable of modifying existing traps to meet these standards they should be required to do so or to purchase traps to replace non-compliant trap types. The cost or any hardship to the trapper should be of no concern given that the FWS and MDIFW are obligated, by law, to do everything in their power to protect and recover lynx. If the cost or hardship of replacing traps causes trappers to forego trapping or, more likely, trap where such restrictions are not in place, this is a consequence of the need to protect the lynx. Furthermore, difficulty of enforcement is not a relevant concern since game wardens can check traps before being set, after being pulled, or they could direct trappers to remove the trap from the set for inspection.

Modify existing coyote and fox trapping regulations: MDIFW considered whether the current level of lynx incidental take justified modifying Maine's canid trapper regulations to reduce said take, trapping injuries, or mortalities. Instead of seriously considering this option, the MDIFW claimed that existing amount of incidental take and injuries associated with trapping "do not appear to be having a significant biological impact on Maine's lynx population."³²⁴ Consequently, additional trapping restrictions for canid trappers are neither necessary nor practicable. The MDIFW does concede that if trapping efforts for coyotes increase or if there were some other compelling reason to reduce trapping effort within lynx range, it may revisit these options.³²⁵

Assessment: The existing amount of incidental takes and injuries is based on reporting data that unlikely to provide a true assessment of actual take and the real rate of injuries. Moreover, the deterministic model used by the MDIFW – the model that presumably it would use to substantiate its claim of incidental trapping not have a significant biological impact on Maine's lynx population – is of highly dubious value given the high density lynx parameters used in the model. Such models are only as good as the data used to run them and, frankly, in this case the model is deficient. Moreover, considering the modeling results presented by Dr. Paul Paquet in *Animal Welfare Institute v. Roland Martin* – a model that demonstrates the lynx population declining to extinction by year 50 even with the periodic immigration of lynx from outside population, the MDIFW model must be

³²⁴ ITP application/HCP at 130.

³²⁵ ITP application/HCP at 130.

even more closely examined for legitimacy, or lack thereof. Even the “back-of-the-envelope” calculation using the MDIFW’s own data indicates that the incidental take of lynx from this population in concert with other stressors impacting the population is, in fact, having a significant biological impact on the population. Finally, at present the MDIFW is permitting and, in fact, authorizing the incidental take of lynx in violation of the ESA. Thus, when MDIFW’s own data prove that the majority of incidentally captured lynx are caught in traps set for canids, it is inexcusable that additional changes to the canid trapping regulations haven’t already been implemented to reduce the possibility of incidental take.

Not only are stricter trapping regulations clearly a potential minimization measure that the MDIFW has not fully implemented but, if it were to do so or if the FWS mandates it to do so, it must also ramp up its wildlife law enforcement efforts. At present, not only are there too few wardens to adequately patrol the entire state but penalties for those who violate wildlife laws are, as is the case throughout the country and worldwide, far too lenient. Indeed, according to the FWS “unlawful activities, such as the illegal killing of wildlife, are thought to be worthy of stiff fines and possible jail sentences by 87% of the public surveyed” and trappers interviewed by the FWS as it prepared the DEA stiff, mandatory penalties for failure to report the incidental take of a lynx to ensure that take was being quantified accurately.”³²⁶

Prohibiting the use of drags: MDIFW defends drags as providing animals with the ability to conceal themselves to avoid disturbance by humans and other animals so as to avoid injury. Though it does not discount the risk of injury if an animal is caught in a trap with a drag, it claims that risk is outweighed by the risk of injury if disturbed by people.³²⁷

MDIFW also claims that based on the incidental trapping data collected from 1999 through 2007 where the method of trap anchoring was known, 20 (63%) of the traps were set with a drag and 12 (38%) were staked. The injury rates for those lynx for which MDIFW officials assisted with the release were 3 out of the 7 for lynx caught in staked traps who did not have any visible signs of injury as compared to 3 out of 8 for lynx caught in traps with drags.³²⁸ For the 8 lynx caught in a trap with a drag that were inspected by MDIFW officials, one (13%) suffered a serious injury which, according to the MDIFW, is similar to the serious injury rate for coyotes trapped in BMP traps (staked) but higher than the serious injury rate for bobcats.³²⁹

³²⁶ DEA at 41, 41 citing Kellert 1979, S. Loch, Minnesota, pers. comm., November 2009 and C. Niemeyer, Idaho, pers.comm., November 2009.

³²⁷ ITP application/HCP at 97,98.

³²⁸ ITP application/HCP at 96/97.

³²⁹ ITP application/HCP at 97.

Based on its belief that trapped animals are better off if they can conceal themselves to avoid interactions with people and other animals and because very few lynx experienced serious injuries in traps with drags, and since the rate of no or mild injury was similar in staked traps versus traps with drags, it was not practicable or necessary to prohibit the use of drags. Furthermore, promulgating such a regulation would impose a hardship on trappers who commonly use drags in sets along roads to decrease the chance that people traveling the road will disturb or steal the trapped animals or his/her traps.³³⁰ In addition, the use of drags permit trappers to check their trap lines from their vehicles.

Assessment: It is troubling that the MDIFW would oppose a prohibition on the use of drags on traps considering that in its own trapping information materials it advocates that foothold traps be staked to avoid animal – including incidentally caught lynx – entanglement with debris that could result in – as has occurred – serious injury to the trapped lynx. Since the MDIFW recommends the use of stakes to anchor foothold traps, the FWS should mandate such a measure that, while not likely to reduce the likelihood of a lynx being incidentally trapped, should reduce the potential for serious injury. The FWS should ignore MDIFW claims that suggest that drags are necessary and those statements that prohibiting drags would pose any hardship on trappers.³³¹

Furthermore, based on a review of the 1999-2007 incidental trapping statistics, there were only 13 foothold trap sets in total that were either staked or set up with a drag at which MDIFW assisted with the release of lynx. Of these, 6 of the traps were staked and lynx captured in these traps experienced either mild (4) or no (2) injuries. For lynx captured in traps with drags, the documented injuries included unknown (1), none (2), mild (3), and serious (1). While these injury rates may be similar, they do not reflect actual injury rates for those incidentally caught lynx that are never reported to the MDIFW. Furthermore, the mere fact that even one lynx experienced a serious injury (surely an underestimate if the actual injury rate of all trapped lynx was known) as a result of being captured in a trap with a drag is unacceptable particularly since this risk can be minimized by, as even the MDIFW recommends, setting foothold traps with stakes.

(iii) the applicant will ensure that adequate funding for the plan will be provided;

As indicated above, the MDIFW has provided evidence to suggest that the funding for the implementation of the ITP over as many as 15 years may not be consistently available. The MDIFW's development of alternative means of implementing ITP requirements if funding

³³⁰ ITP application/HCP at 98.

³³¹ It should be noted that drag sets were prohibited for use in Minnesota to protect lynx from entanglement and self-strangulation. See *Animal Protection Institute et al. v. Holsten*, Civ 06-cv-03776-MJD-RLE (D. Minn. March 31, 2008).

is short or eliminated, is effectively a concession that it cannot promise that full funding of the ITP (if granted) would be available for the duration of the permit.

(iv) the taking will not appreciably reduce the likelihood of the survival and recovery of the species in the wild; and

Considering the inadequacies in the deterministic model employed by the MDIFW in this case, its own evidence of significant changes in lynx demographic characteristics when snowshoe hare densities are low, the fact that lynx are more vulnerable to being captured in a trap when populations are diminished, and the predictions of reduced habitat quantity and quality as regenerating forests mature, it is impossible to claim, as the MDIFW, that its take won't appreciably reduce the survival and recover of lynx in Maine. Furthermore, considering the anticipated adverse environmental changes, particularly as a result of climate change, that is impacting and will continue to impact lynx, snowshoe hares, and their habitat, there is even more compelling evidence to recognize that this criteria simply can't be met.

Of particular concern is that the monitoring of incidental take and of lynx populations provided for is inadequate to assess whether taking will appreciably reduce the survival and recovery of these species. ESA Section 10 regulations require that an application specify the measures the applicant will take to monitor the impacts of the taking resulting from project actions.³³² Monitoring methods should be specific, commensurate with the project scope and provide the information necessary to assess compliance and project impacts. At minimum, three types of monitoring are essential: a) monitoring of incidental take; b) monitoring of mitigation measures to determine if they are producing required results; and c) monitoring of species' status in the project area to assure the level of take does not rise to the level of jeopardy.

The MDIFW provides no information to document that it has the means to engage in the level of monitoring required under the ESA. It hasn't identified a mechanism to accurately determine trapper compliance with the mandatory reporting requirement for lynx and, hence, to assess actual take. Nor, has it provided a clear blueprint for how it would monitor the effectiveness of the proposed mitigation area (if created) or to assess the benefit provided by other actions it has, albeit reluctantly, implemented over the years to try to reduce the incidental take of lynx. Finally, without an accurate lynx population estimate and without an adequate tool to reliably monitor the population to detect positive or negative trends, it is unclear how the MDIFW can comply with the no jeopardy mandate of the ESA.

[

³³² 50 C.F.R. § 17.22, 17.32, and 222.307.

(v) the measures, if any, required under subparagraph (A)(iv) will be met; and he has received such other assurances as he may require that the plan will be implemented.

Considering that the MDIFW has not remedied all of the deficiencies identified by the FWS in previous versions of the ITP application/HCP, it is not clear if the MDIFW can be trusted to embrace and meet any measures imposed by the FWS if it elects to issue the ITP. The MDIFW could remedy this potential lack of trust if it were to repeal the current ITP application/HCP and submit a new application that address all past and present deficiencies identified by the by the FWS in previous correspondence with the MDIFW or in the DEA.

Specific questions included in the DEA:

In regard to the questions posed by the FWS in the DEA, the foregoing information addresses each of the questions. However, to summarize, the following specific responses are provided:

- Did we review and appropriate list of feasible or practicable alternatives and conservation measures?

Yes and No. Though Alternative C and D include consideration of a variety of measures that would improve the situation in regard to likely reducing the number of lynx incidentally trapped and, therefore, improving compliance with the ESA, there were certain measures (i.e., prohibition on all Conibear trap use in lynx range, mandatory trapper education courses including refresher courses for all resident and non-resident trappers, reduction in the number of snowshoe hares killed by hunters in lynx occupied habitat, use of specific traps that have not reportedly resulted in significant injury to lynx if set properly) that could have been considered. Among the alternatives considered, while it is understood why the FWS crated the five alternatives evaluated in the DEA, a sixth alternative combining the most restrictive of all conservation measures would be, with the exception of a prohibition of all upland, dryland trapping in lynx occupied range (Alternative E), preferred.

- Is there additional information that would help assess the effectiveness of the conservation measure proposed under the 4 alternatives?

Yes. The FWS identified significant deficiencies in the MDIFW ITP application/HCP and articulated why the inclusion of the missing information would have provided a more solid foundation from which to engage in the analysis required by NEPA. Examples of this missing data or analysis in the MDIFW ITP application/HCP and, subsequently, from the DEA are incorporated into this comment letter as bulleted lists.

- Are there additional feasible or practicable conservation measures that we should consider?

Yes. See response to question 1 above and additional information on this subject addressed in this comment letter.

- Is there additional information that could better inform this environmental assessment?

Yes. See response to question 2 above.

- Have we appropriately anticipated the direct, indirect, and cumulative environmental effects of the various alternatives?

Yes and No. In its analysis of many of the individual environmental consequence categories the FWS provided relevant analysis of the direct, indirect, and cumulative impacts. However, as the FWS concedes, there is significant and critical information missing from the MDIFW ITP application/HCP which, at no fault of its own, largely hamstrung the FWS from preparing a complete DEA and fully evaluating the range of impacts of each alternative. The FWS attempted to provide some updated information given that the MDIFW ITP application/HCP was over three years old, but it simply was unable to provide all of the information needed to prepare a comprehensive analysis; that burden falls squarely on the MDIFW.

The FWS did fail to address the impact of recreation, particularly winter recreation on lynx and lynx habitat and its assessment of climate change impacts was lacking in commitment to consider the long-term implications of climate change and its impact on lynx in the context of immediate lynx management actions and decisions. The claim that climate change impacts will not be relevant to the lynx during the duration of the ITP, even if accurate, only serves to pass the buck to a future generation to ensure that long-term climate change impacts are being mitigated for now through management actions. This is inconsistent with the precautionary principle which is clearly triggered here given the definite and, in some cases, uncertain impacts that climate change will have on lynx, lynx ecology, habitat, and its primary prey species. Finally, though the FWS provided valuable information in its cumulative impacts analysis about past, present and reasonable foreseeable future actions that may impact lynx and lynx habitat in Maine, there was little attempt to try to, for example, model such present and future actions to predict how they may impact lynx both immediately and in the future.

Additional Concerns:

Considering that the ITP application/HCP has been requested to be applicable statewide, it is important to note that the requested ITP, if issued, will not address all issues related to trapping and federally protected species in Maine. As previously indicated, the use of

snare in lynx occupied habitat, which was prohibited by the 2007 Consent Decree, will require a separate ITP application/HCP if the MDIFW wants to potentially reauthorize the use of snare in lynx habitat; an action that AWI and PC would strongly oppose. Furthermore, though only briefly mentioned in either the DEA or ITP application/HCP, there is increasing evidence that gray wolves are returning to Maine. The DEA suggests that this may be taking place but did not consider more recent evidence documenting the presence of wild wolves (not captive and escaped or intentionally released wolves) in Maine. The most obvious evidence is the illegal killing of a gray wolf by two hunters north of Moosehead Lake on August 30, 1993.³³³ Other confirmed kills or sightings have also been documented.

Even the MDIFW recognizes the possibility of wolves inhabiting Maine. In a June 25, 2008 email communication from Walter Jakubas to Ken Elowe, Mr. Jakubas reports that “Debbie and others have been concerned that wolves immigrating into the state are being killed and not reported.” Mr. Jakubas then writes that “the only time we hear about a large canid being killed by a trapper is well after the fact, when the carcass has been disposed of.” While this may not be conclusive evidence of wolves in Maine, it does raise the possibility.

More recently, evidence was published of the existence of three wild wolves in the northeastern United States based on analysis of bone and hair samples using carbon isotope testing. The results of this tested led to a determination that, of a total of eight wolves sampled, three were clearly wild wolves.³³⁴ While the samples of these wolves were reportedly obtained from New York and Vermont, this information adds a new compelling piece to the increasingly likely prospect that wild wolves may be dispersing into Maine.

If it is determined that wolves are present in Maine it will be crucial that the MDIFW and FWS act urgently to protect these animals by taking concrete and expeditious action to prevent, minimize, or, preferably, eliminated the potential for the incidental trapping or intentional or unintentional shooting/hunting of the pioneering animals.

Conclusion:

There can be little question that the ITP application/HCP submitted by MDIFW is inadequate and incomplete as has been exhaustively addressed in this letter. Moreover, even the FWS identifies significant deficiencies in the ITP application/HCP in its own DEA. Consequently, the FWS has little choice but to terminate this decision-making process, direct MDIFW to prepare a complete ITP application/HCP, and then either supplement the DEA or, as is clearly mandated in this case given the provision of NEPA,

³³³ Canada Telegraph Journal, ‘Wolves are likely about to return to N.B.’ January 4, 2012.

³³⁴ Kays and Feranec 2011.

prepare an EIS to comprehensively evaluate the environmental impacts of the proposed issuance of the requested ITP. If the FWS were to select this option at this time, it must also advise the MDIFW that any future incidental takes of lynx in Maine violate the ESA, that the FWS will consider prosecuting the offenders (including the MDIFW for permitting trapping in lynx occupied range), and that, therefore, the MDIFW should implement further restrictions on trapping in lynx habitat or terminate the practice altogether pending the issuance of an ITP.

Alternatively, if the FWS is considering issuing an ITP despite the inherent deficiencies in the ITP application/HCP, the FWS should contemplate issuing an interim ITP, valid for no more than three years, including a series of mandatory and strict conservation measures intended to eliminate, to the extent possible, the incidental capture of lynx. In doing so, the FWS should still direct the MDIFW to prepare a new and improved ITP application/HCP which the FWS should agree needs to be evaluated in the context of an EIS. The two options most closely comply with the requirements of the ESA and, therefore, should be seriously considered by the FWS.

While difficult to summarize a document of this length and detail, the bottom line is that the MDIFW has failed to meet its legal mandate under the ESA to obtain the requested ITP. It's analysis of the impact of the incidental take of lynx to the viability of the population through its deterministic model is significantly flawed and fails to consider demographic parameters when lynx populations (and snowshoe hare populations) are declining or surviving at a low density. It also has ignored its mandate to protect and recover lynx by failing to implement the wealth of minimization measures that it has available to reduce or eliminate the incidental take of lynx claiming, in many cases, that the changes are not practicable, justified, or that they would be inconvenient or impose hardships on trappers. In addition, the ITP application/HCP is three years old and clearly does not incorporate the best available scientific evidence as required by the ESA.

While the FWS has attempted to fill some of the gaps in the ITP application/HCP by incorporating more recent data into the DEA, the DEA remains woefully inadequate and clearly not compliant with NEPA. Not only is the evaluation of environmental consequences incomplete and, in places, weak but the FWS failed to even consider the impacts of winter recreation on lynx and lynx habitat in its cumulative impact analysis. Admittedly, the deficiencies in the DEA are, in part due to the inadequacies inherent to the ITP application/HCP, but the MDIFW's failings to not obviate the responsibility of the FWS to comply with NEPA.

AWI and PC appreciate the opportunity to submit this comment letter and to participate in this decision-making process. Should you have any questions, please contact D.J. Schubert at dj@awionline.org or, via telephone, at 1-609-601-2875. In addition, if there is any

future correspondence on this matter, please send to Mr. Schubert electronically or, by mail, to 202 Cranberry Court, Egg Harbor Township, NJ 08234.

Sincerely,



D.J. Schubert
Wildlife Biologist
Animal Welfare Institute



Camilla Fox
Executive Director, Project Coyote
Wildlife Consultant, Animal Welfare Institute

References Cited:

American Veterinary Medical Association (AVMA). 2008. Leghold trap use in conservation and research.

http://www.avma.org/issues/animal_welfare/leghold_traps_bgnd.asp.

Arnemo, J.M., P. Ahlqvist, R. Anderson, F. Berntsen, G.Ericsson, J. Odden, S. Brunberg, P. Segerstrom, and J.E. Swenson. 2006. Risk of capture-related mortality in large free-ranging mammals; experiences from Scandinavia. *Wildlife Biology*. 12(1): 109-113.

Association of Fish and Wildlife Agencies (AFWA). 2007. Summary of trapping regulations for fur harvesting in the United States.

Aubry, K.B., G.M. Koehler, J.R. Squires. 2000. Ecology of Canada lynx in southern boreal forests. In Ruggiero, L.F., K.B Aubry, S.W. Buskirk, et al., tech. eds. The scientific basis for lynx conservation in the contiguous United States. Gen. Tech. Rpt. RMRS-GTR-30. Ogden, UT: U.S. Dept. Agriculture, Forest Service, Rocky Mountain Research Station.

Bailey, T.N., E.E. Bangs, M.F. Portner, J.C. Malloy, and R. McAvninch. 1986. An apparently overexploited lynx population on the Kenai Peninsula, Alaska. *Journal of Wildlife Management*. 50:279-290.

Banci, V and G. Proulx. 1999. Resiliency of Furbearers to Trapping in Canada. Pages 1 – 46 in Proulx G, ed. Mammal Trapping. Sherwood Park Alberta: Alpha Wildlife Research and Management Ltd..

Barrett, M.W., G. Proulx, D. Hobson, D. Nelson, and J.W. Nolan. 1989. Field evaluation of the C120 Magnum trap for marten. *Wildlife Society Bulletin*. 17:299-306.

Berchielli, L.T. and B.F. Tullar. 1980. Comparison of a leg snare with a standard leg-gripping trap. *New York Fish and Game Journal*. 27:63-71.

Bider, J. R. 1962. Dynamics and the temporal-spatial relations of a vertebrate community. *Ecology* 43:634-646.

Brand, C.J., and L.B. Keith. 1979. Lynx demography during a snowshoe hare decline in Alberta. *Journal of Wildlife Management*. 43:827-849.

Bunnell, K.D., J.T. Flinders, and M. L. Wolfe. 2006. Potential Impacts of Coyotes and Snowmobiles on Lynx Conservation in the Intermountain West. *Wildlife Society Bulletin*. 34(3):828-838.

Burnham, K.P., and D.R. Anderson. 1984. The need for distance data in transect counts. *Journal of Wildlife Management*. 48:1248-1254.

Buskirk, S.W., L.F. Ruggiero, C.J. Krebs. 2000. Habitat fragmentation and interspecific competition: implications for lynx conservation. Pp. 83-100 in L.F. Ruggiero, K.B. Aubry, S.W. Buskirk, G.M. Koehler, C.J. Krebs, K.S. McKelvey, J.R. Squires, (editors). *Ecology and Conservation of Lynx in the United States*. University Press of Colorado, Boulder, Colorado, USA.

Carroll, C. 2007. Interacting effects of climate change, landscape conversion, and harvest on carnivore populations at the range margin: marten and lynx in the northern Appalachians. *Conservation Biology* 21:00-00 (Published online June 6, 2007 at <http://www.blackwell-synergy.com>).

Carroll, C. 2005. Carnivore Restoration in the Northeastern U.S. and Southeastern Canada: A Regional-Scale Analysis of Habitat and Population Viability for Wolf, Lynx, and Marten. (Report 2: Lynx and Marten Viability Analysis). *Wildlands Project Special Paper No. 6*. Richmond, VT: Wildlands Project. 46 pp.

Cattet, M., J. Boulangier, G. Stenhouse, R.A. Powell, and M.J. Reynolds-Hogland. 2008. An evaluation of long-term capture effects in ursids: implications for wildlife welfare and research. *Journal of Mammalogy*. 89:973-990.

Chapman, J., G. Willner, and K. Dixon. 1978. Differential survival rates among leg-trapped and live-trapped nutria. *Journal of Wildlife Management*. 5(2):147-160.

Cross, M.L., E. Swale, G. Young and C. Mackintosh. 1999. Effects of field capture on the measurement of cellular immune responses in wild ferrets (*Mustela furo*), vectors of bovine tuberculosis in New Zealand. *Veterinary Research*. 30:401-410.

Danby, R.K. and D.S. Hik. 2007. Variability, contingency, and rapid change in recent subarctic alpine tree line dynamics. *Journal of Ecology*. 95:352-363.

Elton, C., and M. Nicholson. 1942. The 10-year cycle in numbers of the lynx in Canada. *J. Anim. Ecol.* 11:215-244.

Englund, J. 1982. A comparison of injuries to leg-hold trapped and foot-snared red foxes. *Journal of Wildlife Management* 46:1113-1117

Fox, C.H., and C.M. Papouchis (eds.). 2004. *Cull of the Wild: A Contemporary Analysis of Wildlife Trapping in the United States*. Sacramento CA: Animal Protection Institute.

Fox, C.H. 2004a. The Development of International Trapping Standards. Chapter 4 in Fox, C.H., and C.M. Papouchis, eds. *Cull of the Wild: A Contemporary Analysis of Wildlife Trapping in the United States*. Sacramento: Animal Protection Institute.

Fox, C.H. 2004b. Wildlife Trapping, Behavior, and Welfare. In M. Bekoff (editor). *Encyclopedia of Animal Behavior*. Westport, Connecticut: Greenwood Publishing Group.

Fuller, A.K. 1999. Influence of partial harvesting on American marten and their primary prey in northcentral Maine. M.S. thesis, University of Maine, Orono, Maine. 141pp.

Gilbert FF. 1981. Maximizing the humane potential of traps – the Vital and the Conibear 120. Pages 1,630-1,646 in Chapman JA and D Pursley eds. *Proceedings of the Worldwide Furbearer Conference*, University of Maryland, Frostburg.

Gonzalez, P., R.P. Neilson, K.S. McKelvey, J.M. Lenihan, and R.J. Drapek. 2007. Potential impacts of climate change on habitat and conservation priority areas for *Lynx canadensis* (Canada lynx). Report to the Forest Service, U.S. Department of Agriculture, Washington D.C., and NatureServe, Arlington, VA. 19 pages.

Hagan, J.M., L.C. Irland, and A.A. Whitman. 2005. Changing timberland ownership in the northern forest and implications for biodiversity. Manomet Center for Conservation Sciences, Report #MCCS-FPC-2005-1, Brunswick, Maine, 25pp.

Hartup, B.K., G.V. Kollias, M.C. Jacobsen, and K.R. Kimber. 1999. Exertional myopathy in translocated river otters in New York. *Journal of Wildlife Diseases*. 35: 542-547

Hodges, K.E. 2000. Ecology of snowshoe hares in southern boreal and montane forests. Pages 163-206 in L.F. Ruggiero, K.B. Aubry, S.W. Buskirk, et al. *Ecology and conservation of lynx in the contiguous United States*. University Press of Colorado, Boulder.

Homyack, J.A., J.H. Vashon, C. Libby, E.L. Lindquist, S. Loch, K.L. Pilgrim, and M.K. Schwartz. 2008. Canada lynx-bobcat (*Lynx canadensis* / *L. rufus*) hybrids at the southern periphery of lynx range in Maine, Minnesota and New Brunswick. *American Midland Naturalist*. 159:504-508.

Hornocker, M.G., and H.S. Hash. 1981. Ecology of the wolverine in northwestern Montana. *Canadian Journal of Zoology*. 59:1286-1301.

Hoving, C. L. 2001. *Historical Occurrence and Habitat Ecology of Canada Lynx (Lynx Canadensis) in Eastern North America*. Orono, The University of Maine. Masters: 2001.

Hoving, C.L., D.J. Harrison, W.B. Krohn, W. B. Jakubas and M. A. McCollough. 2004. Canada lynx (*Lynx canadensis*) habitat and forest succession in northern Maine, USA. *Wildlife Biology* 10:285-294.

Hoving, C.L., D.J. Harrison, W.B. Krohn, R.A. Joseph, and M. O'Brien. 2005. Broad scale predictors of Canada lynx occurrence in eastern North America. *Journal of Wildlife Management* 69:739-751.

Hubert, G.F., L.L. Hungerford, and R.D. Bluett. 1997. Injuries to coyotes captured in modified foothold traps. *Wildlife Society Bulletin*. 25:858-863.

Iossa, G., Soulsbury, C.D., Harris, S. 2007. Mammal trapping: a review of animal welfare standards of killing and restraining traps. *Animal Welfare* 16:335-352.

Jacobsen, G.L., I.J. Fernandez, P.A. Mayewski, and C.V. Schmidt (editors). 2009. *Maine's climate future: an initial assessment*. Orono, Maine: University of Maine.

Jakubas, W.J. and R. Cross. 2001. Snowshoe hare (*Lepus americanus*) assessment. Unpublished report, Maine Department of Inland Fisheries and Wildlife, Bangor, Maine. 60pp.

Kays, R. and R.S. Feranec. 2011. Using Stable Carbon Isotopes to Distinguish Wild from Captive Wolves. *Northeastern Naturalist*. 18(3):253-264.

Kellert, S.H. 1979. Public attitudes toward critical wildlife and natural habitat issues. Phase I. U.S. Department of the Interior, Fish and Wildlife Service. Washington, DC. 138pp.

Kern, J. W., L. L. McDonald, D. D. Strickland, and E. Williams. 1994. Field evaluation and comparison of four foothold traps for terrestrial furbearers in Wyoming. *Western EcoSystems Technology*, Cheyenne, Wyoming.

Knick, S.T. 1990. Ecology of bobcats relative to exploitation and a prey decline in southeastern Idaho. *Wildlife Monographs*. 108. 42 pp.

Knowles, N., M.D. Dettinger, and D.R. Cayan. 2006. Trends in snowfall versus rainfall in the western United States. *Journal of Climate*. 19:4545-4559.

Krebs, C.J., R. Boonstra, S. Boutin and A.R.E. Sinclair. 2001. What Drives the 10-year Cycle of Snowshoe Hares? *BioScience* 51:25-35.

Kreeger, T.J., P.J. White. U. Seal, and J.R. Tester. 1990. Pathological responses of red fox to foot hold traps. *Journal of Wildlife Management* 54:147-160.

Kolbe, J. A., J. R. Squires, and T. W. Parker. 2003. An effective box trap for capturing lynx. *Wildlife Society Bulletin* 31:980-985.

Kolbe, J.A., J.R. Squires, D.H. Pletscher, and L.F. Ruggiero. 2007. The Effect of Snowmobile Trails on Coyote Movements Within Lynx Home Ranges. 71(5):1409-1418.

Kuehn, D.W., T.K. Fuller, L.D. Mech, W.J. Paul, S.H. Fritts, and W.E. Berg. 1986. Trap-related injuries to gray wolves in Minnesota. *Journal of Wildlife Management*. 50:90-91.

Lachowski, H.J. 1997. Relationships among prey abundance, habitat and American marten in Northern Maine. M.S. Thesis, University of Maine, Orono, Maine, USA. 43pp.

Little, S.E., W.R. Davidson, E.W. Howerth, P.M. Rakich, and V.F. Nettles. 1998. Diseases diagnosed in red foxes from the southeastern United States. *Journal of Wildlife Diseases*. 34(3): 620-624.

Litvaitis, J.A. 1984. Bobcat movements in relation to prey density. Doctoral Dissertation, University of Maine, Orono.

Litvaitis, J.A., M. O'Donoghue, M. Miller, and J.A. Sherburne. 1983. An evaluation of trapping efforts to capture bobcats, coyotes, and red fox. Proceedings of the Eastern Wildlife Damage Control Conference. 1:125-127.

Litvaitis, J.A., J.A. Sherburne, and J.A. Bissonette. 1985. Influence of understory characteristics on snowshoe hare habitat use and density. Journal of Wildlife Management. 49:866-873.

Litvaitis, J. A. 1992. Niche relations between coyotes and sympatric Carnivora. Pages 73-85 *In* A. H. Boer, ed. Ecology and management of the eastern coyote. University of New Brunswick Wildlife Research Unit, Fredericton, NB.

MacPherson, A.H. 1969. The dynamics of Canadian arctic fox populations. Canadian Wildlife Service Report Series -8. 8 pp.

Maine Department of Inland Fisheries and Wildlife (MDIFW). 2003. Canada Lynx (*Lynx canadensis*). Maine's Endangered and Threatened Wildlife. MDIFW Endangered Species Program.

Maine Department of Inland Fisheries and Wildlife (MDIFW) 2005. Maine's Comprehensive Wildlife Conservation Strategy. September 2005. Available from: <http://www.maine.gov/ifw/wildlife/compwildlifestrategy/pdfs/chapter5.pdf> (accessed June 8, 2007).

Maine Department of Inland Fisheries and Wildlife (MDIFW) 2007a. Draft Incidental Take Plan for Maine's Trapping Program. Maine Department of Inland Fisheries and Wildlife, August, Maine. Dated May 15, 2007.

Maine Department of Inland Fisheries and Wildlife (MDIFW) 2007b. Draft Incidental Take Plan for Maine's Trapping Program. Maine Department of Inland Fisheries and Wildlife, August, Maine. Dated June 29, 2007.

Maine Department of Inland Fisheries and Wildlife (MDIFW) 2008. Hunting and Trapping Regulations. Maine Department of Inland Fisheries and Wildlife. Available online at: http://maine.gov/fws/laws_rules/pdf/huntinglaws.pdf. (accessed September 9, 2008).

Maine Department of Inland Fisheries and Wildlife (MDIFW). Draft Incidental Take Plan for Maine's Trapping Program. Maine Department of Inland Fisheries and Wildlife, August, Maine. Dated August 13, 2008.

Maine Department of Inland Fisheries and Wildlife (MDIFW). May 23, 2008. Incidental Take Plan for Maine's Trapping Program.

Maine Department of Inland Fisheries and Wildlife (MDIFW). 2011. 2011 Trapping Regulations & Recommendations to Avoid Lynx Capture.

Maine Department of Inland Fisheries and Wildlife (MDIFW). 2011. The Official 2011-2012 State of Maine Hunting and Trapping Laws and Rules.

McCord, C.M., and J.E. Cardoza. 1982. Bobcat and lynx in J.A. Chapman and G.A. Feldhamer (eds.). Wild mammals of North America biology, management and economics. Johns Hopkins University Press, Baltimore, MD

McCullough, M.A. 2007. Canada lynx habitat management guidelines for Maine. Unpublished document. Maine Field Office, U.S. Fish and Wildlife Service, Orono, Maine.

Moen, R., G. Niemi, C.L. Burdett, and L.D. Mech. 2004. Canada lynx in the Great Lakes region, 2004 annual report to USDA Forest Service and MN Cooperative Fish and Wildlife Unit. NRRRI Technical Report No. NRRRI/TR-2004-33.

Moen, R., G. Niemi, C.L. Burdett, and L.D. Mech. 2005. Canada lynx in the Great Lakes region. 2005 annual report to USDA Forest Service, MN Cooperative Fish and Wildlife Unit, and Minnesota Department of Natural Resources. NRRRI Technical Report No. NRRRI/TR-2006-16.

Monthey, R.W. 1986. Responses of snowshoe hares, *Lepus americanus*, to timber harvesting in northern Maine. Canadian Field-Naturalist. 100:568-570.

Mowat, G., G.B. Slough, and R. Rivard. 1994. A comparison of three live capturing devices for lynx: capture efficiency and injuries. Wildlife Society Bulletin 22:644-650.

Mowat, G., K.G. Poole, and M. O'Donoghue. 2000. Ecology of lynx in northern Canada and Alaska. Pages 265-306 in L.F. Ruggiero, K.B. Aubry, S.W. Buskirk, et al. Ecology and conservation of lynx in the contiguous United States. University Press of Colorado, Boulder.

Murray, D. L. and S. Boutin. 1991. The influence of snow on lynx and coyote movements: does morphology affect behavior? Oecologia. 88:463-469.

Murray, D. L., S. Boutin, M. O'Donoghue, and V. O. Nams. 1995. Hunting behavior of sympatric felid and canid in relation to vegetative cover. Animal Behavior 50:1203-1210.

Murray, D.L., T.D. Steury and J.D. Roth. 2008. Assessment of Canada Lynx Research and Conservation Needs in the Southern Range: Another Kick at the Cat. *Journal of Wildlife Management* 72:1463–1472.

Nelson, C., and D. Verbyla. 1984. Characteristics and Effectiveness of State Anti-Poaching Campaigns. *Wildlife Society Bulletin*. 12(2):117-122.

Nocturnal Wildlife Research. 2008. Welfare outcomes of leg-hold trap use in Victoria. Nocturnal Wildlife Research, Malvern, Victoria, Australia.

Novak, M. 1987. Traps and trap research. Pages 941-969 in M. Novak, J. A. Baker, M. E. Obbard, and B. Malloch, editors. *Wild furbearer management and conservation in North America*. Ontario Trappers Association, North Bay, Ontario, Canada.

Naylor, B. J. and M. Novak. 1994. Catch efficiency and selectivity of various traps and sets used for capturing American martens. *Wildlife Society Bulletin* 22:489-496.

O'Donoghue, M., S. Boutin, C. J. Krebs, G. Zuleta, D. L. Murray, and E. J. Hofer. 1998. Functional responses of coyotes and lynx to the snowshoe hare cycle. *Ecology* 79(4):1193-1208.

Onderka, D.K., D.L. Skinner, and A.W. Todd. 1990. Injuries to coyotes and other species caused by 4 models of footholding devices. *Wildlife Society Bulletin*. 18:303-307.

Ozoga, J. J. and E. M. Harger. 1966. Winter activities and feeding habits of northern Michigan coyotes. *J. Wildl. Manage.* 30 (4):809-818.

Papouchis, C.M. 2004. Trapping: A Review of the Scientific Literature. Chapter 6 in Fox, CH, and CM Papouchis, ed. *Cull of the Wild: A Contemporary Analysis of Wildlife Trapping in the United States*. Sacramento: Animal Protection Institute.

Patterson, B.D., E.J. Neiburger, and S.M. Kasiki. 2003. Tooth breakage and dental disease as causes of carnivore-human conflicts. *Journal of Mammology* 84:190-196.

Powell, R.A. and G. Proulx. 2003. Trapping and marking terrestrial mammals for research: Integrating ethics, performance criteria, techniques, and common sense. *ILAR Journal* 44:259-276.

Proulx G. 1999. Review of current mammal trap technology in North America. In: Proulx G, ed. *Mammal Trapping*. Sherwood Park Alberta: Alpha Wildlife Research and Management Ltd., p 1-46.

- Proulx, G., and M.W. Barrett. 1993. Field testing of the C120 Magnum for mink. *Wildlife Society Bulletin*. 21:421-426.
- Proulx, G., M.W. Barrett, and S.R. Cook. 1989. The C120 Magnum: an effective quick-kill trap for marten. *Wildlife Society Bulletin*. 17:294-298.
- Proulx, G., I.M. Pawline, D.K. Onderka, M.J. Badry, and K. Seidel. 1994. Field evaluation of the number 1 ½ steel-jawed leghold and the Sauvageau 2001-8 traps to humanely capture arctic fox. *Wildlife Society Bulletin*. 22:179-183.
- Quinn, N.W.S., and G. Parker. 1987. Lynx in M. Novak, J.A. Barber, M.E. Obbard, B. Malloch (eds.). *Wild furbearer management and conservation in North America*. Ontario Ministry of Natural Resources
- Redig, P. 1981. Significance of trap-induced injuries to bald eagles. Pages 45-53 in *Eagle Valley Environmental Technical Report BED 81*. University of Minnesota. St. Paul.
- Robinson, L. 2006. Ecological relationships among partial harvesting vegetation, snowshoe hares, and Canada lynx in Maine. M.S. Thesis, University of Maine, Orono. 184pp.
- Route, B., S. Windels, and J. Schaberl. 2006. Status of Canada lynx in and adjacent to Voyageurs National Park, Minnesota, 2000-2004. U.S. Dept. of Interior, National Park Service, Great Lakes Inventory and Monitoring Network. Technical Report GLKN/2006/03.
- Ruediger, B., J. Claar, S. Gniadek, B. Holt, L. Lewis, S. Mighton, B. Naney, G. Patton, T. Rinaldi, J. Trick, A. Vandehey, F. Wahl, N. Warren, D. Wenger, and A. Williams. January 2000. Canada lynx conservation assessment and strategy, second edition. U.S. Forest Service, U.S. Fish and Wildlife Service, U.S. Bureau of Land Management, U.S. National Park Service. Forest Service Publication #R1-00-53, Missoula, Montana.
- Ruggiero, L.F., K.B. Aubry, S.W. Buskirk, G.M. Koehler, C.J. Krebs, K.S. McKelvey, and J.R. Squires. 1999. Ecology and Conservation of Lynx in the United States. United States Department of Agriculture, Forest Service, Rocky Mountain Research Station. General Technical Report RMRS-GTR-30WWW.
- Ruggiero, L.F., K.B. Aubry, S.W. Buskirk, G.M. Koehler, C.J. Krebs, K.S. McKelvey, J.R. Squires. 2000. The scientific basis for lynx conservation: qualified insights. In Ruggiero, L.F., K.B. Aubry, S.W. Buskirk, *et al.*, tech. eds. The scientific basis for lynx conservation in the contiguous United States. Gen. Tech. Rpt. RMRS-GTR-30. Ogden, UT: U.S. Dept. Agriculture, Forest Service, Rocky Mountain Research Station.

Scott, S.A. 2009. Spatio-temporal dynamics of snowshoe hare density and relationships to Canada Lynx occurrence in northern Maine. Masters thesis. University of Maine, Orono, Maine. 190pp.

Seddon P.J., VanHeezik Y., Maloney R.F. 1999. Short- and medium-term evaluation of foothold trap injuries in two species of fox in Saudi Arabia. In: Proulx G, ed. Mammal Trapping. Sherwood Park Alberta: Alpha Wildlife Research and Management Ltd., p 67-78.

Seymour, R. S. and M. L. Hunter, Jr. 1992. New forestry in eastern spruce-fir forests: Applications to Maine. Maine Agricultural Experiment Station Misc. Pub. 716.

Shivik, J.A., D.J. Martin, M.J. Pipas, J. Turnan, and T.J. DeLiberto. 2005. Initial comparison: jaws, cables, and cage traps to capture coyotes. Wildlife Society Bulletin. 33(4):1375-1383.

Simons, E.M. 2009. Influences of past and future forest management on the spatiotemporal dynamics of habitat supply for Canada lynx and American martens in northern Maine. Doctoral Dissertation, University of Maine, Orono, Maine. 247pp.

Squires, J.R., S. Tomson, L.F. Ruggiero, and B. Oakleaf. 2001. Distribution of lynx and other forest carnivores in the Wyoming Range, south-central Wyoming, progress report: winters 2000 and 2001. Unpublished report, U.S. Department of Agriculture Forest Service, Rocky Mountain Research Station, Missoula, Montana.

Steury, T.D., and D.L. Murray. 2004. Modeling the reintroduction of lynx to the southern portion of its range. Biological Conservation. 117:127-141.

Stocek, R. F and D. J. Cartwright. 1985. Birds as non-target catches in the New Brunswick furbearer harvest. Wildlife Society Bulletin 13:314-317.

Strickland, D. and H. Ouellet. 1993. Gray jay (*Perisoreus canadensis*). In the Birds of North American No. 40. A. Poole, P. Stettenheim, and F. Gill, editors. Academy of Natural Sciences, Philadelphia and American Ornithologist's Union, Washington, D.C.

Todd, C.S. 2000. Golden eagle assessment. Maine Department of Inland Fisheries and Wildlife, Bangor, ME.

Todd, C.S. 2004. Bald eagle assessment. Maine Department of Inland Fisheries and Wildlife, Bangor, Maine.

Turkowski, F.J., A.R. Armistead, and S.B. Linhart. 1984. Selectivity and effectiveness of pan tension devices for coyote foothold traps. *Journal of Wildlife Management*. 48:700-708.

U.S. Fish and Wildlife Service (USFWS). 2000. Endangered and threatened wildlife and plants; determination of threatened status for the contiguous United States distinct population segment of the Canada lynx and related rule; final rule. Fish and Wildlife Service. *Federal Register* 65:16052-16086.

U.S. Fish and Wildlife Service (USFWS). 2002. Letter from Gordon Russell, USFWS Maine Field Office Supervisor, to Ken Elowe and Mark Stadler of IF&W dated December 24, 2002.

U.S. Fish and Wildlife Service (USFWS). 2003. Notice of remanded determination of status for the contiguous United States distinct population segment of the Canada lynx. *Federal Register* 68: 40076-40101.

U.S. Fish and Wildlife Service (USFWS). 2005. Recovery Outline: Contiguous United States Distinct Population Segment of the Canada Lynx. September 14, 2005.

U.S. Fish and Wildlife Service (USFWS). 2007. Letter from Michael J. Bartlett, U.S. Fish and Wildlife Service Supervisor, New England Field Office to Ken Elowe, Director, Bureau of Resource Management, Maine Dept. of Inland Fisheries and Wildlife regarding DIFW's June 29, 2007 incidental take permit application and associated Incidental Take Plan, dated October 23, 2007.

U.S. Fish and Wildlife Service (USFWS), Maine Field Office. Environmental Assessment for issuance of a 10(a)(1)(B) permit for the incidental take of the Canada lynx (*Lynx canadensis*). Dated August, 2011.

U.S. Fish and Wildlife Service. Undated. Canada lynx and Climate Change. Available at: <http://www.fws.gov/northeast/climatechange/stories/lynx.html>

Van Ballenberghe, V. 1984. Injuries to wolves sustained during live-capture. *Journal of Wildlife Management* 48:1425-1429.

Vashon, J.H., J.F. Organ, W.J. Jakubas, A.D. Vashon, G.J. Matula Jr., C.R. McLaughlin, and S.M. Crowley. 2005. Reproduction and mortality of Canada lynx (*Lynx canadensis*) in northern Maine. Unpubl. report, Maine Department of Inland Fisheries and Wildlife, Bangor.

Vashon, J.H. et al. 2008. Spatial Ecology of a Canada Lynx Population in Northern

Maine. *Journal of Wildlife Management* 72:1479-1487.

Warburton, B., N. Gregory, and M. Nunce. 1999. Stress response of Australian brushtail possums captured in foot-hold and cage traps. In: Proulx, G. (editor). *Mammal Trapping* pp. 53-66. Alpha Wildlife Research & Management Ltd: Alberta, Canada.

Ward, R. P. M. and C. J. Krebs. 1985. Behavioural responses of lynx to declining snowshoe hare abundance. *Can. J. Zool.* 63:2817-2824.

Waller, D. J. 1981. Effectiveness of kill-type traps versus leg-hold traps utilizing dirt-hole sets. *Proceedings of the Annual Conference of the Southeastern Association Fish & Wildlife Agencies* 35:256-260.

White, P.J., T.J. Kreeger, U.S. Seal, and J.R. Tester. 1991. Pathological responses of red foxes to capture in box traps. *Journal of Wildlife Management.* 55:75-80.

Whitman, A., B. Vickery, P. deMaynadier, S. Stockwell, S. Walker, A. Cutko, and R. Houston. 2010. *Climate change and biodiversity in Maine.* Manomet Center for Conservation Sciences, Brunswick, Maine.

Zesiger, S. 1997. Zero to sixty in three seconds (cold). *Fortune* 135(6):178.