OPINION/COMMENTARY

Spruce Haven Nature Park

(formerly known as Spruce Haven Zoo)

Prepared by Dr. Martyn Obbard

for

Zoocheck

788 1/2 O'Connor Drive

Toronto, ON

M4B 2S6

7 July 2017

EXECUTIVE SUMMARY:

At the request of Zoocheck I visited Spruce Haven Nature Park on 14 June 2017. I toured the facility unescorted and focussed my attention on the carnivore housing conditions, as well as the appearance and behaviour of the animals. My visit was not announced in advance..

My observations of the facility and its animals, informed by my expertise and experience with carnivores in past decades, inform my opinion that:

1. The facility does not appear to comply with several regulations under the Ontario Society for Prevention of Cruelty to Animals Act, O.Reg. These include Section 2 (1), Section 2 (5), Section 2 (6), and Section 2 (7),

2. The facility does not comply with the requirements under condition 1 of the OMNRF Licence to Keep Specially Protected and Game Wildlife in a Zoo,

3. The size of enclosures and lack of enrichment put the health and welfare of the carnivores at risk, especially in light of the fact that some of the animals have been held in these conditions for many years,

4. Spruce Haven Nature Park lacks the space or complexity to properly accommodate the needs of the carnivores which will impact them physically and psychologically. In addition, there was no evidence that conditions for the animals had improved substantially since a visit by M. Hamers in 2013,

5. The lack of an appropriate perimeter fence surrounding the facility is a potential public safety risk should animals escape their holding pen,

6. The carnivores (lions, cougar, wolves, coyote and bear) should be moved as soon as possible to more appropriate accommodation that can properly satisfy their full range of physical and behavioural needs.

ABOUT THE AUTHOR:

Martyn Obbard obtained his undergraduate degree in Zoology at the University of Western Ontario, and his M.Sc. and Ph.D. (1983) in Wildlife Ecology at the University of Guelph. Martyn was employed by the Ontario Ministry of Natural Resources from 1984-2016 and spent from 1989-2016 in the wildlife research section of the ministry. He conducted long-term studies on the ecology, population dynamics, and behaviour of black bears in Ontario in the boreal forest (1989-2001), Bruce Peninsula (1998-2006), and in Algonquin Park (2006-2015). He also conducted long-term research on the ecology, population dynamics, and behaviour of polar bears in Ontario from 1993-2016. Currently, Martyn is an Emeritus Research Scientist with the Ontario Ministry of Natural Resources and Forestry. He has an interest in issues such as human-bear conflict and welfare of captive carnivores, especially bears. The curriculum vitae for Martyn E. Obbard is attached to this report as Appendix 3.

BACKGROUND:

Spruce Haven Nature Park (formerly known as Spruce Haven Zoo) is located about 20 minutes' drive from downtown Sault Ste. Marie, Ontario. The facility is owned and operated by the Marshall family and has been in existence since the 1980s. The mission statement for Spruce Haven Nature Park as shown on the brochure and the website (www.sprucehaven.ca) is as follows: *Our mission is to provide an opportunity for children and adults to connect with the real natural world of animals and nature through an outdoors experience.*

The website indicates that the facility offers "*An assortment of wildlife and non-native species housed in areas separated by trees, ponds, and green space. This includes deer, cougar, bear, lion, wild yak, llama, mountain goat and more"*. The site also promotes a nature walk program and states: "*If you are part of the group hike program, you will be exposed to natures finest in plants, trees, gardens, and will be part of the program discussing the role of humans in affecting the balance of nature and the environment."*

Since 1999, Zoocheck has expressed concerns about the conditions for captive animals at Spruce Haven. The zoo was visited several times between 1999 and 2013 to assess the housing conditions of the animals. These visits resulted in reports that evaluated the wildlife compound and provided recommendations to improve welfare and public safety. There were some recurring issues regarding size of enclosures, diets provided to the animals, lack of enrichment, and the construction quality of the enclosures. A comprehensive report was prepared in 2013 (Hamers 2013); this report suggested that few improvements had been made, that the facility still did not meet acceptable minimum standards for husbandry of captive wildlife in Ontario, and that the welfare of the carnivores in captivity was seriously deprived (Hamers 2013).

Because of the apparent lack of improvement in husbandry practices at Spruce Haven, especially for carnivores, I was asked to visit the facility to assess the current situation for captive animals. Accordingly, I visited Spruce Haven on 14 June 2017. I toured the facility unescorted from about 10:30 to 11:30 a.m., focusing on the captive carnivores. I did not visit the petting zoo area. Air temperature at the time was about 20° C.

FINDINGS:

GENERAL IMPRESSIONS:

- **a.** There is no well-designed perimeter fencing enclosing the pens where the carnivores are housed. If any of these animals escaped this could be a danger for nearby neighbours as escapees would be free to leave the zoo property.
- **b.** The pens are too small to provide carnivores with the opportunity for exercise and a reasonable amount of normal movement.
- **c.** The lions, black bear, and cougar appeared lethargic and showed little interest in their surroundings.
- **d.** At times, the cougar appeared agitated and stressed and was observed hissing and snarling repeatedly at passersby.
- **e.** The substrate of all pens was hard-packed earth with no natural vegetation.
- **f.** Attempts to provide complexity to the interior or pens appeared minimal and little was provided for enrichment.

Text of the *Ontario Society for the Prevention of Cruelty to Animals Act, ONTARIO REGULATION 60/09, Standards of Care and Administrative Standards, Part I and Part II* is provided in Appendix 1.

AFRICAN LION:

Two female lions are housed in this enclosure. Strong-smelling bony remnants of food were scattered on the dirt floor (Fig. 1); there was no fresh food visible though I did not determine when normal feeding time would be. The floor of the enclosure is hard packed soil. There is a wooden structure on which the lions were lying (Figs. 1, 2). Both animals were lethargic and showed little interest in their surroundings. The enclosure is not large enough to provide adequate opportunity for movement and exercise. No enrichment was observed.

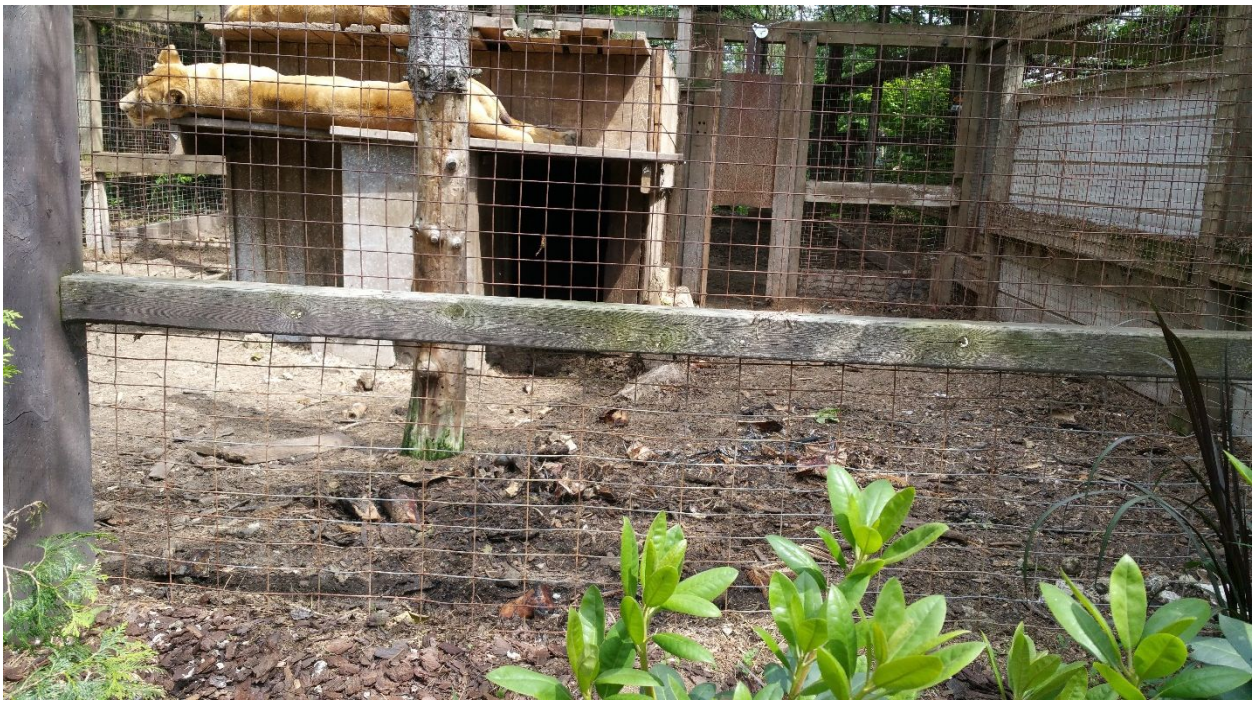

Fig. 1. African lion enclosure at Spruce Haven showing hard-packed substrate, and bony remains from previous feedings, 14 June 2017.

Fig. 2. Rear view of enclosure for African lions at Spruce Haven Nature Park, 14 June 2017.

COUGAR:

A single cougar is housed in this enclosure. The animal lay close to the fencing beside the pathway between enclosures during the time I was there and hissed and snarled repeatedly at passersby (Fig. 3). This suggests to me that the animal was agitated or stressed by being so close to passersby without a private area to provide relief from being in public view. Water was provided in a plastic pail, but I could not assess whether the water was fresh and clean. The substrate of the enclosure was hard-packed soil. A few branches on the ground seemed to be what was provided for enrichment (Fig. 4).

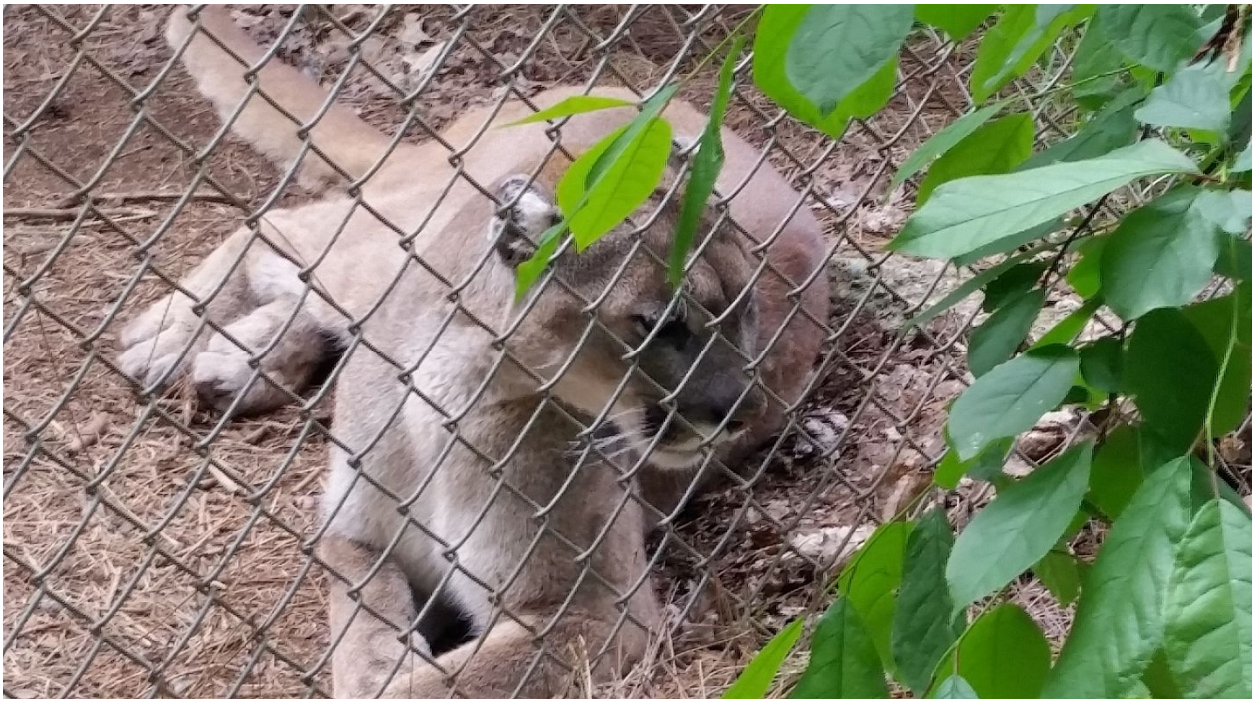

Fig. 3. Cougar laying close to fence of enclosure, near to pathway. The animal hissed frequently at passersby.

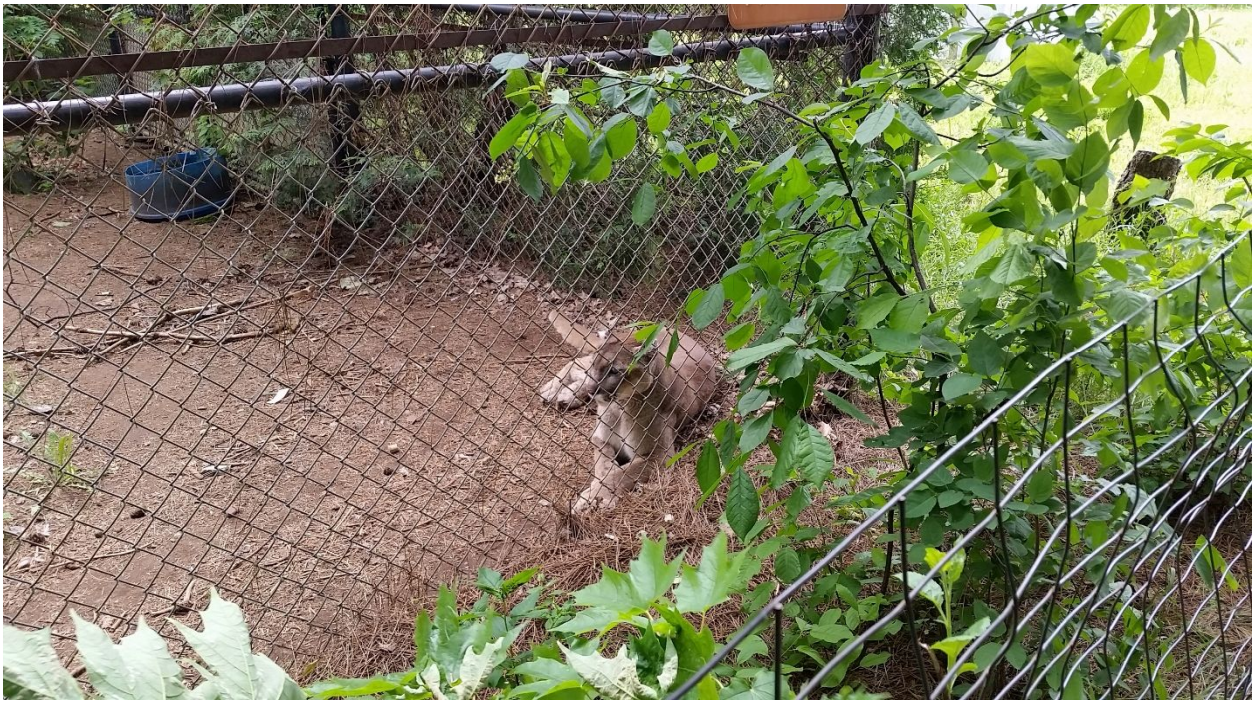

Fig. 4. Cougar enclosure showing water container and substrate of hard-packed soil.

AMERICAN BLACK BEAR:

A single male black bear is housed in this enclosure. A staff member told me the bear ("Ben") had been in the enclosure for more than 20 years. The bear appeared to be obese and was lethargic. The enclosure is too small to provide adequate room for movement and exercise. A car tire hung from a chain and several logs lying on the ground appear to be the only form of enrichment, but these are completely inadequate in providing meaningful enrichment (Fig. 5). Water is provided in a small metal basin. I could not determine whether the water was fresh and clean. A small white metal bath tub sunk into the ground appears to provide a bathing area; the water was shallow, stagnant and appeared to be dirty and discoloured (Fig. 6). The substrate of the enclosure is hard-packed soil (Fig. 4). There is no material provided that a bear could use to make a soft day bed which is what bears typically do during spring to fall. There was no reasonable opportunity for the bear to climb or otherwise move normally beyond walking a few steps in one direction or another.

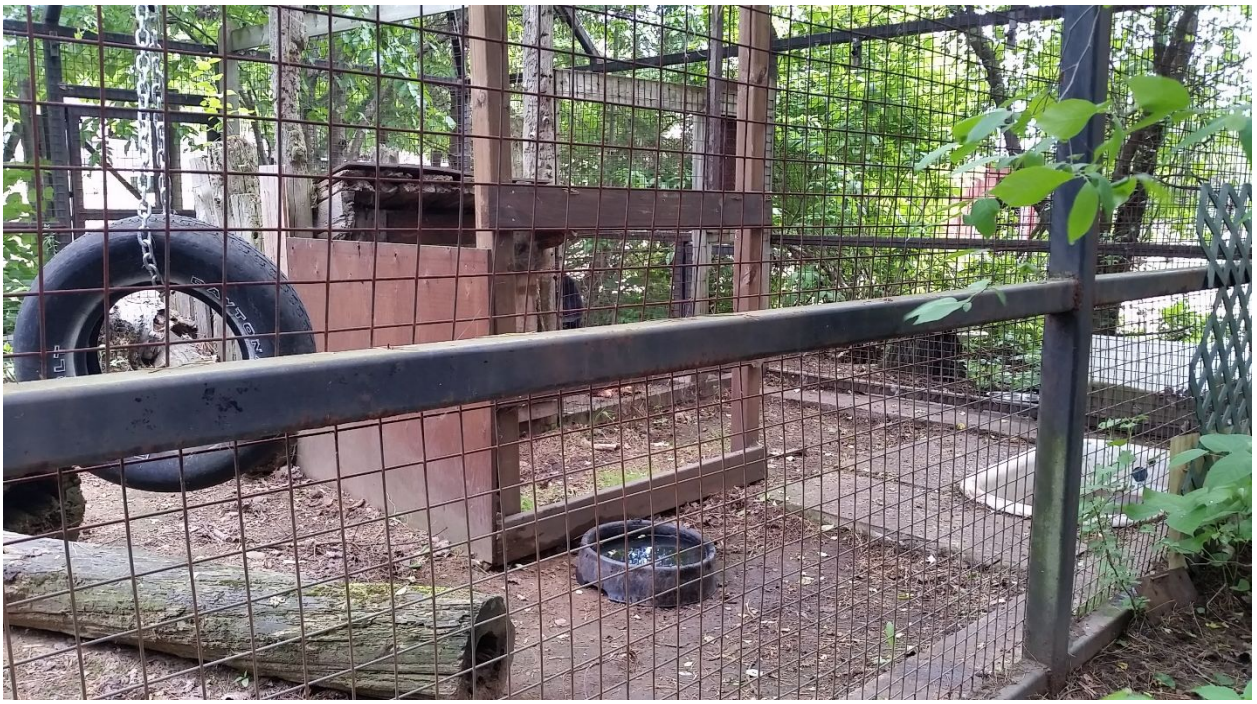

Fig. 5. Black bear enclosure showing tire and log presumably provided as enrichment, hard-packed substrate, small water basin, and bathtub.

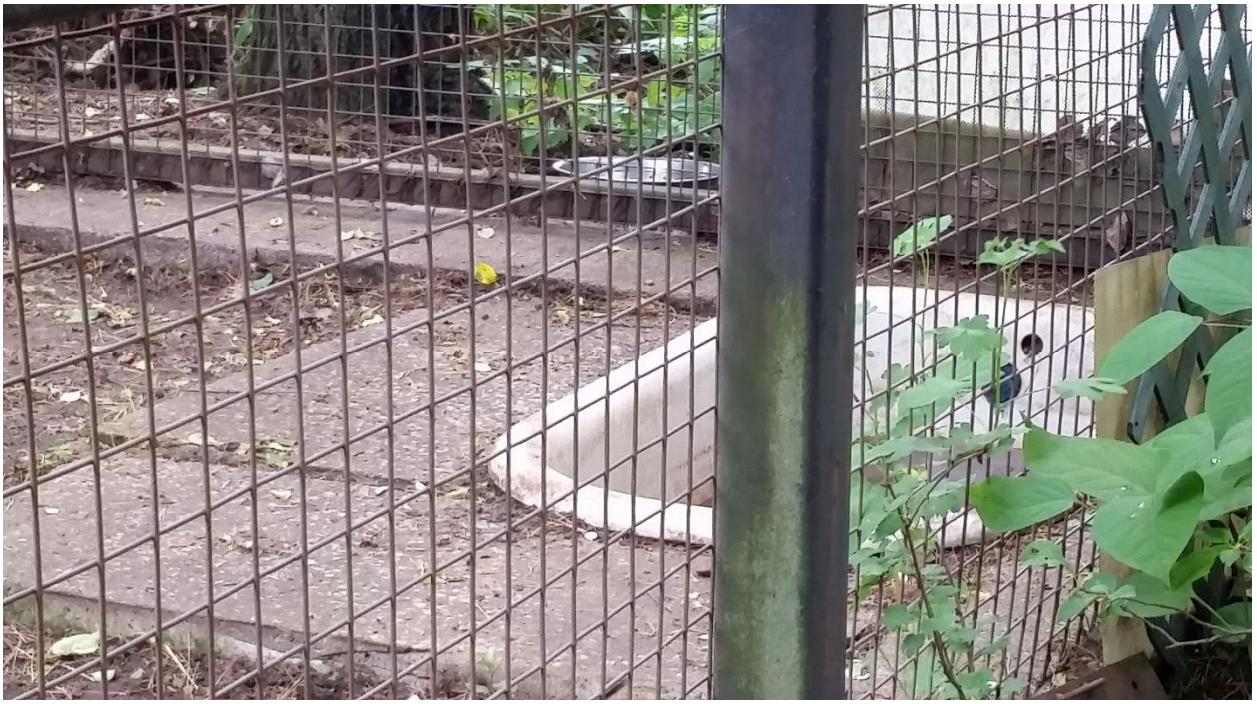

Fig. 6. Black bear enclosure showing small metal bathtub containing shallow, discoloured and dirty water.

There is a wooden structure which I assume is provided as a winter den; it was in a state of disrepair (Fig. 7). During the time I observed the bear it ate half-heartedly for a few minutes at some food left on the ground (appeared to be various kinds of fruit) in the back portion of the enclosure (Fig. 8). Otherwise, the bear was listless, inactive and lay in a portion of the enclosure where a plywood sheet was propped against the fencing, presumably in an attempt to provide some privacy for the bear (Fig. 9).

Fig. 7. Black bear enclosure showing dilapidated wooden structure, presumably provided as a winter denning structure.

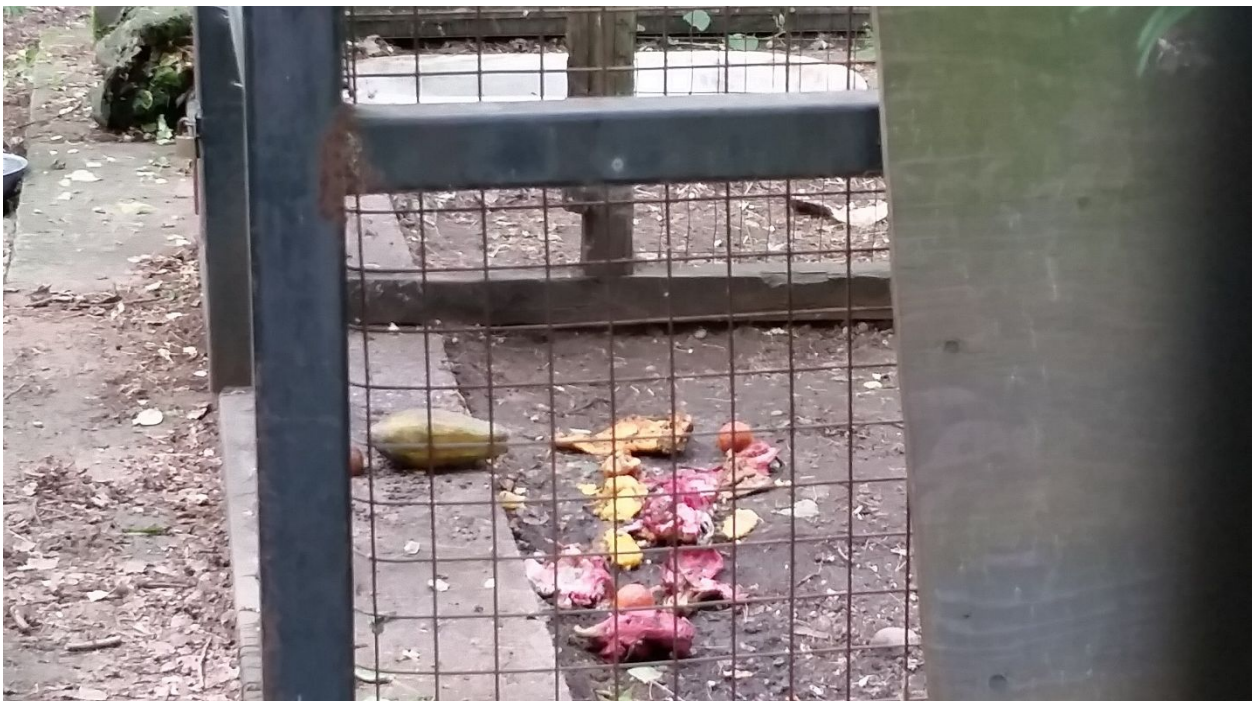

Fig. 8. Food (appears to be various kinds of fruit) placed on the ground to the rear of the bear enclosure.

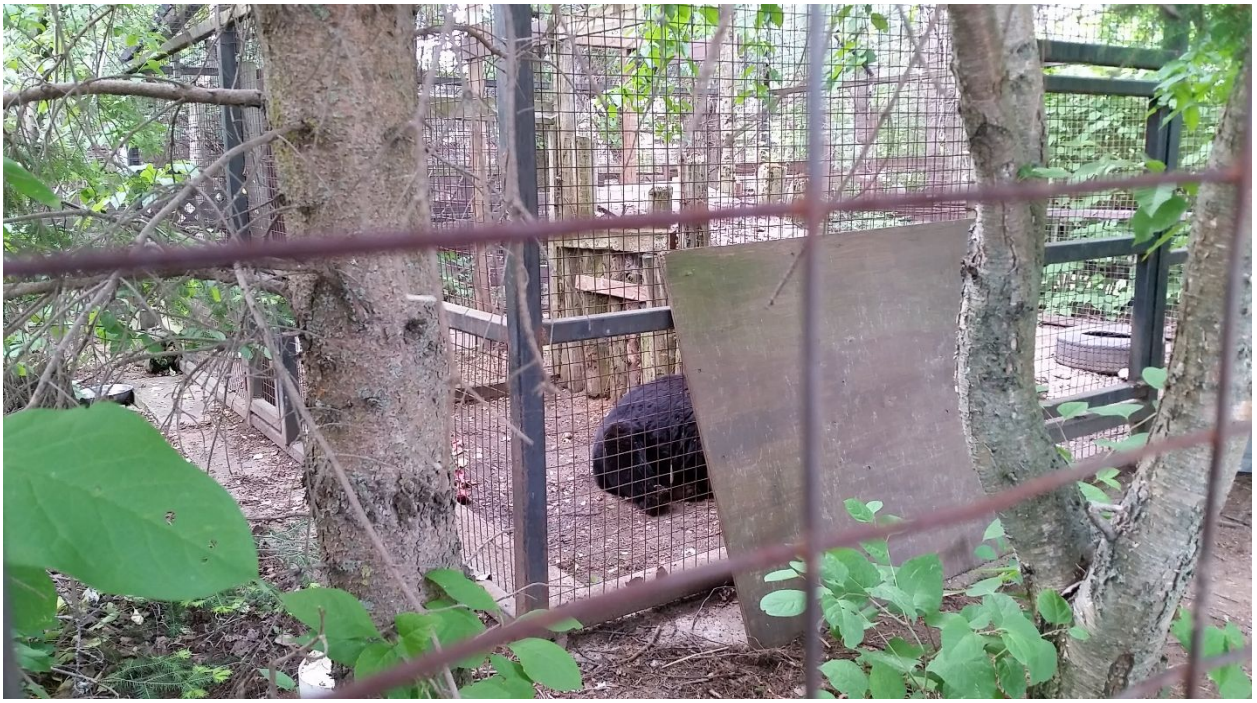

Fig. 9. Black bear, “Ben” was listless and inactive during my visit. Presumably, plywood sheet is meant to provide some privacy from visitors.

WOLF:

A pair of wolves were housed in an enclosure that is much larger than that provided for the African lions, cougar, or black bear. Nevertheless, only limited movement for exercise would be possible in the enclosure. I was told that the pair had a litter of pups but I did not see them. A large pile of brush was provided, under which the wolves appeared to have dug a den. The male was near the den when I approached the enclosure and moved quickly away. The female appeared from the den after a few minutes and moved away to stand beside the male. The substrate of the enclosure is hard-packed soil. I did not see a container for water, but it may not have been visible from my location.

CONCLUSIONS

A. OSPCA Act regulations

My assessment is that Spruce Haven Nature Park is not in compliance with several sections of the OSPCA Act Regulation 60/09.

1. **Section 2.** (1) Every animal must be provided with adequate and appropriate food and water. O. Reg. 60/09, s. 2 (1).

   Adequate fresh water did not appear to be provided to the carnivores (see comments above on individual species).

2. **Section 2**. (5) Every animal must be provided with an adequate and appropriate resting and sleeping area. O. Reg. 60/09, s. 2 (5).

   The resting and sleeping areas provided were inadequate. There was no shade over the platform in the lion enclosure and the presumed sleeping/denning box provided for the black bear was in serious disrepair.

3. **Section 2**. (6) Every animal must be provided with adequate and appropriate,

   (a) space to enable the animal to move naturally and to exercise;

   (b) sanitary conditions;

   (c) ventilation;

   (d) light, and;

   (e) protection from the elements, including harmful temperatures. O. Reg. 60/09, s. 2 (6).

   The space available to the carnivores, especially the African lions, American black bear and cougar, was inadequate to enable the animals to exercise normally. In addition there was little provided in the enclosures that would provide behavioural enrichment to the animals. Hence, the animals were lethargic, presumably because they had nothing to do except wait until the next feeding time. Protection from the elements was minimal.

4. **Section 2.** (7) If an animal is confined to a pen or other enclosed structure or area,

   (a) the pen or other enclosed structure or area, and any structures or material in it, must be in a state of good repair;

   The integrity of the black bear enclosure was compromised. Part of the wire perimeter of the pen appeared to have been repaired with wooden boards (Fig. 10). This may have been repaired because the bear tried to dig under the fencing. The presumed denning box for the bear was in disrepair.

Fig. 10. American black bear showing area of fencing at rear right corner that appeared to be repaired with wooden boards.

5. Spruce Haven Nature Park did not appear to comply with Section 4. Standards of Care for Captive Wildlife,

    a. For example, under ***Section 4.*** *(1) Wildlife kept in captivity must be provided with adequate and appropriate care, facilities and services to ensure their safety and general welfare as more specifically set out in subsections (2) and (3) of this section and in sections 5 and 6. O. Reg. 60/09, s. 4 (1),*

    There was a serious lack of enrichment provided to the animals. This is a major concern for all animals held in captivity, but especially for highly intelligent carnivores. These animals could not express many normal movements or behaviours.

    b. Under ***Section 4.*** *(2) Wildlife kept in captivity must be provided with a daily routine that facilitates and stimulates natural movement and behaviour. O. Reg. 60/09, s. 4 (2).*,

    The animals were lethargic and unstimulated by their surroundings. I saw no evidence that animals had the space that would enable "natural movement and behaviour".

6. There did not appear to be compliance with Section 5. Standards for Enclosures for Captive Wildlife.

    a. For example, under ***Section 5.*** *(1) A pen or other enclosed structure or area for wildlife kept in captivity must be of an adequate and appropriate size, (a) to facilitate and stimulate natural movement and behaviour;*

The pens for the captive carnivores are too small to facilitate and stimulate natural movement and behaviour. Hence, the animals were unresponsive and lethargic and the American black bear appeared to be obese.

7. Under ***Section 5.*** (2) A pen or other enclosed structure or area for wildlife kept in captivity must have,

(a) features and furnishings that facilitate and stimulate the natural movement and behaviour of each animal in the pen or other enclosed structure or area;

(b) shelter from the elements that can accommodate all the animals in the pen or other enclosed structure or area at the same time;

(c) surfaces and other materials that accommodate the natural movement and behaviour of each animal in the pen or other enclosed structure or area;

(d) one or more areas that are out of view of spectators; and

(e) one or more sleeping areas that can accommodate all the animals in the pen or other enclosed structure or area at the same time and that are accessible to all the animals at all times. O. Reg. 60/09, s. 5 (2).

Under (a) the features or furnishings provided to stimulate natural movement and behaviour were inadequate to achieve that purpose. Under (b), shelter from rain would very likely be inadequate in all pens. Under (c), again pens and materials therein were unlikely to stimulate natural movement and behaviour. Under (d) animals would have great difficulty being out of the view of spectators. As noted previously, the cougar appeared agitiated and/or distressed by the presence of visitors.

B. Hamers (2013) report.

This is a well-written, well-researched report which provides important background on why it is important to ensure the well-being of animals in captivity and the reasons for, and advantages of, providing meaningful enrichment as a way of reducing the negative effects of captivity. The report summarises the state of the animal holding facilities as of 22 May 2013. Based on the content of the report and my observations during my 14 June 2017 visit to Spruce Haven, it would appear that little has changed to improve the conditions for carnivores at the facility.

C. OMNRF Permit conditions.

A copy of the OMNRF permit and conditions for Spruce Haven Nature Park can be found as Appendix 2. In my opinion, based on my observations during my 14 June 2017 visit to Spruce Haven, the facility does not meet any of the requirements under condition 1 (shown below and in Appendix 2).

1. Animal enclosures in which animals are on public display should be of a size which enable the animals to:

   a) Exercise natural behaviours to facilitate public education and interpretation

   b) Achieve a distance from the public and other specimens at which the animals are not psychologically or physically stressed.

   c) Achieve a full range of body movements and physical movements normally performed.

Re: 1 a) None of the enclosures would enable the animals to show natural behaviours that would facilitate public education and interpretation in any way. The enclosure were cramped and allowed animals little opportunity for movement beyond a few paces, never mind allowing them to show natural behaviour that might facilitate public education.

Re: 1 b) None of the animals could achieve sufficient distance from the public to avoid becoming psychologically or physically stressed. A particular case in point was the cougar which hissed repeatedly at passers-by.

Re: 1 c) In my opinion none of the enclosures were large enough to enable animals to achieve a full range of body movements and physical movements normally performed. It could be argued that the wolf enclosure might meet a minimum size under this condition, but all other enclosures were far too small to meet this requirement. All animals were lethargic, appeared disinterested in their surroundings, and did not express natural movements or exploratory behaviour.

RECOMMENDATION

Spruce Haven Nature Park provides only rudimentary housing and care conditions for its carnivores. Based on reports about the conditions in previous years, it appears that few, if any, substantive improvements that would enhance the welfare and wellbeing of the animals have been made. Cages and enclosures are lacking in space and environmental complexity and do not properly address the needs of the carnivores. For those reasons, I recommend that the carnivores be moved as soon as possible to more appropriate accommodation that can properly satisfy their full range of physical and behavioural needs.

APPENDIX 1

Ontario Society for the Prevention of Cruelty to Animals Act

ONTARIO REGULATION 60/09

STANDARDS OF CARE AND ADMINISTRATIVE STANDARDS

Historical version for the period May 1, 2016 to April 30, 2017.

Last amendment: O. Reg. 438/15.

This is the English version of a bilingual regulation.

PART I
APPLICATION AND DEFINITION

Application

1. (1) The basic standards of care applicable to all animals are set out in section 2. O. Reg. 60/09, s. 1 (1).

(2) In addition to the basic standards of care applicable to all animals set out in section 2,

(a) standards of care specific to dogs that live primarily outdoors are set out in section 3; and

(b) standards of care specific to wildlife kept in captivity are set out in sections 4 and 5. O. Reg. 60/09, s. 1 (2).

(3) In addition to the basic standards of care applicable to all animals set out in section 2 and the standards of care specific to wildlife kept in captivity set out in sections 4 and 5, the standards of care specific to primates kept in captivity are set out in section 6. O. Reg. 60/09, s. 1 (3).

(3.1) In addition to the basic standards of care applicable to all animals set out in section 2 and the standards of care specific to wildlife kept in captivity set out in sections 4 and 5, the standards of care and administrative standards specific to marine mammals kept in captivity are set out in Part III. O. Reg. 438/15, s. 3.

(4) A requirement that a standard of care be adequate and appropriate or necessary is a requirement that the standard of care be adequate and appropriate or necessary to the specific animal, having regard to its species, breed and other relevant factors. O. Reg. 60/09, s. 1 (4).

Definitions

1.1 In this Regulation,

"animal welfare committee", in relation to a marine mammal, means an animal welfare committee that meets the requirements of section 7 and that develops an animal welfare plan for the marine mammal; ("comité du bien-être animal")

"animal welfare plan", in relation to a marine mammal, means an animal welfare plan that has been completed for the marine mammal and that meets the requirements of section 8; ("plan de bien-être animal")

"marine mammal" means a sea otter (Enhydra lutris) or a member of the order Cetacea (whales, dolphins and porpoises), the order Sirenia (manatees and dugongs) or, within the order Carnivora, a member of the family Phocidae (true seals), the family Otariidae (eared seals and sea lions) or the family Odobenidae (walruses); ("mammifère marin")

"marine mammal veterinarian" means a veterinarian who has experience with marine mammal biology and marine mammal medicine, including marine mammal pharmacology. ("vétérinaire spécialiste des mammifères marins") O. Reg. 438/15, s. 4.

PART II
GENERAL STANDARDS OF CARE FOR ANIMALS

Basic standards of care for all animals

2. (1) Every animal must be provided with adequate and appropriate food and water. O. Reg. 60/09, s. 2 (1).

(2) Every animal must be provided with adequate and appropriate medical attention. O. Reg. 60/09, s. 2 (2).

(3) Every animal must be provided with the care necessary for its general welfare. O. Reg. 60/09, s. 2 (3).

(4) Every animal must be transported in a manner that ensures its physical safety and general welfare. O. Reg. 60/09, s. 2 (4).

(5) Every animal must be provided with an adequate and appropriate resting and sleeping area. O. Reg. 60/09, s. 2 (5).

(6) Every animal must be provided with adequate and appropriate,

(a) space to enable the animal to move naturally and to exercise;

(b) sanitary conditions;

(c) ventilation;

(d) light, and;

(e) protection from the elements, including harmful temperatures. O. Reg. 60/09, s. 2 (6).

(7) If an animal is confined to a pen or other enclosed structure or area,

(a) the pen or other enclosed structure or area, and any structures or material in it, must be in a state of good repair;

(b) the pen or other enclosed structure or area, and any surfaces, structures and materials in it, must be made of and contain only materials that are,

(i) safe and non-toxic for the animal, and

(ii) of a texture and design that will not bruise, cut or otherwise injure the animal; and

(c) the pen or other enclosed structure or area must not contain one or more other animals that may pose a danger to the animal. O. Reg. 60/09, s. 2 (7).

(8) Every animal that is to be killed must be killed by a method that is humane and minimizes the pain and distress to the animal; an animal's pain and distress are deemed to be minimized if it is killed by a method that produces rapid, irreversible unconsciousness and prompt subsequent death. O. Reg. 60/09, s. 2 (8).

Standards of care for dogs that live outdoors

3. (1) Every dog that lives primarily outdoors must be provided with a structurally sound enclosure for its use at all times. O. Reg. 60/09, s. 3 (1).

(2) The enclosure must be weather-proofed and insulated. O. Reg. 60/09, s. 3 (2).

(3) The size and design of the enclosure must be adequate and appropriate for the dog. O. Reg. 60/09, s. 3 (3).

(4) A chain, rope or similar restraining device used to tether a dog that lives primarily outdoors,

(a) must be at least three metres long;

(b) must allow the dog to move safely and unrestricted (except by its length); and

(c) must allow the dog to have access to adequate and appropriate water and shelter. O. Reg. 60/09, s. 3 (4).

Standards of care for captive wildlife

4. (1) Wildlife kept in captivity must be provided with adequate and appropriate care, facilities and services to ensure their safety and general welfare as more specifically set out in subsections (2) and (3) of this section and in sections 5 and 6. O. Reg. 60/09, s. 4 (1).

(2) Wildlife kept in captivity must be provided with a daily routine that facilitates and stimulates natural movement and behaviour. O. Reg. 60/09, s. 4 (2).

(3) Wildlife kept in captivity must be kept in compatible social groups to ensure the general welfare of the individual animals and of the group and to ensure that each animal in the group is not at risk of injury or undue stress from dominant animals of the same or a different species. O. Reg. 60/09, s. 4 (3).

Standards for enclosures for captive wildlife

5. (1) A pen or other enclosed structure or area for wildlife kept in captivity must be of an adequate and appropriate size,

(a) to facilitate and stimulate natural movement and behaviour;

(b) to enable each animal in the pen or other enclosed structure or area to keep an adequate and appropriate distance from the other animals and people so that it is not psychologically stressed; and

(c) to ensure that the natural growth of each animal in the pen or other enclosed structure or area is not restricted. O. Reg. 60/09, s. 5 (1).

(2) A pen or other enclosed structure or area for wildlife kept in captivity must have,

(a) features and furnishings that facilitate and stimulate the natural movement and behaviour of each animal in the pen or other enclosed structure or area;

(b) shelter from the elements that can accommodate all the animals in the pen or other enclosed structure or area at the same time;

(c) surfaces and other materials that accommodate the natural movement and behaviour of each animal in the pen or other enclosed structure or area;

(d) one or more areas that are out of view of spectators; and

(e) one or more sleeping areas that can accommodate all the animals in the pen or other enclosed structure or area at the same time and that are accessible to all the animals at all times. O. Reg. 60/09, s. 5 (2).

(3) A pen or other enclosed structure or area for wildlife kept in captivity must be made of and contain only materials that are,

(a) safe and non-toxic for the animals kept in the pen or other enclosed structure or area; and

(b) of a texture and design that will not bruise, cut or otherwise injure the animals. O. Reg. 60/09, s. 5 (3).

(4) A pen or other enclosed structure or area for wildlife kept in captivity and any gates or other barriers to it, including moats, must be designed, constructed and locked or otherwise secured to prevent,

(a) interaction with people that may be unsafe or inappropriate for the wildlife;

(b) animals escaping from the pen or other enclosed structure or area by climbing, jumping, digging, burrowing or any other means; and

(c) animals or people (other than people who are required to enter the enclosure as part of their duties) from entering the pen or other enclosed structure or area by climbing, jumping, digging, burrowing or any other means. O. Reg. 60/09, s. 5 (4).

(5) A pen or other enclosed structure or area for wildlife kept in captivity and any gates or other barriers to it, including moats, must be designed, constructed and maintained in a manner that presents no harm to the wildlife. O. Reg. 60/09, s. 5 (5).

Standards of care for captive primates

6. Every primate kept in captivity must be provided with,

(a) daily interaction with a person having custody or care of the primate;

(b) a varied range of daily activities, including foraging or task-oriented feeding methods; and

(c) interactive furnishings, such as perches, swings and mirrors. O. Reg. 60/09, s. 6.

Appendix 2. OMNRF Permit for Spruce Haven Kennels and Zoo

– sign – Return in envelope attached –

Ontario

Ministry of Natural Resources

Ministère des Richesses naturelles

Licence to Keep Specially Protected and Game Wildlife in a Zoo

Permis pour garder des animaux sauvages spécialement protégés et du gibier sauvage dans un zoo

Licence No. / N° de permis	1015833
Local Reference No. / N° de référence local	5540
Issuer Account No. / N° de compte du délivreur de permis	10000922

This licence is issued under Part I of the Wildlife in Captivity Regulation made under the Fish and Wildlife Conservation Act, 1997 to:

Ce permis est délivré en vertu de la Partie I du règlement sur les animaux sauvages en captivité formulé conformément à la *Loi sur la protection du poisson et de la faune* de 1997 à :

Name of Licencee / Nom du titulaire du permis

Individual / Particulier ▶ Last Name / Nom de famille: Marshall | First Name / Prénom: Helen | Middle Name / Second prénom: Dorothy

Name of Business/Organization/Affiliation (if applicable) / Nom de l'entreprise/de l'organisme/de l'affiliation (le cas échéant): Sprucehaven Kennels and Zoo

OR / OU *Corporation, etc. / Société, etc.* ▶ Name of Corporation / Indian Band / Nom de la société/bande indienne | Corp. # (if applicable) / N° de société (le cas échéant)

OR / OU *Group / Groupe* ▶ Contact's Last Name / Nom de famille de la personne-ressource | First Name / Prénom | Middle Name / Second prénom

Name of Business/Organization/Affiliation (if applicable) / Nom de l'entreprise/de l'organisme/de l'affiliation (le cas échéant)

Mailing address of Licencee / Adresse postale du titulaire du permis

Street Name & No./PO Box/RR#/Gen. Del. / N°, rue/C.P./R.R./poste restante: 2016 Third Line West

City/Town/Municipality / Ville/village/municipalité: Sault Ste. Marie | Province/State / Province/État: ON | Postal Code/Zip Code / Code postal/Zip: P6A 5K8

Applies to a group of individuals only / S'applique à un GROUPE de particuliers seulement

Additional names to appear on licence / Autres noms à inscrire sur le permis

	Last Name / Nom de famille	First Name / Prénom	Middle Name / Second prénom
1			
2			
3			
4			

to keep specially protected wildlife and game wildlife in a zoo.

pour garder des animaux sauvages spécialement protégés et du gibier sauvage dans un zoo.

continued on Page 2 / suite à la page 2

Authorized licence location(s) / Lieu(x) autorisé(s) par le permis	Street Name and No., Lot, Conc. / N°, rue, lot, conc.	City, Township, Municipality / Ville, canton, municipalité
	2016 Third Line West	Sault Ste. Marie

Licence Dates / Dates du permis	Effective Date / Date d'entrée en vigueur (Y/A Y/A Y/A Y/A M M D/J D/J)	Expiry Date / Date d'expiration (Y/A Y/A Y/A Y/A M M D/J D/J)	Licence Fee / Droits du permis	Receipt # / N° de reçu
	2017 01 23	2017 12 31	$ 100.00	$ 5540

This licence is subject to the conditions listed below.
Ce permis doit se conformer aux conditions ci-dessous.

Issued by (please print) / Délivré par (veuillez écrire en caractères d'imprimerie)	Signature of issuer / Signature du délivreur	Date of Issue / Date de délivrance (Y/A Y/A Y/A Y/A M M D/J D/J)
Jacques Landry		2017 01 30

Signature of Licencee / Signature du titulaire du permis	Date (Y/A Y/A Y/A Y/A M M D/J D/J)
Helen Marshall	2017 02 04

Personal information contained on this form is collected under the authority of the *Fish and Wildlife Conservation Act, 1997* and will be used for the purpose of licencing, identification, enforcement, resource management and customer service surveys. Please direct further enquiries to the District Manager of the MNR issuing district.

Les renseignements personnels dans ce formulaire sont recueillis conformément à la *Loi sur la protection du poisson et de la faune*, 1997, et ils seront utilisés aux fins de délivrance de permis, d'identification, d'application des règlements, de gestion des ressources et de sondage sur les services à la clientèle. Veuillez communiquer avec le chef du district du MRN qui délivre le permis si vous avez des questions.

Licence conditions
Conditions du permis

1. Animal enclosures in which animals are on public display should be of a size which enables the animals to:
   a) exercise natural behaviours to facilitate public education and interpretation.
   b) achieve a distance from the public and other specimens at which the animals are not psychologically or physically stressed.
   c) achieve a full range of body movements and physical movements normally performed.
2. Veterinary services must be available for the animal collection.
3. The licence holder must keep a log book that contains information respecting the buying, selling, acquisition, disposition, birth and death of the specimens kept under the authority of this licence. The log book shall be kept for five years after the expiry of the licence.
4. All specially protected raptors or non-indigenous falconry birds must be marked with a clearly and uniquely numbered band of a type approved by the Minister.
5. The log book shall be updated within 24 hours of any event that the ministry has prescribed as being required in the log book, or as reasonably possible.

1. Les enceintes où les animaux sont exposés publiquement devraient être assez grandes pour permettre aux animaux :
   a) d'avoir des comportements normaux afin de faciliter l'éducation du public et l'interprétation,
   b) de pouvoir se tenir à une certaine distance du public et d'autres spécimens afin de ne pas être stressés psychologiquement ou physiquement,
   c) de pouvoir faire une vaste gamme de mouvements corporels et physiques normaux.
2. Des services vétérinaires doivent être disponibles pour prendre soin des animaux récoltés.
3. Le titulaire du permis doit tenir à jour un registre qui renferme des renseignements sur l'achat, la vente, l'acquisition, l'enlèvement, la naissance et la mort des spécimens gardés en vertu de ce permis. Le registre doit être conservé pendant cinq ans après la date d'expiration du permis.
4. Tous les rapaces spécialement protégés ou oiseaux de fauconnerie non indigènes doivent être marqués avec un type de bague portant un numéro unique et facile à voir qui a été approuvé par le ministre.
5. Le journal de bord doit être mis à jour moins de 24 heures après tout événement qui, selon la prescription du ministère, doit être inscrit dans le journal, ou aussitôt que possible.

APPENDIX 3

Curriculum Vitae, Martyn E. Obbard

CURRICULUM VITAE

MARTYN ERNEST OBBARD

Emeritus Research Scientist
Wildlife Research and Monitoring Section
Ontario Ministry of Natural Resources and Forestry
DNA Building, Trent University
2140 East Bank Drive
Peterborough, ON K9J 7B8
Tel.: (705) 755-1549
FAX: (705) 755-1559
E-mail: martyn.obbard@ontario.ca

Adjunct Professor
Environmental and Life Sciences Graduate Program
Trent University

EDUCATION

Ph.D., University of Guelph, Department of Zoology. 1983
Specialization: Wildlife Ecology.
Dissertation title: Population ecology of the common snapping turtle, *Chelydra serpentina*, in north-central Ontario.
Advisor: Dr. R.J. Brooks

M.Sc., University of Guelph, Department of Zoology. 1977
Specialization: Wildlife Behaviour — Graduated with Distinction.
Thesis title: A radio-telemetry and tagging study of activity in the common snapping turtle, Chelydra serpentina.
Advisor: Dr. R.J. Brooks

Dip.Ed., University of Western Ontario, Althouse College of Education. 1970
Specializations: Biology, Chemistry.
Ontario Secondary School Permanent Teacher's Certificate, Type A Biology.

B.A., University of Western Ontario. Major: Zoology. 1968

EXTERNAL RESEARCH FUNDS AWARDED

Environment and Climate Change Canada $35K
Aerial survey of Southern Hudson Bay polar bear subpopulation
M. Obbard 2016/17

Nunavut Wildlife Management Board $20K
Aerial survey of Southern Hudson Bay polar bear subpopulation
M. Obbard 2016/17

Nunavik Marine Region Wildlife Board $20K
Aerial survey of Southern Hudson Bay polar bear subpopulation
M. Obbard 2016/17

World Wildlife Fund Canada – Arctic Species Program $20K
Aerial survey of Southern Hudson Bay polar bear subpopulation
M. Obbard 2016/17

Polar Bears International $15K
Aerial survey of Southern Hudson Bay polar bear subpopulation
M. Obbard 2016/17

Cree Outfitting and Tourism Organization $15K
Aerial survey of Southern Hudson Bay polar bear subpopulation
M. Obbard 2016/17

OMNRF Climate Change Fund $20K
Aerial survey of Southern Hudson Bay polar bear subpopulation
M. Obbard 2016/17

Polar Bears International $30K
Predictors of decreased reproductive success and decreased survival of polar bears in the Southern Hudson Bay subpopulation
M. Obbard 2015/16

Metro Toronto Zoo, Endangered Species Fund $2K
Southern Hudson Bay polar bear research
M. Obbard, 2015/16

Polar Bears International $20K
Predictors of decreased reproductive success and decreased survival of polar bears in the Southern Hudson Bay subpopulation
M. Obbard 2014/15

Metro Toronto Zoo, Endangered Species Fund $2K

Southern Hudson Bay polar bear research
M. Obbard, 2014/15

Polar Bears International $20K
Seasonal movement patterns of polar bears in James Bay and eastern Hudson Bay
M. Obbard 2013/14

Metro Toronto Zoo, Endangered Species Fund $2K
Southern Hudson Bay polar bear research
M. Obbard, 2013/14

Polar Bears International $25K
Seasonal movement patterns of polar bears in James Bay and eastern Hudson Bay
M. Obbard 2012/13

Metro Toronto Zoo, Endangered Species Fund $2K
Southern Hudson Bay polar bear research
M. Obbard, 2012/13

Metro Toronto Zoo, Endangered Species Fund $2K
Southern Hudson Bay polar bear research
M. Obbard, 2011/12

OMNR Species At Risk Branch $175K
Distance-sampling aerial survey to estimate abundance of the
Southern Hudson Bay polar bear subpopulation
M. Obbard, 2011/12

Metro Toronto Zoo, Endangered Species Fund $2K
Southern Hudson Bay polar bear research
M. Obbard, 2010/11

OMNR Minister's Climate Change Initiative $220K
Effects of climate change on the Southern Hudson Bay
polar bear population
M. Obbard, 2009/10

Metro Toronto Zoo, Endangered Species Fund $2K
Southern Hudson Bay polar bear research
M. Obbard, 2009/10

OMNR Minister's Climate Change Initiative $315K
Effects of climate change on the Southern Hudson Bay
polar bear population
M. Obbard, 2008/09

Metro Toronto Zoo, Endangered Species Fund $2K
Southern Hudson Bay polar bear research

M. Obbard, 2008/09

Canadian International Polar Year $15K
Global warming and Arctic marine mammals
A. Derocher, M. Obbard, 2008/09

OMNR Climate Change Fund $15K
Developing Physiological Indicators of Long Term Stress for Polar Bears in Southern Hudson Bay
M. Obbard, 2008/09

OMNR Minister's Climate Change Initiative $315K
Effects of climate change on the Southern Hudson Bay polar bear population
M. Obbard, 2007/08

Canadian Wildlife Federation $20K
Effects of climate change on the Southern Hudson Bay polar bear population
M. Obbard, 2007/08

World Wildlife Fund (Canada) $10K
Effects of climate change on the Southern Hudson Bay polar bear population
M. Obbard, 2007/08

U.S. Geological Survey $25K
Analysis of capture-recapture data for Southern Hudson Bay polar bear population
M. Obbard, 2007/08

Nunavut Department of Environment $30K × 3 yrs
Population abundance of the Southern Hudson Bay polar bear population
M. Obbard, 2003/04 – 2005/06

La Fondation de la faune du Québec $20K × 3 yrs
Population abundance of the Southern Hudson Bay polar bear population
M. Obbard, 2003/04 – 2005/06

Les Brasseurs du Nord $20K × 3 yrs
Population abundance of the Southern Hudson Bay polar bear population
M. Obbard, 2003/04 – 2005/06

Makivik Corporation $10K × 3 yrs
Population abundance of the Southern Hudson Bay
polar bear population
M. Obbard, 2003/04 – 2005/06

Ontario Parks $10K × 3 yrs
Population abundance of the Southern Hudson Bay
polar bear population
M. Obbard, 2003/04 – 2005/06

Safari Club International $20K × 2 yrs
Population abundance of the Southern Hudson Bay
polar bear population
M. Obbard, 2003/04 – 2004/05

OMNR Climate Change Fund $20K
Developing Physiological Indicators of Long Term Stress for Polar Bears
in Southern Hudson Bay (CC-05/06-036)
M. Obbard, 2005/06

OMNR Climate Change Fund $20K
Developing Physiological Indicators of Long Term Stress for Polar Bears
in Southern Hudson Bay (CC-04/05-002)
M. Obbard, 2004/05

Parks Canada Agency $20K
Ecology of black bears on the Bruce Peninsula
F. Burrows and M. Obbard, 2004/05

Nunavut Department of Environment $15K × 3 yrs
Developing Physiological Indicators of Long Term Stress for Polar Bears
in Southern Hudson Bay
M. Obbard, 2003/04 – 2005/06

OMNR Climate Change Fund $20K
Developing Physiological Indicators of Long Term Stress for Polar Bears
in Southern Hudson Bay (CC-03/04-010)
M. Obbard, 2003/04

OMNR Species-at-Risk Fund $15K
Polar bear maternity denning habitat, Golden Eagle nest aerial survey
M. Obbard and D. Sutherland, 2003/04

Parks Canada Agency $30K
Ecology of black bears on the Bruce Peninsula
F. Burrows and M. Obbard, 2003/04

OMNR Species-at-Risk Fund $15K
Polar bear maternity denning habitat and Golden Eagle nest aerial survey
M. Obbard and D. Sutherland, 2002/03

Parks Canada Agency $20K
Ecology of black bears on the Bruce Peninsula
F. Burrows and M. Obbard, 2002/03

World Wildlife Fund/Environment Canada Endangered Species Fund $5K
Genetic Structure of the Southern Hudson Bay polar bear population
M. Obbard, 2002/03

Parks Canada Agency $20K
Ecology of black bears on the Bruce Peninsula
F. Burrows and M. Obbard, 2001/02

OMNR Species-at-Risk Fund $30K
Polar bear maternity denning habitat aerial survey
M. Obbard, 2001/02

Parks Canada Agency $20K
Ecology of black bears on the Bruce Peninsula
F. Burrows and M. Obbard, 2000/01

Safari Club International $10K
Evaluation of suspended baits as a hunting method
to reduce harvest of adult female black bears
M. Obbard, 1998/99

EMPLOYMENT HISTORY

RESEARCH SCIENTIST—PREDATORS AND CONSERVATION BIOLOGY
Wildlife Research and Monitoring Section, Ontario Ministry of Natural Resources and Forestry, Peterborough, ON.
January 1998 to November 2016

ADJUNCT PROFESSOR
October 1999 to Present.
Watershed Ecosystems Graduate Program and Environmental and Life Sciences Graduate Program, Trent University, Peterborough, ON.

RESEARCH BIOLOGIST—PREDATORS
May 1989 to December 1997**.**
Wildlife Research Section, Ontario Ministry of Natural Resources, Maple, ON and Wildlife & Natural Heritage Science Section, Ontario Ministry of Natural Resources, Peterborough, ON.

FUR BIOLOGIST/TRAPPER EDUCATION SPECIALIST

January 1988 to May 1989.
Fur Management Unit, Wildlife Branch, Ontario Ministry of Natural Resources, Queen's Park, Toronto, ON.

BIOLOGIST/SCIENTIFIC EDITOR
December 1984 to January 1988.
Fur Management Unit, Wildlife Branch, Ontario Ministry of Natural Resources, Toronto, Ontario and Ontario Trappers Association, North Bay, ON

BIOLOGIST.
August to November 1984.
Wildlife Branch, Ontario Ministry of Natural Resources, Queen's Park, Toronto, ON.

INSTRUCTOR/LABORATORY COORDINATOR
September 1983 to May 1984.
Department of Zoology, University of Guelph, Guelph, ON.

PUBLICATIONS

THESES

Obbard, M. E. 1983. Population ecology of the common snapping turtle, Chelydra serpentina, in north-central Ontario. Ph.D. thesis, University of Guelph, Guelph, Ontario. 184pp.

____. 1977. A radio-telemetry and tagging study of activity in the common snapping turtle, Chelydra serpentina. M.Sc. thesis, University of Guelph, Guelph, Ontario. 76pp.

PEER-REVIEWED PRIMARY PUBLICATIONS

Submitted

68. Fortin, J.K., K.D. Rode, V. Sahanatien, M.E. Obbard, S. Amstrup, K. Laidre, M. Dyck, T. Atwood, J. Wilder, G. York, S. Belikov, A. Kochnev, N. Platonov, and D. Vongraven. A Delphi survey to assess the frequency and impacts of human activities on polar bears. **Arctic**, in review.

67. Viengkone, M., A.E. Derocher, E. Richardson, R.M. Malenfant, J.M. Miller, M.E. Obbard, M.G. Dyck, V. Sahanatien, N.J. Lunn, and C.S. Davis. Comparing two genetic marker systems for assessing polar bear (*Ursus maritimus*) population structure in the Hudson Bay region. **Molecular Ecology**, in review.

66. Laforest, B.J., J. Hébert, M.E. Obbard, and G.W. Thiemann. Traditional Ecological Knowledge of polar bears in the northern Eeyou Marine Region, Québec, Canada. **Arctic**, in review.

In press

65. Obbard, M.E., E.J. Newton, D. Potter, A. Orton, B.R. Patterson, and B.D. Steinberg. 2017. Big enough for bears? American black bears at heightened risk of mortality during seasonal forays outside Algonquin Provincial Park, Ontario. **Ursus**, in press.

Published

64. Pelletier, A., M.E. Obbard, M. Harnden, E.J. Howe, F. G. Burrows, B.N. White, and C.J. Kyle. 2017. Determining causes of genetic differentiation in an isolated large carnivore (Ursus americanus) population to direct contemporary conservation measures. **PLOS ONE** 12(2): e0172319.

63. Kroshko, T., L. Kapronczai, M.R.L. Cattet, B.J. Macbeth, G.B. Stenhouse, M.E. Obbard, and D.M. Janz. 2017. Comparison of methanol and isopropanol as wash solvents for determination of hair cortisol concentration in grizzly bears and polar bears. **MethodsX** 4: 68-75. http://dx.doi.org/10.1016/j.mex.2017.01.004

62. Pagano A.M., K.D. Rode, A. Cutting, M.A. Owen, S. Jensen, J.V. Ware, C.T. Robbins, G.M. Durner, T.C. Atwood, M.E. Obbard, K.R. Middel, G.W. Thiemann, and T.M. Williams. 2017. Using tri-axial accelerometers to identify wild polar bear behaviors. **Endangered Species Research** 32: 19-33.

61. Regehr, E.V., K.L. Laidre, H.R. Akçkaya, S.C. Amstrup, T.C. Atwood, N.J. Lunn, M. Obbard, H. Stern, G.W. Thiemann, and Ø Wiig. 2016. Conservation status of polar bears (*Ursus maritimus*) in relation to projected sea-ice declines. **Biology Letters** 12: 20160556.

60. Viengkone, M., A.E. Derocher, E.S. Richardson, R.M. Malenfant, J.M. Miller, M.E. Obbard, M.G. Dyck, N.J. Lunn, V. Sahanatien, and C.S. Davis. 2016. Assessing polar bear (Ursus maritimus) population structure in the Hudson Bay region using SNPs. **Ecology and Evolution** 6: 8474-8484.

59. Garshelis, D.L., Scheick, B.K., Doan-Crider, D.L., Beecham, J.J. & Obbard, M.E. 2016. *Ursus americanus*. The IUCN Red List of Threatened Species 2016: e.T41687A45034604.

58. Patterson, B.R., K.F. Mills, K.R. Middel, J.F. Benson and M.E. Obbard. 2016. Does predation influence the seasonal and diel timing of moose calving in central Ontario. **PLoS ONE** 11(4): e0150730. doi:10.1371/journal.pone.0150730

57. Obbard, M.E., M.R.L. Cattet, E.J. Howe, K.R. Middel, E.J. Newton, G.B. Kolenosky, K.F. Abraham and C.J Greenwood. 2016. Trends in body condition in polar bears (Ursus maritimus) from the Southern Hudson Bay subpopulation in relation to changes in sea ice. **Arctic Science** 2: 15-32.

56. Obbard, M.E., S. Stapleton, K.R. Middel, I. Thibault, V. Brodeur, and C. Jutras. 2015. Estimating abundance of the Southern Hudson Bay polar bear subpopulation using aerial surveys, 2011 and 2012. **Polar Biology** 38: 1713-1725.

55. Peacock, E., S.A. Sonsthagen, M.E. Obbard, A. Boltunov, E.V. Regehr, N. Ovsyanikov, J. Aars, S.N. Atkinson, G.K. Sage, A.G. Hope, E. Zeyl, L. Bachmann, D. Ehrich, K.T. Scribner, S.C. Amstrup, S. Belikov, E. Born, A.E. Derocher, I. Stirling, M.K. Taylor, Ø. Wiig, D. Paetkau, and S.L. Talbot. 2015. Correction: Implications of the circumpolar genetic structure of polar bears for their ecology, evolution and conservation in a rapidly warming Arctic. **PLoS ONE** 10(8): e0136126.

doi:10.1371/journal.pone.0136126

54. Wiig, Ø., Amstrup, S., Atwood, T., Laidre, K., Lunn, N.J., Obbard, M., Regehr, E., and Thiemann, G. 2015. *Ursus maritimus*. The IUCN Red List of Threatened Species 2015: e.T22823A14871490. doi: 10.2305/IUCN.UK.2015-4.RLTS.T22823A14871490.en.

53. Patyk, K., C. Duncan, P. Nol, C. Sonne, K. Laidre, M. Obbard; Ø. Wiig, J. Aars, E. Regehr, L.L Gustafson, and T. Atwood. 2015. Establishing a definition of polar bear (Ursus maritimus) health: a guide to research and management activities. **Science of the Total Environment** 514:371-378.

52. Peacock, E., S.A. Sonsthagen, M.E. Obbard, A. Boltunov, E.V. Regehr, N. Ovsyanikov, J. Aars, S.N. Atkinson, G.K. Sage, A.G. Hope, E. Zeyl, L. Bachmann, D. Ehrich, K.T. Scribner, S.C. Amstrup, S. Belikov, E. Born, A.E. Derocher, I. Stirling, M.K. Taylor, Ø. Wiig, D. Paetkau, and S.L. Talbot. 2015. Implications of the circumpolar genetic structure of polar bears for their ecology, evolution and conservation in a rapidly warming Arctic. **PLoS ONE** 10(1): e112021. doi:10.1371/journal.pone.0112021

51. Obbard, M.E., E.J. Howe, L.L. Wall, B. Allison, R. Black, P. Davis, L. Dix-Gibson, M. Gatt, and M.N. Hall. 2014. Relationships among food availability, harvest, and human—bear conflict at landscape scales in Ontario. **Ursus** 25(2):98-110.

50. Crompton, A.E., M.E. Obbard, S.D. Petersen, and P.J. Wilson. 2014. Corrigendum to "Population genetic structure in polar bears (*Ursus maritimus*) from Hudson Bay, Canada: Implications for future climate change" [Biol. Conserv. 141(10) (2008) 2528-2539]. **Biological Conservation** 179: 152.

49. Burke, P.S., J.D. McCracken, C.D. Jones, M.E. Obbard, D.A. Sutherland, and R. Ridout. 2013. First documented nests of Hoary Redpoll in Ontario. **Ontario Birds** 31(3): 122-135.

48. Howe, E.J., M.E. Obbard, and C.J. Kyle. 2013. Combining data from 43 standardized surveys to estimate densities of female American black bears by spatially explicit capture–recapture. **Population Ecology** 55(4): 595-607.

47. Romain, D.A., M.E. Obbard, and J.L. Atkinson. 2013. Food habits of the American black bear (*Ursus americanus*) in the boreal forest of northern Ontario. **Canadian Field-Naturalist** 127(2): 118-130.

46. Patterson, B.R., J.F. Benson, K. Middel, K. Mills, A. Silver, and M.E. Obbard. 2013. Moose calf mortality in central Ontario, Canada. **Journal of Wildlife Management** 77: 832-841.

45. Derocher, A.E., J. Aars, S.C. Amstrup, A. Cutting, N.J. Lunn, P.K. Molnár, M.E. Obbard, I. Stirling, G.W. Thiemann, D. Vongraven, Ø. Wiig, and G. York. 2013. Rapid ecosystem change and polar bear conservation. **Conservation Letters** 6(5): 368-375.

44. Dietz, R., Sonne, C., Basu, N., Braune, B., O'Hara, T., Letcher, R.J., Scheuhammer, T., Andersen, M., Andreasen, C., Andriashek, D., Asmund, G., Aubail, A., Baag++e, H., Born, E.W., Chan, H.M., Derocher, A.E., Grandjean, P., Knott, K., Kirkegaard, M., Krey, A., Lunn, N., Messier, F., Obbard, M., Olsen, M.T., Ostertag, S., Peacock, E., Renzoni, A., Rig+_t, F.F., Skaare, J.U., Stern, G., Stirling, I., Taylor, M., Wiig, Ø., Wilson, S., and Aars, J. 2013. What are the toxicological effects of mercury in

Arctic biota? **Science of The Total Environment** 443:775-790.

43. Vongraven, D., J. Aars, S. Amstrup, S. N. Atkinson, S. Belikov, E.W. Born, T. D. DeBruyn, A.E. Derocher, G. Durner, M. Gill, N. Lunn, M.E. Obbard, J. Omelak, N. Ovsyanikov, E. Peacock, E. Richardson, V. Sahanatien, I. Stirling, and Ø. Wiig. 2012. A circumpolar monitoring framework for polar bears. **Ursus Monograph Series** 5:1-66.

42. Obbard, M.E. and K.R. Middel. 2012. Bounding the Southern Hudson Bay polar bear subpopulation. **Ursus** 23(2): 134-144.

41. Macbeth, B.J., M.R.L. Cattet, M.E. Obbard, K. Middel and D.M. Janz. 2012. Evaluation of hair cortisol concentration as an indicator of long-term stress in free-ranging polar bears. **Wildlife Society Bulletin** 36(4):747-758.

40. Pelletier, A., M.E. Obbard, K. Mills, E.J. Howe, F.G. Burrows, B.N. White, and C. J. Kyle. 2012. Delineating genetic groupings in continuously distributed species across undisturbed landscapes: a study of American black bears (*Ursus americanus*) in Ontario, Canada**. Canadian Journal of Zoology** 90:999-1014.

39. Miller, W., S.C. Schuster, A.J. Welch, A. Ratan, O.C. Bedoya-Reina, F. Zhao, H.L. Kim, R.C. Burhans, D.I. Drautz, N.E. Wittekindt, L.P. Tomsho, E. Ibarra-Laclette, L. Herrera-Estrella, E. Peacock, S. Farley, G.K. Sage, K. Rode, M. Obbard, R. Montiel, L. Bachmann, Ó. Ingólfsson, J. Aars, T. Mailund, Ø. Wiig, S.L. Talbot, and C. Lindqvist. 2012. Polar and brown bear genomes reveal ancient admixture and demographic footprints of past climate change. **Proceedings of the National Academy of Sciences** doi/10.1073/pnas.1210506109

38. Wirsing, A.J., J.R. Phillips, M.E. Obbard, and D.L. Murray. 2012. Incidental nest predation in freshwater turtles: inter- and intraspecific differences in vulnerability are explained by relative crypsis. **Oecologia** 168(4):977-988.

37. Howe, E.J., M.E. Obbard, and J. Bowman. 2012. Prior reproduction and weather affect berry crops in central Ontario. **Population Ecology** 54:347-356.

36. Thiemann, G.W., S.J. Iverson, I. Stirling, and M.E. Obbard. 2011. Individual patterns of prey selection and dietary specialization in an Arctic marine carnivore. **Oikos** 120 (10): 1469-1478.

35. Pelletier, A., C. Doyle, B. White, M.E. Obbard, and C.J. Kyle. 2011. Small-scale genetic structure of American black bears illustrates potential postglacial recolonization routes. **Journal of Mammalogy** 92(3): 629-644.

34. Chow, B.A., J. Hamilton, M.R.L. Cattet, G. Stenhouse, M.E. Obbard, and M.M. Vijayan. 2011. Serum corticosteroid binding globulin expression is modulated by fasting in polar bears (*Ursus maritimus*). **Comparative Biochemistry and Physiology A:** 158 (1): 111-115.

33. Obbard, M.E., M.B. Coady, B.A. Pond, J.A. Schaefer and F.G. Burrows. 2010. A distance-based analysis of habitat selection by black bears (*Ursus americanus)* on the Bruce Peninsula, Ontario, Canada. **Canadian Journal of Zoology** 88 (11): 1063-1076.

32. Howe, E.J., M.E. Obbard, R. Black and L. Wall. 2010. Do public complaints reflect trends in human-bear conflict? **Ursus** 21 (2): 131-142.

31. Maxie, A.J., K.F. Hussey, S.J. Lowe, K.R. Middel, B.A. Pond, M.E. Obbard, and B.R. Patterson. 2010. A comparison of forest resource inventory, provincial land cover maps and field surveys for wildlife habitat analysis in the Great Lakes-St. Lawrence Forest. **Forestry Chronicle** 86 (1):77-86.

30. Cattet, M.R.L. and M.E. Obbard. 2010. Use of hyaluronidase to improve chemical immobilization of free-ranging polar bears (*Ursus maritimus*). **Journal of Wildlife Diseases** 46 (1):246-250.

29. Obbard, M.E., E.J. Howe, and C.J. Kyle. 2010. Empirical comparison of density estimators for large carnivores. **Journal of Applied Ecology** 47 (1):76-84.

28. Molnár, P.K., T. Klanjscek, A.E. Derocher, M.E. Obbard, and M.A. Lewis. 2009. Estimating energy stores and metabolic rate of a polar bear from body mass and body length. **Journal of Experimental Biology** 212:2313-2323.

27. Obbard, M.E., B.A. Pond, A. Schenk, R. Black, M.N. Hall, and B. Jackson. 2008. Suspended baits: can they help hunters distinguish male from female American black bears? **Ursus** 19:33-42.

26. Obbard, M.E. and E.J. Howe. 2008. Demography of black bears in hunted and unhunted areas of the boreal forest of Ontario. **Journal of Wildlife Management** 72:869-880.

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