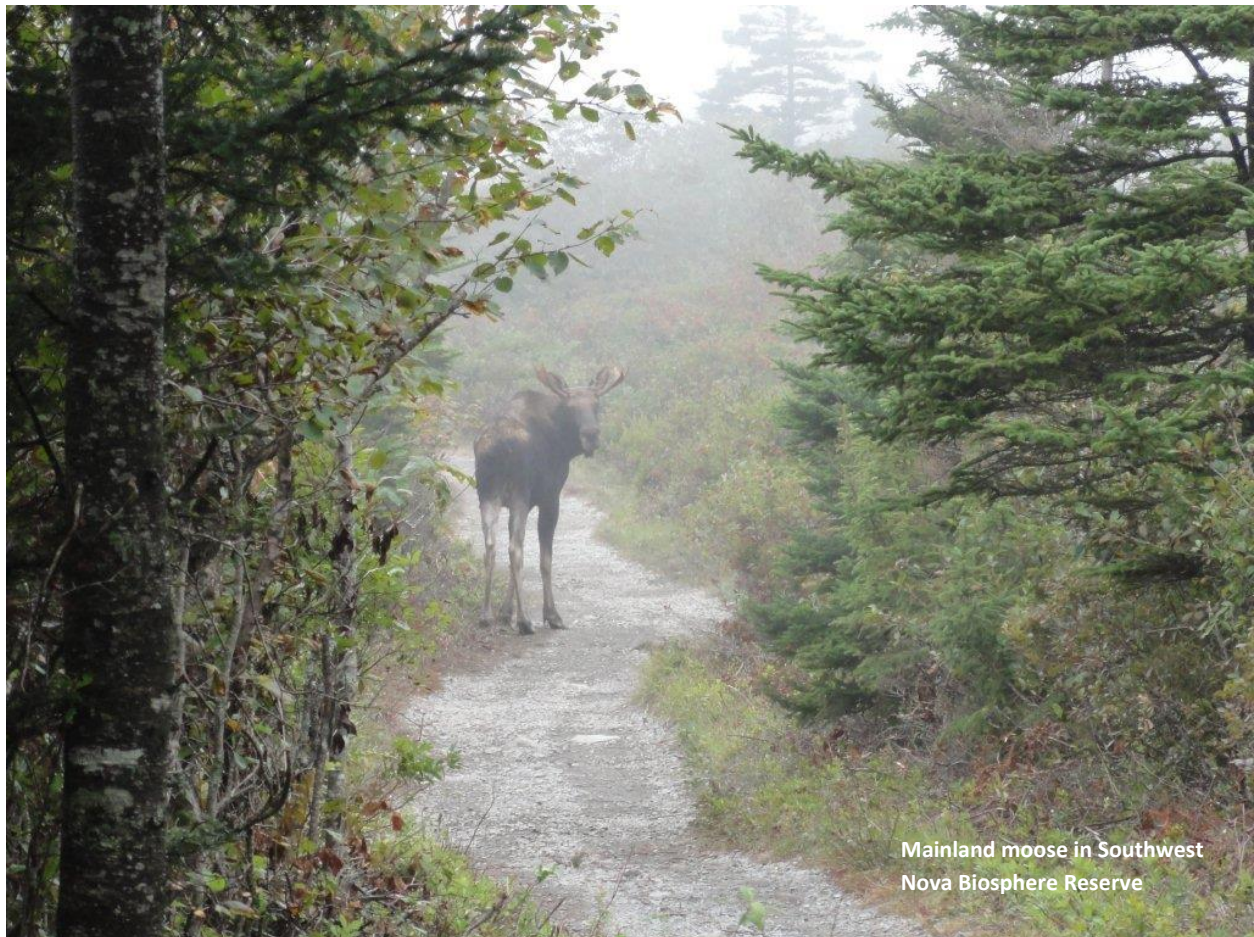


GUTTED

Endangered Mainland Moose and How the Government of Nova Scotia Makes a Mockery of UNESCO



Unless someone like you cares a whole awful lot, nothing is going to get better. It's not.

[Dr. Seuss – The Lorax, 1971, quoted by The Honourable Justice Christa M. Brothers of the Supreme Court of Nova Scotia in her ruling (29 May 2020) against the Nova Scotia Minister of Lands and Forestry and The Attorney General of Nova Scotia Representing Her Majesty the Queen in Right of the Province of Nova Scotia with respect to their failures in implementation of the Nova Scotia Endangered Species Act, and with specific reference to the endangered mainland moose.]

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updated document will be issued accordingly.

Media and Other Inquiries

Nina Newington: 902.698.4347

Doug Hickman: 902.582.3736

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Healthy Forest Coalition, Nova Scotia

Ecology Action Centre

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Orientation to Nova Scotia



Nova Scotia is a Province of Canada. It is located in the east of the country. The province has an area of 55,284 km² and a population of 925,000 people (2016).

Governance institutions in Canada include the federal government and the governments of each province and territory; many governance responsibilities are shared between the federal government and provinces/territories. International agreements signed by the Government of Canada may require the participation of provinces/territories to implement; levels of support may vary across the country with respect to such agreements. Treaties govern many aspects of governance between Aboriginal peoples and federal, provincial and territorial governments.

1. The United Nations Educational, Scientific and Cultural Organization (UNESCO) and World Biosphere Reserves

UNESCO is a “specialized agency” of the United Nations with a mandate to “build peace through international cooperation in Education, the Sciences and Culture”¹. Canada is one of the 193 States that participate in UNESCO². UNESCO is financed by contributions from its members; in 2020 Canada has contributed \$11.8 million to the organization, equivalent to approximately 3.5 percent of the agency’s “Regular Budget”³.

Among its activities, UNESCO created the *Man and the Biosphere Program* in 1971 with the overall purpose of establishing a scientific basis for enhancing the relationship between people and their environments. The establishment of a “World Network of Biosphere Reserves” has been a core component of the Program since it was established. As of 2019, there were 714 World Biosphere Reserves in 129 countries including 18 in Canada, one of which is the Southwest Nova Biosphere Reserve.

World Biosphere Reserves are subject to *Statutory Framework of the World Network of Biosphere Reserves*, the legal document that not only governs UNESCO activities with respect to World Biosphere Reserves but which also sets out criteria for establishing a World Biosphere Reserve and the key elements that must be observed in the management of the Reserve⁴. Among other items, the document sets out that World Biosphere Reserves:

- Constitute a tool for the conservation of biological diversity and the sustainable use of its components, thus contributing to the objectives of the Convention on Biological Diversity and other pertinent conventions and instruments.
- Must include “appropriate zonation”, recognizing:
 - “A legally constituted core area or areas devoted to long-term protection, according to the conservation objectives of the biosphere reserve, and of sufficient size to meet these objectives”;
 - “A buffer zone or zones clearly identified and surrounding or contiguous to the core area or areas, where only activities compatible with the conservation objectives can take place”;
 - “An outer transition area where sustainable resource management practices are promoted and developed”.
- Are fully under the jurisdiction in which the Reserves are located.

2. Mainland Moose in Nova Scotia

Moose range in North America extends throughout boreal and mixed forests from Newfoundland to Alaska. The total range of moose, however, is comprised of four sub-species, of which only one (Eastern

¹ <https://en.unesco.org/about-us/introducing-unesco>

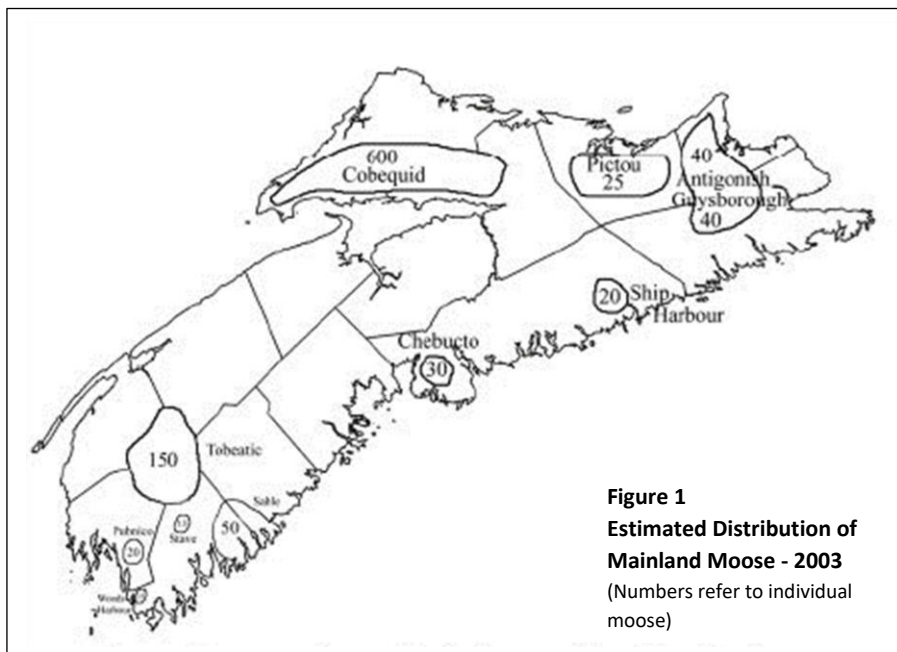
² States may participate in the United Nations system but may choose not to participate in UNESCO.

³ <http://www.unesco.org/new/en/member-states/mscontent/assessed-contributions/>. States may contribute additional amounts to support specific programs; Canada has contributed \$120,000 to support the World Cultural and Natural Heritage program of UNESCO.

⁴ <https://en.unesco.org/mab/strategy>

Moose, *Alces alces americana*) occurs in mainland Nova Scotia⁵, and which in Nova Scotia is referred to as simply “mainland moose”.

The mainland moose population in Nova Scotia has been estimated to have been in the order of 15,000 animals at the time of European colonization in 1604. Prior to this time the mainland moose had been sustainably hunted since the arrival in what is now Nova Scotia by the Mi'kmaq people several thousands of years earlier. By the mid-1800's, however, the number of mainland moose was widely understood to have declined greatly as a result of over-hunting by the (mostly) European population following its arrival in 1604. Restrictions on non-native hunting of mainland moose were put in place by the provincial government in 1875, and this was extended to a full ban on non-native hunting in 1937. In 2003 it was estimated that the population of mainland moose was 1,000 – 1,200. Figure 1 shows the approximate distribution of the main concentrations of mainland moose at that time; additional mainland moose were estimated to be scattered across the province, and particularly in eastern and northeastern Nova Scotia⁶.



Current moose numbers are unknown. The Government of Nova Scotia retained an independent expert to conduct limited aerial surveys of mainland moose populations in the winters of 2017 and 2018, which estimated a total of 61 individual moose in a total area of over 4,449 km² of the eastern and northern mainland. Based on the data, the expert concluded that the total moose population had continued to decline, although he cautioned that the limited survey he was able to undertake precluded an exact

⁵ All moose in Cape Breton Island (Nova Scotia) are descended from the genetically different Western Moose (*Alces alces andersonii*), introduced to the island in 1947/48 (<https://www.pc.gc.ca/en/pn-np/ns/cbreton/decouvririr-discover/faune-animals/mammiferes-mammals/original-moose>).

⁶ Moose data and map from Parker, G., 2003: Status Report on The Eastern Moose (*Alces alces americana* Clinton) in Mainland Nova Scotia

estimate. Nevertheless, he concluded that *“It is safe to say that if you were to double or triple the moose density set forth in this survey, there remains a paucity of moose on the mainland”*⁷.

Various reasons are cited for the decline in numbers of mainland moose in Nova Scotia:

- Parasitic disease. Researchers have identified that mainland moose are parasitized by, particularly, *Parelaphostrongylus tenuis*, commonly referred to as brainworm. The neurological effects of this parasite in moose result in the loss of use of limbs and resulting emaciation and/or predation by carnivores⁸.
- Biologists and naturalists have identified that industrial forestry is incompatible with the needs of moose⁹:
 - Moose need mixed hardwood-softwood stands with at least 25 per cent hardwoods, and these should be spread at landscape scale.
 - Moose are highly dependent on mature, 100-plus-year-old forests for shelter from summer heat and cold winter winds, with a scattering of younger forest patches for food.
 - The sprouts/suckers growing from stumps in clearcuts offer little nutrition for moose. Moose tend to avoid clearcuts until 15-25 years of regeneration exists on the site.
 - Moose avoid areas where road densities (including forest access and logging roads) reach 0.6 km per square kilometre, even if good habitat is available.
- Poaching may still continue.
- Natural and/or man-made processes (e.g. acid precipitation) may result in chemical imbalances in moose diets (e.g. as a result of elevated levels of metals in vegetation) and changes in the types of forest cover that are available (e.g. as a result of forest pests that kill mature trees that provide necessary cover); eastern hemlock, white ash and black ash are currently seriously threatened.

Key requirements for re-building the populations of mainland moose have been summarized in the Proceedings of the Nova Scotian Institute of Science to include, in addition to other actions that may be necessary, *“food and cover in sufficient quantity and of appropriate interspersion to meet their daily and seasonal needs. Mature forest with a well developed understory, and open areas with early successional vegetation provide forage, while dense forest provides cover from thermal stress and deep snow. Strategies for moose conservation, such as through forest management, should concentrate on the preservation and enhancement of habitat to meet the critical requirements of viable moose populations and the re-establishment of connections among discrete populations”*¹⁰.

⁷ Data in this paragraph are taken from: McGregor, P., 24 May 2019: *From high overhead, a sobering look at a moose population in deep trouble*, CBC News Investigates (<https://www.cbc.ca/news/canada/nova-scotia/mainland-moose-nova-scotia-decline-1.5148572>)

⁸ <http://blog.healthywildlife.ca/cases-of-brain-worm-in-endangered-mainland-moose-in-nova-scotia/#:~:text=Cases%20of%20Brain%20Worm%20in%20Endangered%20Mainland%20Moose%20in%20Nova%20Scotia,-by%20CWHC%20C2%B7%202013&text=The%20disease%20this%20parasite%20causes,cause%20disease%20in%20this%20species.>

⁹ Bancroft, B., 3 November 2020: *Clearcuts squeeze out beleaguered mainland moose*, Chronicle-Herald, Halifax; <https://www.thechronicleherald.ca/opinion/local-perspectives/bob-bancroft-clearcuts-squeeze-out-beleaguered-mainland-moose-516475/>

¹⁰ Snaith, T.V., and Beazley, K.F, 2004: *Proceedings of the Nova Scotian Institute of Science* Vol. 42 Part 2: 263-317.

3. Cultural Context of Mainland Moose

The mainland moose is the largest terrestrial animal in Nova Scotia and holds an iconic position in the culture of both First Nations (Mi'kmaq) and the subsequent (largely) European immigrant community.

The mainland moose has had a centrally important place in Mi'kmaq culture in Nova Scotia for thousands of years. The following paragraphs illustrate this importance and are excerpted from documentation prepared by Margaret Robinson, a Mi'kmaq researcher and author based in Halifax, Nova Scotia¹¹.

“Due to his immensely large size (an adult moose is 1.5-2 metres high at the shoulder), the moose is considered the chief of all land animals, and is a counterpart to the whale, who is king of the ocean. Traditionally, the killing of a moose was a significant event, and served as a young man's entry into adulthood by signaling that he possessed the skills to support a family and the patience and maturity to participate in political councils.”

“Mi'kmaq hunters are expected to show respect for the hunted moose through traditional ceremony: Once [the Moose has been] killed, the traditional harvester lays a circle of tobacco around the moose and says a prayer in gratitude for the earth's offering. The bell or dewlap (the loose skin that hangs on the lower jaw) is removed and hung in a tree as a sign to other animals that the moose was harvested in a sacred way. A pipe ceremony is initiated by the harvester to help release the animal's spirit, to ask forgiveness for taking its life, and to let it know that the gift of its life is appreciated. The ceremonial interaction with animal spirits is seen as a continuation of our interaction with embodied animals. To fail to show respect to an animal spirit risks future food security, since animal spirits are believed to reincarnate (increasing the animal population) and to communicate with others of their kind, reporting on how we have treated them in life and death.”

“The Confederacy of Mainland Mi'kmaq, a council of seven Mi'kmaq communities on mainland Nova Scotia, notes the continuing importance of following protocols of respect: Some animals, like moose, give their lives so the Mi'kmaq may have food. They show respect to the moose by treating the remains with respect. The bones of the moose should never be burned or given to household pets, they should be used to make something or buried.”

“While the right of the Mi'kmaq to hunt animals such as the moose is protected in treaties signed with the Crown¹², Mi'kmaq guidelines forbid moose hunting on Mainland Nova Scotia due to its endangered status.”

Following their arrival in Nova Scotia, Europeans and other immigrants and their descendants have hunted mainland moose extensively until hunting of mainland moose was banned in 1937. More generally, the moose has been an iconic image of the Nova Scotia wilderness and forest since the late

¹¹ Robinson, Margaret. (2016). Is the Moose Still My Brother if We Don't Eat Him?. In *Critical Perspectives on Veganism*; https://www.researchgate.net/publication/308081867_Is_the_Moose_Still_My_Brother_if_We_Don't_Eat_Him

¹² The effect of the treaties is that the rights established for First Nations in Nova Scotia (i.e. Mi'kmaq people) take precedence over the legal acts of the federal parliament and the provincial legislature.

19th century and earlier, when it was used for marketing and other purposes. The moose has been a recurring theme in Nova Scotia art and literature. Numerous geographic features (e.g. rivers, islands etc.) include “moose” in their name.

4. Actions Taken To Address Declining Populations of Mainland Moose in Nova Scotia

The mainland moose in Nova Scotia was designated an “endangered species” in 2003 under the provisions of the provincial Endangered Species Act of 1998 (Chapt. 11 of the Acts of 1998)¹³. The Act requires that the Minister take actions specified in the Act to provide for the recovery species that are designated as “endangered” under the Act¹⁴. In particular, the Act requires that the Minister:

- Within 1 year of listing a species as “endangered”, appoint a recovery team and prepare a recovery plan for the species.
- Within the recovery plan, identify areas to be considered for designation as core habitat.
- Review the recovery plan every 5 years.

The central focus of measures to achieve the recovery of mainland moose in Nova Scotia – and including within the area defined as the Southwest Nova Biosphere Reserve – are therefore the measures specified in accordance with the Endangered Species Act.

Two reports and a case brought before the Supreme Court of Nova Scotia in recent years document that the Government of Nova Scotia has been unable and/or unwilling to implement the Endangered Species Act with respect to mainland moose for at least the past decade, and have questioned the competence of the provincial Department of Lands and Forests in this regard:

1. **Report of the Auditor General: Department of Natural Resources, 2016**¹⁵ The Auditor General reviewed the species at risk activities of the Department of Natural Resources¹⁶. The report identified a litany of substantive and administrative failures with respect to the implementation by the Department of the Endangered Species Act, and including with respect to mainland moose. In particular, the report highlighted that preservation of habitat for species at risk is important to their survival and that protection of habitat goes beyond protection of endangered species individually to that of their supporting ecosystems.
2. **Independent Review of Forest Practices in Nova Scotia, 2018**¹⁷ This report was prepared for the Minister of Natural Resources (later renamed Lands and Forestry) and explicitly states that the paradigm of timber production for commercial values must be replaced by forestry in which

¹³ This document focuses on mainland moose in the Southwest Nova Biosphere. However, it is noted that 71 species of fauna and flora are included onto the List of Species at Risk under the provincial Endangered Species Act (S.N.S. 1998, c. 11, N.S. Reg. 146/2017 (April 12, 2017), of which 8 are already extinct or extirpated from Nova Scotia. Very many of the remaining species are also present in the Southwest Nova Biosphere.

¹⁴ Implementation of the Act is delegated to Minister responsible for Lands and Forestry. Accordingly, the Minister and Department of Lands and Forestry are responsible for the implementation of the Act.

¹⁵ https://oag-n.s.ca/sites/default/files/publications/Chapter%203_0.pdf

¹⁶ In 2018 the name of the Department of Natural Resources was changed to Department of Lands and Forestry

¹⁷ https://novascotia.ca/natr/forestry/forest_review/Lahey_FP_Review_Report_ExecSummary.pdf

environmental, social, and economic values should be balanced by using forest practices that give priority to protecting and enhancing ecosystems and biodiversity. Specific recommendations are included that the Minister “ensure as an immediate priority....the protection of core habitat for species at risk [including mainland moose] located on Crown lands”. The report also notes (Executive Summary Conclusions paragraph 55) a likelihood that the Department may wish to appear to be working towards a new ecological approach to forestry while in fact delaying the changes called for in the report, including the provision of core habitat for mainland moose (and other endangered species) in the Southwest Nova Biosphere Reserve and elsewhere.

3. **The Supreme Court of Nova Scotia**¹⁸. On 29 May 2020, the Honourable Justice Christa M. Brothers (Supreme Court of Nova Scotia) ruled on a case brought against the Minister of Lands and Forestry and the Attorney General of Nova Scotia that the Minister had failed in his obligations under the Endangered Species Act to provide for the recovery of mainland moose (and other specified species registered under the Act). The Court stated that “the Minister has exhibited a chronic and systemic failure to implement action required under the ESA” (Endangered Species Act). With respect to mainland moose specifically, the Court:
 - Determined that a recovery team was appointed in 2004 and a recovery plan was prepared in 2007, but not approved until 2012. The subsequent review of the recovery plan was 1 year late.
 - Found that the recovery plan does not identify areas to be considered as core habitat, in contravention of the Act.
 - Questioned why comprehensive data around mainland moose populations have not been generated.
 - Noted that “It appears that the Department is implementing actions based on a 12-year-old plan with 16-year-old population data”.

The Court has ordered that the Minister must uphold the requirements of the Endangered Species Act, including with respect to mainland moose. In particular, the Court has affirmed that the Minister must ensure the recovery plan for the Mainland Moose is properly reviewed and revised, and must identify core habitat to support the recovery of mainland moose.

5. Mainland Moose and Core Habitat in Southwest Nova Biosphere Reserve

Mainland moose in the Southwest Nova Biosphere Reserve survive in low and declining numbers in the habitat that is available to them. The Supreme Court of Nova Scotia, the Auditor-General of Nova Scotia, the forestry review that has reported to the Minister of Lands and Forestry of Nova Scotia, and biologists and field naturalists with provincial standing and recognition have all stated that “core habitat” is key to the recovery of mainland moose in Nova Scotia. The evidence of declining mainland moose populations within the area of the Southwest Nova Biosphere Reserve since its establishment clearly indicates that either the maintenance of the status-quo or a decline in the area and/or quality of

¹⁸ <https://decisia.lexum.com/nsc/nssc/en/item/479814/index.do?fbclid=IwAR25bEZK7-eXCPFrPtY6wrZPPVNZcbYY4HqCR8waGqwbaceddfXinv7o6TQ>

mainland moose habitat will result in the extirpation of the species from the Reserve¹⁹. Accordingly, it is clear that:

1. The requirement for additional high-quality core habitat is a foundational requirement for the recovery of mainland moose populations in the Southwest Nova Biosphere Reserve (and elsewhere in the province).
2. The amount of additional high quality core habitat that is necessary must be established in accordance with the requirements for a naturally sustaining moose population and the quality of this habitat must be in accordance with what has been defined by science: mature (preferably 100-plus-year-old) mixed hardwood-softwood stands that will provide shelter from summer heat and cold winter winds with a scattering of younger forest patches for food.

Figure 2 presents the area that is registered as the Southwest Nova Biosphere Reserve, and the zoning within the Reserve based on (but not compliant with) UNESCO requirements:

- The “core area” is the combined area of Kejimikujik National Park and National Historic Site and the adjoining the Tobeatic Wilderness Area.
- The “buffer zone” referred to the UNESCO legislation is referred to in the zoning map in Figure 2 as “Sustainable Resource Management and Protection Zone (Buffering)”. The largest single component of this zone are the Crown lands (number 29), for which there are no legal limitations regarding economic or other activities. The language used on the zoning map to describe this zone indicates that in fact this zone does not comply with the legal requirement of UNESCO that a buffer zone is required (not a “sustainable resource management and protection zone) where “only activities compatible with the conservation objectives can take place”.
- A “cooperation (transition) zone”.

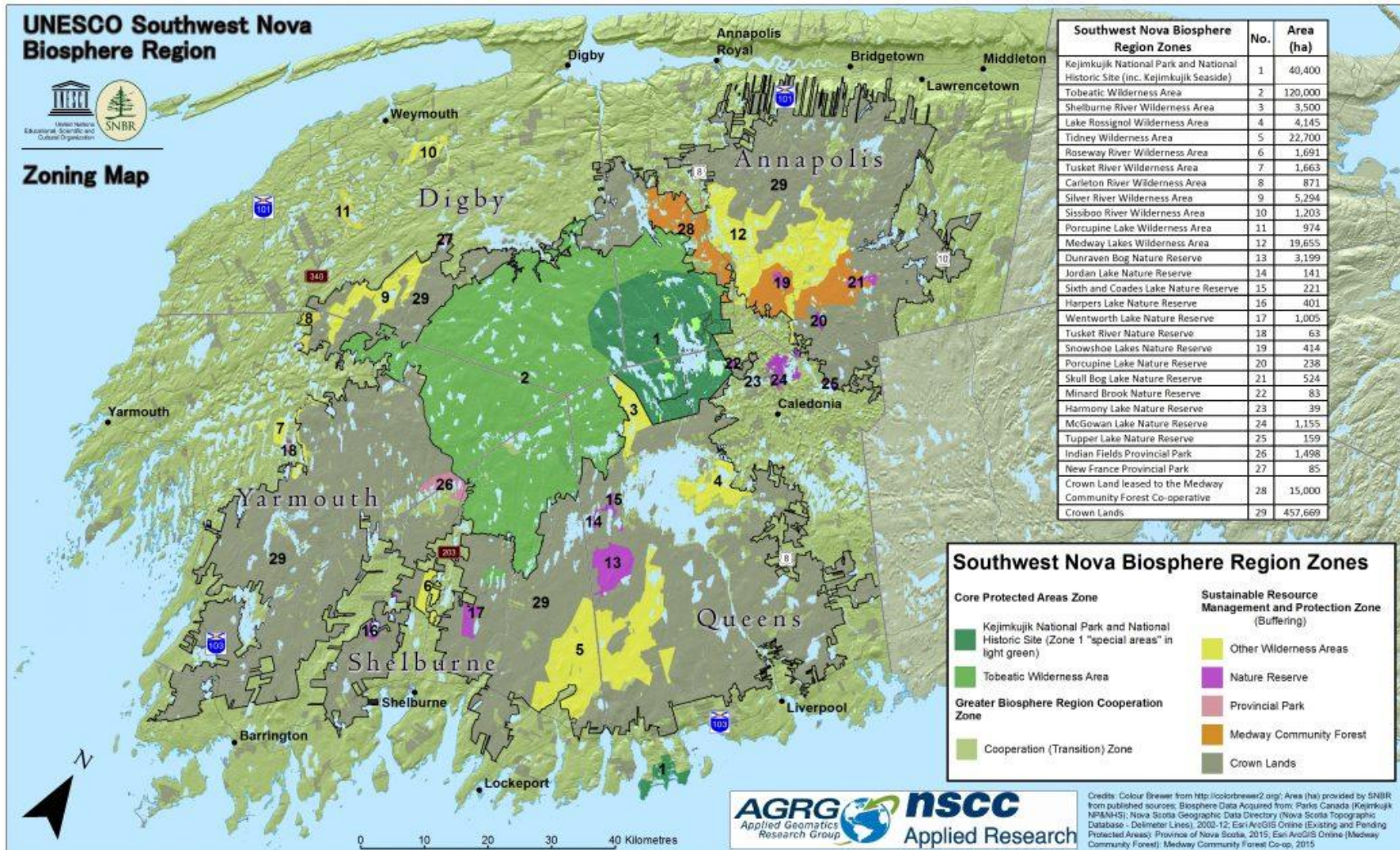
With the exception of the narrow lowland valley that extends from Annapolis Royal to Middleton and beyond, over 90 percent of the mapped area in Figure 2 is forest. Land that is shown as “Transition (Cooperation) Zone” is privately owned or is under municipal ownership. Kejimikujik National Park and National Historic Site (identified as Number 1 in Figure 2) is under the ownership and jurisdiction of the federal government. All other lands (and including all lands that are numbered from 2-29) are under the ownership and direct jurisdiction of the Province of Nova Scotia.

Historically, mainland moose ranged throughout the area that now defines the Southwest Nova Biosphere Reserve. As shown in Figure 1, by 2003 moose populations were concentrated in specific locations, and particularly in the area of Kejimikujik National Park and National Historic Site and the Tobeatic Wilderness Area (numbers 1 and 2 on Figure 2); federal and provincial law provides for access to these areas by people, but generally provides full protection to all biodiversity within these area and places restrictions on the types of activity that may be undertaken²⁰. Accordingly, the “core area” of

¹⁹ By extension, it is clear that this holds true for the Province as a whole.

²⁰ First Nations people may undertake activities in accordance with Treaty, and these may vary as compared to activities that may be undertaken by non-First Nations people.

Figure 2:
Zoning Map of Southwest Nova Biosphere Reserve



Kejimikujik National Park and National Historic Site and the Tobeatic Wilderness Area is *de facto* also “core habitat” for the existing mainland moose population.

As shown in Figure 2, this “core area” is substantially surrounded by Crown land (number 29 in Figure 2) – i.e. land under the ownership of the Canadian Crown and administered for public benefit by (in this case) the Province of Nova Scotia. This land is entirely forested; decisions regarding the use of this land are made directly by the Province of Nova Scotia through the Minister and Department of Lands and Forestry.

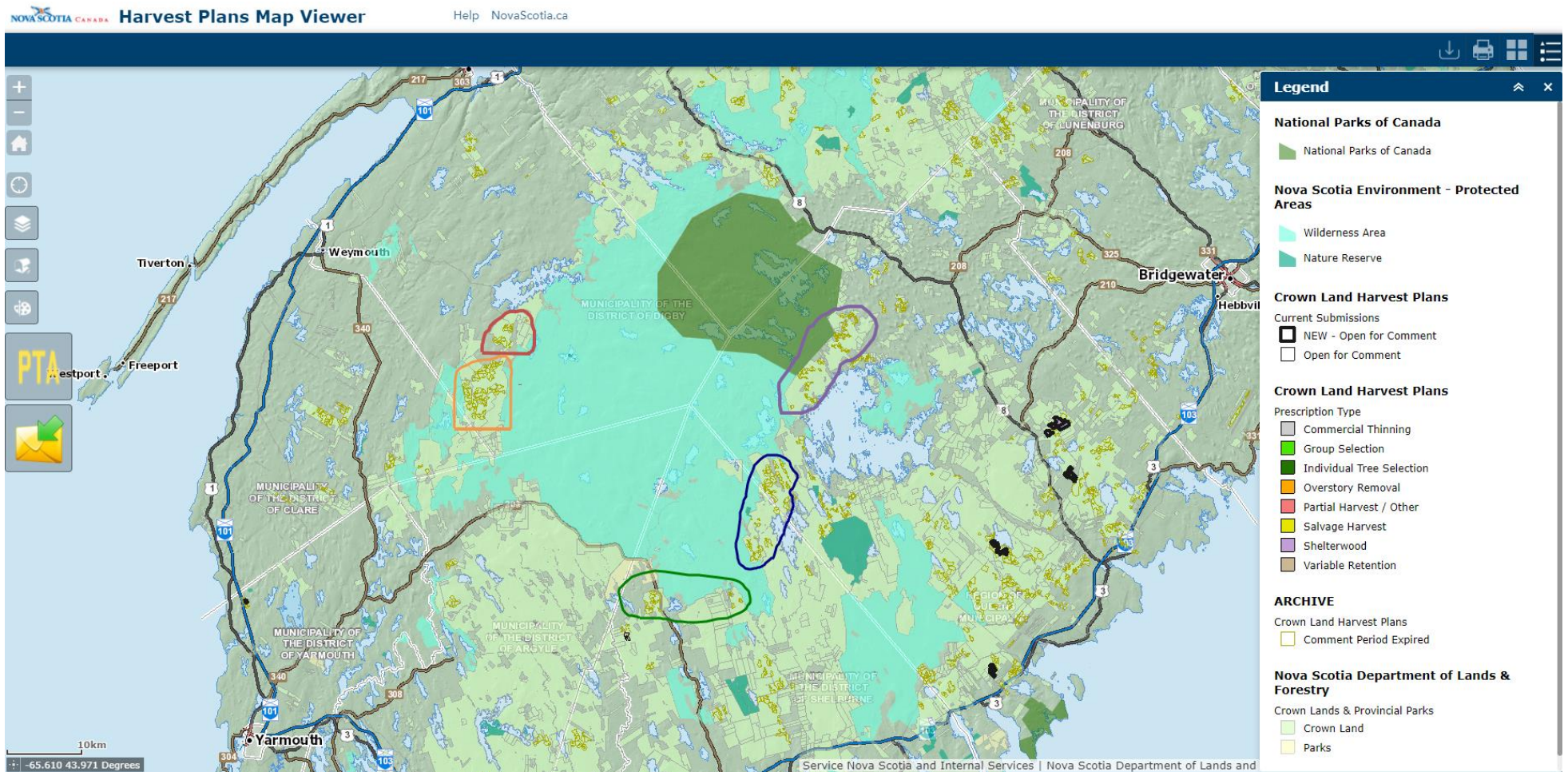
The Crown lands that surround the “Core Protected Zone” can also be “core habitat” for the recovery of a naturally sustainable mainland moose population if the lands are managed in accordance with UNESCO criteria for a “buffer zone” (i.e. in ways compatible with conservation objectives). The most critical areas of these lands for this purpose are the areas adjacent to the existing “core area” of Kejimikujik National Park and National Historic Site and Tobeatic Wilderness Area because these adjacent areas have the potential to provide an immediate and unbroken extension of habitat for mainland moose beyond the “core area”. The importance of these lands to recovery of mainland moose populations in the Southwest Nova Biosphere Reserve is indicated by periodic (if only occasional) reports of moose, or signs of moose (e.g. scat), by local residents and visitors to these Crown lands. It is evident that individual moose may enter Crown land at any time from core populations that may primarily reside in the “core area”, and that individual moose may anyway reside primarily on suitable Crown land that falls within their historic range. It is equally evident that the Crown lands require management in accordance with the needs of moose if the ability of these lands to sustain moose populations is to be optimized.

The primary economic activity on the Crown lands shown in Figure 2 is forestry. The Department of Lands and Forestry uses the tool “Harvest Plans Map Viewer” to publish its planned forest cutting and removal activities. Figure 3 presents the planned cutting and removal activity adjacent to the “core area” of Kejimikujik National Park and National Historic Site and the Tobeatic Wilderness Area in mid-November 2020²¹; forest removal that is planned most immediately adjacent to the “core area” is shown in the coloured circles. In total, forest removal that is planned to be undertaken imminently (and which has already commenced in some cases) within the coloured circles shown on Figure 3 comprises 2,914 ha of Crown lands, an area equivalent to 7 percent of Kejimikujik National Park and National Historic Site²². The specific forestry activities are summarized in Table 1, below.

²¹ The Harvest Plans Viewer is the tool used by Nova Scotia Department of Lands and Forestry to publicly identify its plans for forest removal on Crown land.

²² By way of indicative comparison, Elk Island National Park in Alberta has an area of 19,400 ha and supports approx. 300 moose (<https://open.canada.ca/data/en/dataset/228bc045-45e2-4a48-b07a-3f31777ffb7b>). Indicatively, this suggests that the 2,914 ha that is subject to forest cutting adjacent to Kejimikujik and the Tobeatic might support up to 45 moose if it was properly managed; separately, Chris McCarthy (Ecologist, Kejimikujik National Park and National Historic Site, suggests that 1 moose/km² may be a maximum desirable population density [personal communication, 16 November 2020]). However, the disjointed pattern of these forestry plots and their variable access to water means that the actual number of moose that might be supported on this specific land base would be many fewer.

Figure 3:
Forestry Management Plans in Central Southwest Nova Biosphere Reserve



Notes:

1. This map is current on 15 November 2020
2. Planned cutting activity is identified by the irregular yellow patches on the map. The planned cutting activity within the red, orange, green, blue and purple lines is the planned cutting activity that is most adjacent to Kejimikujik National Park and Historic Site (shown in dark green) and the Tobeatic Wilderness Area (shown in light green); the planned cutting activity in these areas is summarized in Table 3.

Source: Online mapping at <https://nsgi.novascotia.ca/hpmv/>

Table 1
Planned Forest Removal Immediately Adjacent to Kejimikujik National Park and Tobeatic Wilderness Area (Ha)

| Overstorey Removal | Seed Tree Harvest | Salvage | Variable Retention (%) | | | Shelterwood | Individual Tree Selection | Systemic Patch | Partial Harvest/Other |
|--------------------|-------------------|---------|------------------------|--------|--------|-------------|---------------------------|----------------|-----------------------|
| | | | 10 | 20 | 30 | | | | |
| 1198.53 | 17.93 | 190.12 | 128.54 | 235.38 | 253.14 | 352.85 | 414.57 | 20.44 | 102.8 |

Note: “Variable retention” at levels of 10 percent, 20 percent and 30 percent equate to removal of 90 percent, 80 percent and 70 percent of the forest respectively.

Source: Calculated by author from Harvest Plans Map Viewer, see Figure 3 below.

The terminology used in the table reflects the terminology of *Nova Scotia’s Forest Management Guide*²³. Terminology and criteria associated with the various types of forest removal identified in the table are currently under review by the Department of Lands and Forestry, and accordingly the Department has issued *Interim Retention Guide*²⁴ to provide guidance on forest removal activities during the period of the review. In particular this Guide specifies forest removal in the case where planned forest removal activities are identified as “overstorey removal” or “seed tree harvest”²⁵. Based on these Guides, the terminology in Table 1 should therefore be understood as follows:

- *Overstorey Removal and Seed Tree Harvest.* Removal of 70 – 90 percent of trees (based on basal area), depending on the species and on soil type and depth. Based on the tree species and soil conditions generally found in the areas included in Table 1, it is likely that 80 – 90 percent of trees in these areas will commonly be removed.
- *Variable Retention.* Removal of 70 – 90 percent of trees based on basal area, according to the level of retention that has been specified for a stand.
- *Shelterwood.* Various shelterwood procedures are defined, but all require removal of overstorey sufficient to create light conditions to support growth of desired species; multiple removals of overstorey may be undertaken over 10 or more years to create desired conditions. Typically, “uniform” shelterwood practices that are planned in these cases may be expected to remove up to 60 percent of overstorey trees.
- *Salvage* The recovery of merchantable timber from trees within an area scheduled for “overstorey removal” but that have previously fallen as a result of wind or other factors.
- *Individual Tree Selection* Removal of 30% of basal area to promote uneven aged stands and mature overstorey at all times.
- *Partial Harvest* Removal of part of overstorey to partially achieve a management objective with the intent to remove additional overstorey at a later time to fully achieve a management objective.





Table 2, below, illustrates the impact of these levels of forest removal.

²³ Nova Scotia Department of Lands and Forests, 2018: *Nova Scotia’s Forest Management Guide*; <https://novascotia.ca/natr/forestry/programs/timberman/pdf/fmg.pdf>

²⁴ Nova Scotia Department of Lands and Forests, 2018: *Interim Retention Guide*; https://novascotia.ca/natr/forestry/forest_review/Retention-Guide-NS-Crown-Land.pdf

²⁵ “Overstorey removal” and “seed tree harvest” are more commonly referred to in public discourse as “clear cuts”

Table 2
Impact of Different Types of Tree Removal on the Forest

| | |
|---|--|
|  |  |
| <p>1. Overstory Removal, Seed Tree Harvest, Variable Retention: Removal of 90 percent of forest (1a, left) and 70 percent of forest (1b, right). Removal of 80 percent of forest is intermediate between these images. (Source: Nova Scotia Forest Notes, July 2018; http://nsforestnotes.ca/keeping-track/variable-retention-on-hpmv/)</p> | |
|  |  |
| <p>2. Shelterwood: Removal of overstory sufficient to create light conditions to support growth of desired species; multiple removals of overstorey may be undertaken over 10 or more years to create desired conditions.</p> | <p>3. Individual Tree Selection: Removal of 30% of basal area to promote uneven aged stands and mature overstorey at all times</p> |

Based on the data in Table 1, it is clear that approximately 70 percent (2,023.64 ha) of the 2,914 ha scheduled for forest removal immediately adjacent to the “core area” of Kejimikujik National Park and National Historic Site and the Tobetic Wilderness Area will be reduced to resemble the images in Table 2, images 1a and 1b, and a further 12 percent will resemble Table 2 image 2. It is clear from these images that the degraded areas that remain after these levels of forest removal are fully incompatible with the scientifically-established criteria for moose habitat referred to above. In addition: (i) these types of forest removal result in an even-aged regrowth that over time will limit the availability of younger forest patches that moose will rely on, particularly in winter; and (ii) the construction of roads to access the forest also degrades the adjacent habitat for mainland moose. Further industrial forestry activities may be undertaken to select for specific species composition that may be desired for commercial purposes, but which may reduce species (e.g. hardwoods) that may be desirable for high quality mainland moose habitat.

The ongoing heavy forest removals place further stress on potential future moose habitat as a result of impact on soil quality and the ability of soils to support regeneration of forest. Forest removal activities

expose soils, resulting in loss of carbon storage and increases in green house gasses. This promotes further leaching of nutrients that are already in limited supply on the thin, acid soils of the Southwest Nova Biosphere Reserve and which are already among the poorest soils in eastern North America. Regrowth of the forest is therefore slow, and wildlife carrying capacity (including for mainland moose) reduced is restricted.

6. Correlation of UNESCO World Biosphere Reserve Criteria with Southwest Nova World Biosphere Reserve

UNESCO has clearly stated, by way of Resolution, “the special importance of world biosphere reserves...for the conservation of biological diversity, in harmony with the safeguarding of the cultural values associated with them”²⁶.

UNESCO has adopted a strategy to give effect to this Resolution²⁷:

- Goal 1 of the strategy is “Use biosphere reserves to conserve natural and cultural diversity”. Special mention is made of the need to strengthen biosphere reserves, as necessary, to address fragmented habitats.
- Goal 2 of the strategy is: “Utilize biosphere reserves as models of land management and of approaches to sustainable development”.

UNESCO has adopted a legal framework that specifies²⁸:

- The function of a world biosphere reserve includes contributing to the conservation of ecosystems, species and genetic variation (Art. 3)
- Criteria that must be met by an area to qualify as a World Biosphere Reserve. Among several criteria, these include: (i) “a legally constituted core area or areas devoted to long-term protection”; and (ii) “a buffer zone or zones clearly identified and surrounding or contiguous to the core area or areas, where only activities compatible with the conservation objectives can take place”. (Art. 4)
- “Provisions should be made for: (a) “mechanisms to manage human use and activities in the buffer zone or zones”; (b) a management policy or plan for the area as a biosphere reserve; (c) a designated authority or mechanism to implement this policy or plan....”;
- A review of biosphere reserves should be undertaken every 10 years by the concerned authority to ensure the criteria that have been established (see Art. 4) continue to be met by all reserves.

The plight of the mainland moose within the Southwest Nova World Biosphere Reserve can be considered with respect to these points:

²⁶ 28C/Resolution 2.4 of the UNESCO General Conference (November 1995); <https://unesco.org/download/13/social-science-publication/187/the-seville-strategy-and-the-statutory-framework-of-the-world-network.pdf>

²⁷ Ibid.

²⁸ UNESCO, 1995: The Statutory Framework of the World Network of Biosphere Reserves; <https://unesco.org/download/13/social-science-publication/187/the-seville-strategy-and-the-statutory-framework-of-the-world-network.pdf>

1. The mainland moose – an apex herbivore and the largest terrestrial animal in Nova Scotia - is registered as an “endangered species” under the Nova Scotia Endangered Species Act. At the time that the Southwest Nova World Biosphere Reserve was established in 2001 in the order of 250 moose may have been present in the area of the Reserve.
2. The Department of Lands and Forests is responsible in law for planning, implementing and monitoring measures to achieve the recovery of endangered species. In fact, the evidence is that Department is effectively and actively supervising the extirpation of the mainland moose from Nova Scotia:
 - The Supreme Court of Nova Scotia has: (i) expressed dismay that the Department does not have reliable data on the existing population of mainland moose in the province; (ii) determined that the Department has failed to prepare/review a species recovery plan for the mainland moose in a timely fashion; and (iii) determined that the Department has not identified “core habitat” that can be the basis for a recovery of mainland moose populations.
 - The Department is engaged in removal of up to 90 percent of the forest in over 2,900 ha in the established buffer zone of Southwest Nova World Biosphere Reserve that is immediately adjacent to the core protected area of the Reserve; this contravenes the purpose of the buffer zone as set out in *The Statutory Framework of the World Network of Biosphere Reserves* established by UNESCO and which is the basis for the creation and operation of the Southwest Nova Biosphere Reserve.
 - The techniques that are planned for the removal of the above forest will result in regrowth of an even-aged forest that is structurally inappropriate for mainland moose habitat and which in any case will not reach the “mature” status identified by scientists as necessary for high quality mainland moose habitat for at least 100 years.
 - Additional areas of the established buffer zone in the Southwest Nova World Biosphere Reserve have been allocated by the Department of Lands and Forests for similar levels of forest removal, resulting in a further degradation of the land and ensuring it is not suitable as moose habitat.
 - The forest removal activities in the buffer zone of Southwest Nova Biosphere Reserve are only the most recently planned and current forest removal activities; the Department of Lands and Forestry has supervised forest removal activities for many years.
3. The governance structure of the Southwest Nova Biosphere Reserve is fatally flawed because although the Board includes a wide participation by local (municipal) decision-making entities and stakeholders, it does not (and, in accordance with its By-Laws, cannot) include representation from either the federal or provincial governments – and it is the provincial government that has exclusive control over the 457,000 ha buffer area that is being managed in ways that are demonstrably contrary to the legal requirement of a buffer zone in the context of a World Biosphere Reserve.
4. The inadequate governance structure means that the following that are required at a World Biosphere Reserve under UNESCO legislation are either absent or ineffective:

- Mechanisms to manage human use and activities in the buffer zone or zones;
- A management policy or plan for the area as a biosphere reserve;
- A designated authority or mechanism to implement this policy or plan.

UNESCO has inscribed the Southwest Nova World Biosphere as a member of its Network of World Biospheres without ensuring a governance structure capable of achieving its legally-mandated goals. The consequences have been, and continue to be:

- The Province of Nova Scotia (through its Department of Lands and Forestry) has free rein to undertake widespread and continuing destructive forestry management practices that are directly incompatible with: (i) the legally-established objectives of both the World Network of Biosphere Reserves generally to reflect principles of the conservation of biological diversity and the sustainable use of its components, and (ii) the specific legal requirement of a buffer zone to be an area where only activities compatible with the conservation objectives can take place.
- Because these destructive forestry practices take place in an area that is designated by UNESCO as a World Biosphere Reserve:
 - It is widely perceived that these practices are compatible with the values of biological conservation that are at the heart of the UNESCO World Biosphere program, when in fact they are demonstrably contrary to these values.
 - Education and awareness messages in support of the biological conservation values (in accordance with the UNESCO World Biosphere Program) are entirely misunderstood and compromised by forestry practices that are illegal (under UNESCO legislation) and destructive of the biological values that are intended by UNESCO to be promoted.

The failure of UNESCO to ensure an adequate and “fit-for-purpose” governance structure at the Southwest Nova Biosphere Reserve and its failure to adequately monitor the performance of the Reserve make it complicit in the failings of the Reserve. Most importantly, it makes UNESCO complicit in the looming extirpation of the mainland moose from Nova Scotia – an avoidable and directly contrary outcome to the objective of UNESCO and its World Biosphere Reserve program and a sad commentary on wildlife conservation in Nova Scotia at the end of the UN Decade on Biodiversity and its slogan: “Living in Harmony with Nature”.

7. Required Actions

The following immediate actions are needed to ensure the survival of the mainland moose in the Southwest Nova Biosphere Reserve:

1. The Minister of Lands and Forestry must immediately halt forest removal activities on the Crown lands that surround the “core area” of the Southwest Nova Biosphere Reserve.
2. UNESCO must immediately insist that the Crown lands that surround the “core area” of the Southwest Nova Biosphere Reserve be given the status of “buffer” in the sense that is defined in UNESCO’s legislation (The Statutory Framework of the World Network of Biosphere Reserves) and which it is duty-bound to uphold.

3. The Minister of Lands and Forests must participate in good faith with the Southwest Nova Biosphere Association in upholding the buffer zone in accordance with its intended purpose in accordance with UNESCO legislation.
4. UNESCO must supervise the review, revision and effective implementation of the following, in accordance with UNESCO's legislation governing the World Biosphere Reserves.
 - Mechanisms to manage human use and activities in the buffer zone or zones;
 - A management policy or plan for the area as a biosphere reserve;
 - A designated authority or mechanism to implement this policy or plan
5. The Minister of Lands and Forestry must immediately commit to the full and effective implementation of measures to achieve measurable increases in the population of mainland moose in the Southwest Nova Biosphere Reserve, and take appropriate measures to provide for the recovery of mainland moose and other species on the List of Species at Risk in both the Southwest Nova Biosphere Reserve and elsewhere in the province.

This document has been prepared for
Extinction Rebellion Nova Scotia
by Doug Hickman, Canning, Nova Scotia
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