

Two More Views on the Future of Wolves at Isle Royale National Park

Island Complications: Should We Retain Wolves on Isle Royale?

Tim Cochrane

The “natural” assumption

Most people who are familiar at all with Isle Royale assume that the national park’s famous populations of wolves and moose are “natural” residents of the archipelago. Thus, the impending decision of what to do if wolves became extirpated on Isle Royale seems to be an easy managerial one: replacement wolves should be brought in. But a historical view of major mammals on Isle Royale in the last hundred years reveals a much more complicated situation.

The first major published study on the wolves and moose of Isle Royale, L. David Mech’s *The Wolves of Isle Royale*, makes this very point. In a summary table of the “History of Isle Royale Mammals,” Mech makes an astounding observation: namely, that all the large mammals on Isle Royale have changed in the 20th century. Coyotes and lynx have gone and wolves appeared. Woodland caribou were extirpated and moose arrived and have become the dominant herbivore. Red fox arrived circa 1925. Otter were missing for much of the 20th century but now are quite common.¹ And a little earlier, in the late 1800s, beaver were nearly extirpated.² This radical composition turnover may be an effect of island biogeography. One primary indication of island biogeography is that the island(s) being studied have only a subset of the animals and plants found on the nearest mainland. Island biogeography also routinely maps species turnover on islands, as species “wink out” and different ones “wink in.”³ But also quite often a species winks out and then recolonizes on its own, as happened with otter and beaver at Isle Royale.

This fact of potential periodic and extensive change needs to be built into any discussions of augmenting wolf numbers in the near term. We need to acknowledge the possibility that the winking out of wolves on Isle Royale might be a natural phenomenon of island biogeography. But unfortunately, our yardstick for making such decisions is compromised: what appears to be the natural island fauna in the 20th century is actually a chimera, greatly altered by human actions.

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A recent article in *The George Wright Forum*, “Should Isle Royale Wolves be Reintroduced? A Case Study on Wilderness Management in a Changing World,” argues, among its conclusions, that long-term predator-prey studies are rare and invaluable. I agree. But to continue with this line of thought, I’d like to add further time depth, and in some cases comparative context, to the question of potentially supplementing wolves at Isle Royale. I wish to add historical context, because the history of moose and wolf presence on Isle Royale is more complex than the recent *George Wright Forum* article had space to articulate and consider. Further, discussion of the reintroduction question often ignores or downplays select facts in favor of a more compelling argument. What is needed, I believe, is a concerted effort to put pertinent facts on the table because the situation is complicated and thus all perspectives must be considered to reach the best possible decision.⁴ As one of the article’s co-authors, Michael Nelson, suggested to me in an email, such a decision should also include experts in what these animals mean to the American public or those who best understand biological symbolism.⁵

How did moose and wolves get to Isle Royale?

That moose and wolves made it to Isle Royale by their own agency is the bedrock of the prevailing narrative that considers their presence in the national park to be natural. For moose, it is thought that they arrived by swimming across the relatively narrow portion of Lake Superior that separates Isle Royale from northern Minnesota and Ontario. There is, however, an alternative scenario of how moose may have arrived on Isle Royale. It was documented by a Minnesota Department of Natural Resources biologist, Bill Peterson, who worked in Grand Marais on Minnesota’s North Shore, not far from Isle Royale. In a 1998 article he wrote:

In the early 1950’s, Dr. [Lyman B.] Clay⁶ stopped at a gas station in Mafeking, Manitoba.... An elderly man, perhaps in his 70’s, noticed Dr. Clay was from Minnesota and asked him how the moose were doing on Isle Royale. Dr. Clay informed him there were many moose on the island and they were doing well. The old man then related that he had lived in Minnesota when he was young and in about 1907 (perhaps 1905) he had been hired by the state of Michigan to work that winter with a crew live trapping moose near Baudette, MN. They captured either 11 or 13 moose but, in late winter, he became ill and was unable to accompany the others as they hauled the moose to Two Harbors, MN, where they were loaded onto barges and taken to Isle Royale.⁷

Peterson then described how the potential newspapers that might have substantiated this are unavailable, that this story seems somewhat far-fetched to him, and then questions why moose would be trapped from as far away as Baudette, Minnesota, which lies near the Manitoba border? As someone trained to evaluate oral history and narratives, I think there are elements to this story that give it credibility (namely its specificity of place and activity).⁸ There is also the possibility that this story is only partially correct: the entity at that time with the money and interest to make this happen was not the state of Michigan, but rather the Washington Harbor Club, a private club with some of the most well-to-do Duluth businessmen of the day. The club owned various buildings on the southwest end of Isle Royale

near where the national park's Windigo facilities are today. The club members also owned railroads that ran from Baudette to Duluth and Two Harbors, and so had the physical means to transport moose by railcar to Two Harbors.

This alternative story—that a small number of moose were put in pens on a fish tug at Two Harbors in 1905 or 1907 and then freighted over—provides a more practical explanation for the population explosion of moose, whose herd numbered more than 3,000 by the early 1930s, than does the prevailing narrative.⁹ Further, this explanation does not depend on the exceptional event of a male and female moose swimming miles to a grey mass on the horizon (Isle Royale) that they might not be able to smell in the wave troughs of Lake Superior seas.

For wolves, the prevailing narrative holds that the founding population crossed an ice bridge from northern Minnesota or Ontario sometime between 1948 and 1950. Then, in 1952, four wolves were brought to Isle Royale from the Detroit Zoo by an earnest wolf advocate named Lee Smits. The results of this purposeful re-introduction have long been assumed to have failed, that is, none of the four bred with the wild wolves and contributed to

Figure 1. This 1930s photograph of moose trapping at Siskiwit Bay, Isle Royale, for shipment to the Upper Peninsula demonstrates how moose were live-trapped in crates. The photograph illustrates how moose could have been trapped for shipment to Isle Royale two decades earlier. While there are a series of photographs of the 1930s moose trapping and transporting moose across Lake Superior to the mainland, there are no known photographs or newspaper articles of the purported moose shipments to Isle Royale ca. 1910. Courtesy of Isle Royale National Park historic photo collection.



the genetic make-up of Isle Royale's current wolf population. However, to date the genetic research is inconclusive and we can only definitively say that the wolf population "was originally founded by only one female and two males."¹⁰ Earlier mitochondrial DNA (mtDNA) research also suggests the wolves "descended from a single founding female" and that there is the "presence of a rare genotype in Isle Royale wolves."¹¹ The genetic founding question remains unanswered and thus leaves open the door for alternative interpretations. Could the founding female have been a wolf from the area of Ontario around Lake Nipigon having a mtDNA haplotype that was thought to be rare in 1990, when the first genetic studies were done?¹² Or could the founder have been one of the Detroit Zoo wolves, a female nicknamed "Queenie"? Moreover, could another of the zoo wolves, a male called "Big Jim," have survived long enough to interbreed?¹³

The possibility of the potential genetic role of Big Jim or Queenie has not been part of the public discourse on whether wolves should be re-introduced or their current low numbers augmented. Instead, recent news has highlighted the 1997 arrival of a male immigrant, nicknamed the "Old Gray Guy," who had an important impact on wolf genetics on the island.¹⁴ What is implicit in the stories about the Old Gray Guy is that his immigration was a natural phenomenon. This fits the prevailing narrative and is virtually the opposite of the implicit message about Queenie and Big Jim, which is that their presence was unnatural and therefore inappropriate in a national park. If more widely known, the possible role these zoo wolves may have had in founding the Isle Royale wolf population would be a counterpoint to the naturalness story into which the Old Grey Guy so nicely fits. Those of us in the National Park Service (NPS) who have told the natural migration story of wolves to countless park visitors should heed this counterevidence and pause a moment. It appears these storytellers, including myself, have a bias towards a natural immigration storyline for wolves and moose. Could it be that virtually all of us—biologists and park rangers alike—told this story to the public hundreds of times because we wanted there to be an absolutely natural start to the wolf population on Isle Royale? That it simply fits how we wanted the story to go?

As an aside, there was and is a counter-story in play among a small group of island residents. A number of Isle Royale commercial fishermen have long maintained that the Detroit Zoo wolves did contribute to the make-up of the Isle Royale wolf population, but their story was dismissed by academically trained biologists.¹⁵

If it seems a long shot that one or both of the zoo wolves could have contributed to the genetics of Isle Royale wolves, so too is the prospect of a male and female both crossing over from the mainland, as the prevailing narrative claims. Not only is there no evidence of it ever occurring prior to the putative crossing in the 1948–1950 period, wolf dispersals more commonly consist of an individual, not a pair or a whole pack. Dispersing wolves tend to be young, on average between one and two years old, and male and females tend to disperse at roughly the same rates. However, there is some new evidence to suggest male and female wolves disperse differently, that is, females favoring "more forest cover" and routes with lower risk. If these points are reliable, then the most likely immigrant to Isle Royale would be a young male.¹⁶ In a nutshell, either wolf establishment scenario (or some combination thereof) is extraordinary.

Why didn't moose and wolves arrive earlier?

One trope in the published history of moose–wolf research is a persistent warning about the two species' threatened existence on Isle Royale. In one of the first official reports of moose–wolf interactions on the island came the comment: “They [moose] cannot survive long without assistance.”¹⁷ There have been similar such warnings about wolves because of inbreeding (genetic depression) or invasive disease (canine parvovirus). Most recently, it is suggested that climate change is or will be the primary issue for moose health and the reason why future wolf immigration over Lake Superior ice to the park will become either exceedingly rare or impossible. The evidence of the latter is very convincing, especially for someone like me who can view Isle Royale daily from his office and see whether an ice bridge has formed (and is surviving pressure changes, lake currents, and winds). Today, ice rarely stretches beyond the protected confines of Grand Portage Bay and does not come close to extending all the way to Isle Royale.

But my main point is to reverse the question. If today there are far fewer ice bridges to the mainland on which wolves can immigrate to Isle Royale, why, then, wasn't there an earlier immigration to Isle Royale when ice bridges were more common? In 1875, for example, the ice was so thick that a team of draft horses were driven over the ice from Silver Islet (outside of present-day Thunder Bay, Ontario) to McCargoe Cove on the north side of Isle Royale.¹⁸ If ice bridges were more frequent and lasted longer in prior centuries, then why don't moose or wolf bones show up in the middens of the ancients who worked the native copper mines thousands of years ago or in Ojibwe encampments from a couple of centuries ago?¹⁹

Why didn't moose and wolves appear on Isle Royale during the historic period? Fortunately, we have a few pertinent documents that throw some light on mainland conditions that may have impacted migration of mammals to Isle Royale. These conditions are primarily anthropogenic. If this is correct, we need to shift the presumption about the naturalness of wolves and moose arriving on Isle Royale to, at minimum, that of a narrative about unintended consequences of human actions on a regional scale. Or recasting these topics, climate change is but an acceleration of anthropogenic unnaturalness that predates the arrival of moose and wolves on Isle Royale.

So, why hadn't moose and wolves made it to Isle Royale prior to circa 1905 and circa 1950, respectively? For moose, a male *and* female must swim the 12–25 miles across Lake Superior, either together or one soon after the other. A wolf (or a pair of them) crossing on ice seems comparatively much more possible and requires less of an effort. And the ice bridge was at times “substantial”: for example, in the 1870s regular mail service by dog team went over the ice from Grand Portage to Island Mine, Isle Royale.²⁰

A reasonable explanation of why moose and wolves are relatively late migrants to Isle Royale is that their numbers on the nearby mainland were comparatively low. Hunting of big game, first by fur traders and then by Ojibwe men to stave off hunger after the golden years of the fur trade were over, depressed moose numbers in the region. A noted ethnohistorian, Charles A. Bishop, writing of the area west and northwest of Lake Nipigon, said that “prior to 1800, both furs and game were plentiful and Indians could obtain enough pelts to supply their trade needs with ease.... By the 1820's moose had been totally exterminated, while

caribou had grown extremely rare.... Except for one stray moose seen in 1833 this is the last mention of a moose killed in the Albany District until 1893.”²¹ The lack of moose in the Lac Seul District was paralleled with the dearth of moose at Fort William in Thunder Bay, immediately north of Isle Royale.²²

So for a number of decades during the 1800s there were few moose immediately north of Isle Royale available to immigrate to the island—clearly a human-caused consequence. It is interesting to note that while woodland caribou were also regionally scarce, a small population lived on Isle Royale during the 1800s, as Ojibwe hunters would go there to hunt them.²³

However, with the arrival of logging great change came to the region, resulting in a reversal in numbers of moose and others species. From 1870 to 1910, the Lake Superior region-wide cutting of white and red pine, and the subsequent dramatic ecological change brought about by the logging, initially favored herbivores such as moose (and, today, white-tail deer).²⁴ The cutting of the pines changed the forest composition so that aspen and birch increased, and forest fires in the cutover areas became more frequent, all of which are favorable to herbivores. The end of the era of old-growth cutting, increasingly effective game laws, increased numbers of moose in the region, and the appearance of moose on Isle Royale all coincide.²⁵

The increase in herbivores also meant an increase in prey species in the region, giving wolves more to eat; thus their numbers should have increased. The likelihood of wolves dispersing to Isle Royale over an ice bridge should also have risen dramatically, except for the effects of wolf trapping in Ontario. A driving force in trapping was the relatively high price of pelts in Ontario in the 1920s and 1930s.²⁶ The important trend to note is that from 1925 to 1940 an average of 2,990 wolves were harvested annually in Ontario. After that, with the onset of World War II and Canadian men’s participation in the war effort, no wolves were trapped and their numbers must have rebounded significantly. Eight or ten years after the cessation of wolf trapping in Ontario, the first wolves are observed on Isle Royale. While this evidence is certainly circumstantial, there appears to be a temporal coincidence between price of wolf pelts, the absence of trapping in Ontario, a likely shortage of Ontario trappers during World War II, and the appearance of wolves on Isle Royale.



Figure 2. Coyote pelts at a Chippewa Harbor fishery in 1926, prior to the establishment of the park. Occasionally fishermen would overwinter on Isle Royale and their trapping results could range from the very successful (as in this photograph) to the meager. Courtesy of Isle Royale National Park historic photo collection.

Should we intervene?

If all this is true, then it is a succession of human actions—inadvertent intervention to be sure—that has had a direct role in wolves “naturally” appearing on Isle Royale. But even if moose and wolves had arrived on Isle Royale as a very direct consequence of human action, does that change the question of whether we should intervene to maintain the wolf population in the national park? For comparison, neither wolves nor moose are present on Michipicoten Island, an archipelago in northeastern Lake Superior that is similar in distance from the mainland as is Isle Royale.²⁷ Due north of Isle Royale and much closer to the mainland, wolves made it to the Slate Islands, hunted woodland caribou, and then left in the 1990s. Could the arrival of moose and wolves on Isle Royale be more an aberration than an inevitable event?

Furthermore, if recent immigrants to the park were aided directly or indirectly by human actions, does that make them “exotic species” as defined by NPS management policies? NPS defines exotic species as those “that occupy or could occupy park lands directly or indirectly as the result of deliberate or accidental human activities....”²⁸ The newly crafted resource management recommendation for the NPS, *Revisiting Leopold: Resource Stewardship in the National Parks*, is written, in part, as a policy response to the array of environmental changes such as climate change that are confronting national parks. The report calls for an expanded scientific capacity to guide resource management “to steward NPS resources for continuous change that is not yet fully understood, in order to preserve ecological integrity....” Wolves are clearly native to the region, but perhaps not to Isle Royale. Might their indigeneness to the region and their place in the ecological process in the region outweigh their potential non-native history on Isle Royale? Because wolves are part of a “largely self-sustaining and self-regulating” Isle Royale ecosystem, should we overlook their questionable “natural” tenure? If so, we should at least make this decision transparently.

Intervention can be an important tool to maintain a park’s ecological resiliency. But “intervention” as a concept exists on a continuum of human actions that range from unintended consequences (wolf trapping on Ontario) to intervention (radio collaring of wolves and moose on Isle Royale, closures of zones to protect denning areas, closure of the park to dogs and cats) to intentional manipulation (the introduction of the Detroit Zoo wolves).

A historical view of Isle Royale’s mammalian history suggests there are both known and likely unknown limits to species persistence through time. It is likely that many animal species’ tenure on the island is episodic, ranging from a single colonizations of short duration to persistence lasting decades. It may not always be anthropogenic forces that result in a species winking out or another winking in; an example is the episodic presence of sharptail grouse at Isle Royale. A historical view of the relatively short and possibly atypical residence of wolves suggests the proposed reintroduction could become a recurring need to sustain the health and persistence of the population. Do we want to reintroduce wolves to Isle Royale National Park every 50 or so years?

To further explore how much intervention is appropriate, it’s useful to turn to a long-used Isle Royale metaphor, namely, that the national park is an “outdoor laboratory.”²⁹ Vucetich et al. are proposing a level of intervention for wolves which bespeaks of the park as more of a laboratory. If intervention is too frequent, then Isle Royale stops having the feel of an

outdoor laboratory, and its wilderness character is diminished to boot. Periodic interventions would run counter to one component of the Wilderness Act, namely, that “the imprint of man’s work” must be “substantially unnoticeable.” But Isle Royale has not been unimpacted for quite some time. Regional, national, and global impacts have greatly altered the naturalness of the Isle Royale lands and waters, even if the results are sometimes hard to see.

Authenticity and integrity

Two concepts informing and providing some guidance to the prospect of intervention are the ideas of “authenticity” and “integrity.” Both concepts are used widely in cultural resources discussions and “cultural and historical authenticity” is a goal articulated in the *Revisiting Leopold* report.³⁰ If an ecosystem has integrity or authenticity, then you don’t intervene. If the system is thought to have lost integrity, then intervention makes more sense. Vucetich et al. define wolves and moose as a necessary part of ecosystem health of Isle Royale. But are ecosystem health and biological integrity the same, or are the differences substantial enough that they matter? To be more specific, could a genetically renewed wolf population contribute to ecosystem health but be contrary to the biological integrity of the park? Further, ecosystem health or functioning must be viewed through the lens of the nature of a distant and modest-sized archipelago. Getting to, and the ability to persist on, Isle Royale is a quintessential condition of life on the island; or, restated, it has always functioned differently than a mainland ecosystem. To do a good job of intervening, we must be crystal clear about what are goals and then approach them with humility and caution, as unintended consequences are highly probable.

The backdrop condition on Isle Royale is that it has become harder to find monetary support for the moose–wolf research. Financial support for the study competes with other biological topics and within a limited park budget and staffing scenario. Thus it is important to place the potential of further renewed moose–wolf research in the context of other research needs.

While the wolf–moose study is the first among equals in length, breadth of conclusions and applications, world renown, productivity, etc., other scientific efforts are important, necessary, and ongoing. It is important to acknowledge that the moose–wolf study has provided Isle Royale National Park with a cachet and reputation that it would not otherwise have. And it is important to acknowledge that the park has, largely because of the wolf–moose study, a long-standing tradition of top-tier scientific endeavor. But is that research as important, or more important, than having an authentic mammalian composition?

Any wolf reintroduction decision should ideally be informed by a determination of whether Queenie or Big Jim had a founding effect among Isle Royale’s wolf population. And the origin of moose on Isle Royale should play a part in such a consideration. If purposeful introduction of moose and wolves is the origin of these species in the national park, then it’s hard to argue that the default species should be moose and wolves, despite the remarkable science that has been done or the very public celebration of these animals as Isle Royale icons.³¹ On the other hand, can the important and path-breaking science—based on moose and wolves—outweigh some of the “complications?” Can the long-term data generated from studying moose and wolves have a value above and beyond the restricted indigenosity of

these animals on Isle Royale? Do we acknowledge that “what’s done is done,” and make the best of the present resident animals as if it were natural? And yet once “rescued,” the wolf population will always be viewed with an “asterisk” or as an “altered data set.” Or are the data generated from monitoring the winking out of wolves (and moose?) on Isle Royale as or more important than continuing the scientific status quo through wolf genetic intervention?

Most of the limited number of mammals residing in Isle Royale National Park today have run a gauntlet of more than 200 years of sweeping anthropogenic forces. Out of this choppy history it’s difficult to conclude what is “natural.” But it is the unchanging geographic situation of Isle Royale, its remoteness in Lake Superior, that has been and should continue to be the primary determining fact in the national park’s management. Its character and integrity as a remote archipelago must be acknowledged and heeded. To supersede the insular character of Isle Royale by reintroducing wolves is arguably toying with its biological and historical authenticity—and, perhaps, with the most fundamental biological-given of island life, which is the screening Lake Superior has done through the millennia of which animals and plants make it there.

Conclusion

What needs to be done is to put all the relevant facts and reasonable options on the table for all to consider. Regularly scheduled biological interventions or “rescues” seem unreasonable to me and violate “island rules” of the difficulty of getting and staying there. There clearly need to be some limits and rules made for any future interventions. Accelerating climate change compounds the decision of what large mammals might last on Isle Royale, not to mention whether they might cross the waters. Further impacting any acceptable decision is that today’s visitors to Isle Royale want it to be a remarkable, geographical wonderment, which is nicely reinforced through the presence of charismatic large mammals—moose and wolves.³²

Are there other reasonable options in response to the extirpation of wolves? Could a wolf-less Isle Royale National Park be “exchanged” for one in which lynx is a major predator? Working on a nearby reservation with Ojibwe who have treaty rights on Isle Royale, I hear the question asked, “Why can’t I hunt Isle Royale moose?” Could this be a means to manage moose numbers if wolves are extirpated?³³ In the broadest and most informed forums, the National Park Service needs to define what is an acceptable intervention. Do we agree that we should, as a goal, manage the park as close to once-natural conditions as is possible? Does this include indirect and direct intervention? How often are we prepared to intervene?

The biological history of Isle Royale has radically swung in terms of its mammalian make-up. This is, in part, a function of island biogeography. But, if so, then how do we incorporate this precondition into our decision-making about wolf reintroduction? Many people want wolves to continue on Isle Royale because they think that to do so is normal and natural—a position which is not necessarily substantiated by the facts. What is our ethical responsibility to let the public know wolves (and moose) reside on Isle Royale through a particular set of circumstances that may not be natural? And that extirpation—winking out—is common in island ecosystems? We must provide this information before visitors can arrive at an informed opinion about wolf intervention. Finally, how do we as a society manage the national

park true to its biogeographic character with biological integrity, while honoring the public's desire to have special animals present (today this means wolves and moose) that embody the distinctiveness of the archipelago?³⁴

Disclaimer

The views expressed in this article are the author's alone and do not represent those of the National Park Service.

Endnotes

1. L. David Mech, *The Wolves of Isle Royale*, Fauna of the National Parks of the United States Fauna Series no. 7 (Washington, DC: US Government Printing Office, 1966), p. 17. See also Peter A. Jordan, Brian E. McLaren and Scott M. Sell, "A Summary of Research on Moose and Related Ecological Topics at Isle Royale, U.S.A.," *Alces* 36 (2000), p. 236; and James T. Harris, "Wildlife in a Changing Environment," in *The Great Lakes Forest: An Environmental and Social History*, edited by Susan L. Flader (Minneapolis: University of Minnesota Press, 1983), p. 78.
2. Sometime in the 1800s beaver were practically extirpated at Isle Royale by trapping. The original General Land Office surveyor, William Ives, noted only old and abandoned beaver dams in 1847. Some fifty years later, in the early 1890s, the Wendigo Mine Company doctor, William P. Scott, found only abandoned beaver houses. William Ives Survey Notes, unpublished, Isle Royale National Park Archives, Houghton, Michigan; and William P. Scott, "Reminiscences of Isle Royale," *Michigan History Magazine* 9:3 (1925), p. 408. Beaver were rare on the Ontario mainland adjacent to Isle Royale by 1780, because of the impacts of the large fur trade companies. See "Depletion of Beaver" in R. Cole Harris, editor, *An Atlas of Canada: From the Beginning to 1800* (Toronto: University of Toronto Press, 1987), plate 63.
3. Thomas W. Schoener, "The MacArthur-Wilson Equilibrium Model: A Chronicle of What it Said and How it was Tested," in *The Theory of Island Biogeography Revisited*, edited by Jonathan B. Losos and Robert E. Ricklefs (Princeton: Princeton University Press, 2010), p. 67. Vucetich et al. prefer the use of the term "extinction" in their article rather than "extirpation." While "extinction" has a wider colloquial application, what we are really discussing is the potential extirpation of wolves on Isle Royale. The article particularly highlights the scientific consequences of a wolf die-off, especially the bracketing off of valuable data and knowledge, or data and study extirpation, if you will. I use the terms "winking" in and out as it is used in island biogeography literature and is a counterpoint to the more dramatic (and consequential) term "extinction."
4. The question of reintroducing wolves to Isle Royale is impacted by the small pool of discussants directly involved, the nature of their personal relationships, and vested interests of many. I have thus concluded that some disclosure of my relationship to the "wolf researchers" is warranted. First, I have been an admirer of Rolf Peterson's work for many decades. However, I am not a biologist. That admission, however, should not disqualify me from commenting on the article in question as the issues surrounding "intervention" and "naturalness" is as much philosophical and linguistic as biological, and so not exclusively the domain of wildlife biologists. I further acknowledge that Rolf Peterson and now John Vucetich do remarkably thoughtful, rigorous, and highly focused as well as broadly based research. And I strongly believe that research should be encouraged and nurtured in a manner than has not always occurred in the past. I also share these scientist's interest in Isle Royale National Park as a long-term research focus, but from a humanistic perspective of the island's rich cultural history.
5. Michael P. Nelson, personal communication, September 11, 2012.
6. Lyman Clay (1911–1989) was a medical doctor who once had a summer home at Rock Harbor, Isle

- Royale. For a short time, he was the park doctor during the summer months when he was in residence.
7. Bill Peterson, "The Elusive Origins of Isle Royale's Moose," *The Moose Call* 8 (December 1998), pp. 12–13. Peterson also published this account in a local newspaper, the *Cook County* [Minnesota] *News Herald*, July 12, 1999. See also Jordan et al., "A Summary," p. 236. It is difficult to confirm this story. However, we do know that at this time that the state of Minnesota was permitting the shipping of live and dead moose, with a fee of only 50 cents per animal. For example, in 1908 the state of Minnesota permitted 32 moose to be shipped within and beyond the state boundaries. "Shipment of Big Game," Game and Fish Distribution Records, Game and Fish Commission, State of Minnesota Archives, Minnesota Historical Society, St. Paul, Minnesota. We also know that the state of Michigan purposefully introduced white-tailed deer to Isle Royale circa 1912. George Shiras 3rd, *Hunting Wild Life with Camera and Flashlight: A Record of Sixty-five Years' Visits to the Woods and Waters of North America—Volume 1, Lake Superior Region* (Washington, DC: National Geographic Society, 1935), p. 189.
 8. See for example, Axel Orlrick, *Principles for Oral Narrative Research*, translated by Kirsten Wolf and Jody Jensen (Bloomington: Indiana University Press, 1992); Barbara Allen and William Lynwood Montell, *From Memory to History: Using Oral Sources in Local Historical Research* (Nashville: American Association for State and Local History, 1981).
 9. A "third" explanation about how some moose may have arrived at Isle Royale was told by long-time Isle Royale resident Edgar Johns. In an oral history interview he stated that "the Indians at Grand Portage noticed a 'herd of moose' leaving the Canadian shore at Pine Bay for Isle Royale. Behind them were some brush wolves [i.e., coyotes]." Johns family members lived in Grand Portage at the time. Interview by Helen M. White, Minnesota Historical Society, St. Paul, Minnesota. Fisherman Stan Sivertson indirectly gave this account some credence when he said moose and coyotes show up at the same time, around 1913. Stanley Sivertson interview by Lawrence Rakestraw, 13 September 1965, Isle Royale National Park archives. The phrase "herd of moose" seems questionable; perhaps it was meant to signify a few moose. Moose ordinarily do not move as a herd in winter time, or cross large stretches of ice.
 10. Jennifer R. Adams, Leah M. Vucetich, Philip W. Hedrick, Rolf O. Peterson and John A. Vucetich, "Genomic Sweep and Potential Genetic Rescue During Limiting Environmental Conditions in an Isolated Wolf Population," *Proceedings of the Royal Society B*, 30 March 2011, p. 1.
 11. R.K. Wayne et al., "Conservation Genetics of the Endangered Isle Royale Wolf," *Conservation Biology* 5:1 (March 1991), p. 48.
 12. Rolf O. Peterson, personal communication, January 9, 2013.
 13. The other Detroit Zoo wolf that may have interbred with wild wolves was a male called "Big Jim." What we know definitively about these animals is scant. What we know of Queenie's parents is that she was the offspring of "a male wolf-coyote hybrid from downstate Michigan," and a mother "from the west, most like the S[outh] Yukon...." Paul Brown, natural resource manager, Isle Royale National Park, personal communication, September 10, 2012. Big Jim's mother was "a 'black' lobo from the Canadian northwest.... [H]is father, a Michigan timber wolf." And "Both of surviving wolves are of similar stock...." They were inoculated against rabies and distemper, comparatively tame, and were fed fish offal and dog food for less than a week at the Edisen Fishery. Big Jim and Queenie lived for a minimum of 41 days after their release from pens at Edisen Fishery; after that point, sightings stop either because there were few staff on the island to observe them, or else they had died. If they learned to eat fish offal, they could have survived on the plentiful supplies from multiple commercial fisheries that dropped the offal at isolated "gut bays." Thirteen fisheries were in operation in 1952, located throughout the national park, and fall would be the maximum harvest time for lake trout, lake

herring, and menominee. To give a sense of scale, the 13 fisheries, with approximately 26 fishermen, held licenses permitting maximum total gill net footage of over 1 million feet. Offal would have been available until November and thus conceivably the zoo wolves did not need to kill moose until later. Isle Royale superintendent to Lee Smits, September 26, 1952; Lee Smits to NPS director, May 8, 1952; Smits to Isle Royale superintendent, May 2, 1953; Smits to Isle Royale superintendent, June 15, 1953, all located at Isle Royale National Park archives; and “Isle Royale National Park, 1953 Fishing Table,” Isle Royale National Park archives. Ultimately their fate over the 1952–1953 winter is unknown. Their survival would be a remarkable story, as they were zoo raised and thus knew nothing about hunting moose. Despite the long shot of their survival, Isle Royale residents told stories about Big Jim for years. However, few stories were told about Queenie, perhaps because sightings of her were rare, she was smaller and thus less conspicuous, and thus her fate unknown. “Wolf Planting Project,” memorandum, Isle Royale superintendent to chief ranger, August 26, 1952, Isle Royale National Park archives. One of the report’s bullets says “Very rare mtDNA, possible derived from Detroit zoo wolf female.” Anonymous, “Main Events in ISRO Wolf History,” Isle Royale National Park, 2012, Houghton, Michigan.

14. John A. Vucetich and Rolf O. Peterson, Michigan Technological University, “Ecological Studies of Wolves on Isle Royale, 2010–11,” March 11, 2011, and Jennifer Donovan, “Poop Reveals an Immigrant in Isle Royale Wolves’ Gene Pool,” *Michigan Tech News* March 31, 2011.
15. Pete Edisen’s fishery was chosen as the place where the four zoo wolves could acclimate to Isle Royale conditions. Interview with Peter and Laura Edisen by Lawrence Rakestraw, September 3, 1965, and interview with Ed and Ingeborg Holte by Lawrence Rakestraw, September 10, 1965, Isle Royale National Park Oral History collection. Confidential Memorandum, August 26, 1952, Isle Royale Chief Ranger to Isle Royale Superintendent, Isle Royale National Park files, Houghton, Michigan. Pete and Laura Edisen were intimately involved in the wolf “experiment” as the four wolves when first released caused them “considerable trouble” destroying one nylon fish net and three small rugs on a clothesline.
16. L. David Mech and Luigi Boitani, *Wolves: Behavior, Ecology, and Conservation* (Chicago: University of Chicago Press, 2003), pp. 12, 14; Adrian Treves, Kerry A. Martin, Jane E. Wiedenhoef, and Adrian P. Wydeven, “Dispersal of Gray Wolves in the Great Lakes Region,” in *Recovery of Gray Wolves in the Great Lakes Region of the United States: An Endangered Species Success Story*, edited by Adrian P. Wydeven, Timothy R. van Deelen, and Edward J. Heske (New York: Springer, 2009), p. 200.
17. James Cole, “Isle Royale Wildlife Investigations, Winter of 1956–57,” Isle Royale National Park files, Houghton, Michigan.
18. *Duluth Minnesotan*, March 13, 1875.
19. Terrance J. Martin, “Prehistoric Animal Exploitation on Isle Royale,” in Caven Clark, *Archeological Survey and Testing, Isle Royale National Park, 1987–1990 Seasons* (Lincoln, NE: Midwest Archeological Center, 1995), p. 212.
20. *Duluth Minnesotan*, January 9, 1875. This is a solicitation for a contract mail carrier who was expected to travel to Isle Royale from Grand Portage once a week. The contract stipulated the mail carrier would leave Grand Portage by 7 a.m. and arrive at Island Mine, Isle Royale, by 5 p.m. the same day. The contract was for winter travel by dog team as well as presumably by mackinaw sailboat in the summer months. Regular ice bridges are the assumption behind this mail contract.
21. Charles A. Bishop, *The Northern Ojibwa and The Fur Trade: An Historical And Ecological Study* (Toronto: Holt, Rinehart, and Winston, 1974), pp. 11–12, 116.
22. A Hudson Bay Company factor at Fort William [today part of Thunder Bay, Ontario] would remark in 1824: “Formerly there were moose deer—at this time not one is to be seen, being literally extinct...”

Hudson Bay Company Archives, Winnipeg, Manitoba, B-231-e, John Haldane, "Report on the State of the Country and Indians in Lake Superior Department, 1824."

23. Timothy Cochrane, *Minong—The Good Place: Ojibwe and Isle Royale* (East Lansing: Michigan State University Press, 2009), pp. 81–83.
24. Rolf O. Peterson and Robert J. Krumenaker, "Wolves Approach Extinction on Isle Royale: A Biological and Policy Conundrum," *The George Wright Forum* 6:1 (1989), p. 14.
25. Mech, *The Wolves of Isle Royale*, p. 20; Jordan et al., "Research on Isle Royale," p. 236.
26. Milan Novak et al., *Furbearer Harvests in North America, 1600–1984* (Toronto: Ontario Ministry of Natural Resources, 1987), pp. 248–249. Beginning with World War II years, from 1940 through 1955 there was no trapping of wolves in Ontario.
27. Michipicoten Island is an island archipelago like Isle Royale (with geological, biological, and historical similarities) but one-third its size. Ontario Ministry of Natural Resources, *Michipicoten Island Provincial Park, Interim Management Statement* (Toronto: Ontario Ministry of Natural Resources, 1986), p. 4; David C. Whyte, *Introduction to Michipicoten Island: Lake Superior's Wild Heart* (privately printed, 2001), p. 21.
28. National Park Service, *Management Policies 2006* (Washington, DC: Government Printing Office, 2006), p. 43.
29. An early use of the metaphor is found in Mech, *Wolves of Isle Royale*, p. 3.
30. National Park Service, *Revisiting Leopold: Resource Stewardship in the National Parks* (Washington, DC: National Park Service, 2012), pp. 12–13.
31. It is informative to note that wolves are not resident on other Lake Superior archipelagoes or offshore islands—the Slate Islands, Caribou Island, or Michipicoten Island.
32. Timothy Cochrane, "Folklore and the Geographical Character of Two Natural Parks—Isle Royale and Michipicoten," *American Folklore Society*, October, 1987. There is a long-standing tradition of celebrating exotic features of Isle Royale, be it solid masses of native copper, prehistoric copper mining, greenstones, "Rein deer," huge and plentiful lake trout, and, now, wolves and moose. The complement of major animals on Isle Royale (now and in the past) often is a *de facto* counterpoint to those found in much of the Midwest, further emphasizing the national park as being a different place.
33. Some of these Ojibwe are members of the moose clan and have family history ties to Isle Royale. And, ironically, Grand Portage (and other Ojibwe Bands) recently elected to not permit wolf trapping or hunting on their reservation, unlike elsewhere in the state of Minnesota. The Ojibwe tribes cited cultural connections to wolves as a reason to not permit their "take." In short, they have long-standing traditions and beliefs about these animals, and Isle Royale is part of their traditional territory.
34. Thank you to select staff at Grand Portage National Monument, Isle Royale National Park, and the Western Great Lakes Inventory and Monitoring Network (National Park Service) that have read and commented on this paper.

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