The Curious Case of The Pizzly:

The Bears of The Arctic in 2040

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Background

Once upon a time, there were brown bears (Ursus arctos) that lived in ancient Ireland (Welsh, J. 2011). Some of their descendants migrated to new habitats: one group moved north, and another group moved south. The northern group became polar bears (Ursus maritimus) and the southern group evolved into grizzly bears (Ursus arctos horribilis) (Bears with us. (n.d.)). For over 500,000 years, they lived in separate habitats, and they had little contact with each other. Until now.

Vanderbilt University. 2021. Larisa DeSantis, *Vanderbilt researcher explains Pizzly bear hybrid species.* **[video]** https://news.vanderbilt.edu/2021/04/20/vanderbilt-researcher-explains-pizzly-bear-hybrid-species/

With the melting arctic ice forcing polar bears southward and receding forest habitats driving grizzly bears north, species hybridization from anthropogenic change has brought us the pizzly (grolar) bear. Pizzly bears are thought to happen when male grizzly bears venture into polar bear regions to find food and mate. The pizzly bear was

identified when a hunter killed one in 2006. Since then, eight more have been identified while polar bear numbers continue to decrease by 30% over the next few decades (Turner, B. 2021).

Hybridization happens with most animals, even humans. However, in this instance, human activities (climate crisis, industry, etc.) are causing unforeseen environmental changes that are resulting in possibly new species evolving. Even though polar/grizzly hybridization is still novel and science lacks sufficient data to determine the immediate and long-term effects on biodiversity in the Arctic, the pizzly serves as an indication as to the status of the habitat not only for the pizzly but for its parents as well.

Since the initial 2006 discovery, there have been a few scientific studies conducted and an extensive amount of “TV news” human-interest stories, articles, blogs, and speculative commentaries over the last 17 years. Pongracz et al. (2017) discuss their study of 25 bears conducted in the Western Canada Arctic region. DNA analysis revealed the existence of more pizzlies but with a curious twist: they were descended from the same polar bear mother but different grizzly bear fathers. A remarkable coincidence? Possibly but grizzly males are increasingly becoming more numerous on the Arctic islands where female polar bears are common. Hybridization, even among closely related species, is a complex possibility without predictable outcomes. Yet, the loss of habitat due to anthropogenic changes is increasing the odds of such encounters, therefore the possibility of more pizzlies and an unknown degree of future survival stress on two already struggling species.

Research Questions

Non-profit organizations (NGOs) such as the World Wildlife Fund (WWF) and Vital Ground are working relentlessly on sustaining and improving the current habitats for both polar and grizzly bears respectively. The arrival of Pizzly serves as another portent of the rapid changes occurring in these regions and yet another uncertainty regarding their efforts to protect and restore the bear populations. *What does the pizzly's arrival mean for the polar and grizzly bears? Will conservation and environmental mitigation efforts be sufficient to sustain future bear populations or is nature forced to eliminate the polar and grizzly bears and possibly replace them with a hybrid pizzly bear more suited for the new climate normal in 2040?*

Research Approach

As a starting point, a literature review of existing research materials, such as peer-reviewed studies and articles, and related materials found on the NGO websites, was conducted. To gain some explorative insights into the bears' status in 2040, it was necessary to identify possible external factors or "drivers of change" that could shape present and future conservation efforts by the NGOs. These drivers were identified with the virtual research assistance of ChatGPT, which I posed the following research questions:

1. *Please identify the social, technological, economic, environmental, and political driving forces related to pizzly or grolar bears. ChatGPT returned with ten drivers.*
2. *Can you give one more driving force per category? ChatGPT returned with five more drivers.*

3. *Please rank all 15 drivers by uncertainty.*
4. *Please rank all these drivers according to impact.*

ChatGPT concluded with “It's important to note that these rankings are subjective and that each driving force may have different impacts depending on the specific context and circumstances. Additionally, there may be other driving forces that are not included in this list that could also be significant” (ChatGPT, 2023).

Subjective is the correct word for this study. There are a lot of unknown variables, the interdependencies between them (if any) lack clarity, and the continuing global and local human activities persist in having a “difficult to measure” detrimental effect on the Arctic region, wildlife, and habitats.

15 possible drivers are organized along STEEP (Social, Technological, Economic, Environmental, and Political) categories. The numeric ranks of their impact and uncertainty (adjusted) are then averaged to produce an overall importance ranking.

Driver Name	Description	STEEP Category	Impact	Uncertainty	Ranking
Pizzly Fascination	Public interest and fascination with hybrid animals have led to increased media attention ad awareness of pizzly and grolar bears. **Source: ChatGPT**	Social	9	11	9.5
Indigenous Communities	Indigenous knowledge and perspectives on Arctic wildlife may include traditional stories or beliefs about hybridization events.	Social	4	5	4.5

	Source: ChatGPT				
Scientific Community	Interest from the scientific community in studying hybridization events has contributed to a better understanding of the genetic and ecological implications of pizzly and grolar bears. **Source: ChatGPT**	Social	5	7	6
DNA Research	Advances in genetic testing and sequencing technology have allowed researchers to better understand the genetic makeup and evolutionary history of pizzly and grolar bears. **Source: ChatGPT**	Technological	7	10	8.5
Hybridization	Increased use of remote sensing and monitoring technology to track the movement and behavior (including mating) of Arctic bears, including hybrid animals. **Source: ChatGPT**	Technological	2	4	3
High Tech Surveillance	Use of drones and other aerial imaging technology to study the behavior and movement of pizzly and grolar bears, which has allowed researchers to collect data on these animals in a non-invasive way. **Source: ChatGPT**	Technological	11	6	8.5
Tourism	Impacts on Arctic tourism and recreation, as the emergence of new and unique hybrid animals such as pizzly and grolar bears may attract visitors to the region. **Source: ChatGPT**	Economic	12	13	12.5
Industry	Potential impacts on resource extraction industries, as the presence of hybrid animals may have implications for environmental assessments	Economic	14	14	14

	or other regulatory processes. **Source: ChatGPT**				
Fur Trade	Potential impacts on the fur trade, as pizzly and grolar bears may produce unique pelts that could have commercial value. **Source: ChatGPT**	Economic	8	8	8
Climate Change	Impacts of climate change on Arctic ecosystems, which may be contributing to the increased frequency of hybridization events as species ranges shift and overlap more frequently. **Source: ChatGPT**	Environmental	1	1	1
Habitat	Impacts of habitat loss and fragmentation on Arctic wildlife, which may be driving some species to interbreed with related species in order to adapt to changing conditions. **Source: ChatGPT**	Environmental	3	3	3
Prey Availability	Changes in prey availability, which may be driving some pizzly and grolar bears to interbreed in order to access new food sources or adapt to changing environmental conditions. **Source: ChatGPT**	Environmental	6	2	4
Wildlife Management	Implications for international wildlife management and conservation policies, as the emergence of new hybrid animals such as pizzly and grolar bears may require new approaches to regulation and management. **Source: ChatGPT**	Political	15	9	12
Land Management	Implications for Indigenous land use and management practices, as traditional ecological knowledge may inform management decisions related to hybrid animals.	Political	13	12	12.5

	Source: ChatGPT				
International Conservation	Implications for international agreements on biodiversity and conservation, as the emergence of hybrid animals such as pizzly and grolar bears may challenge traditional taxonomic classifications and require new approaches to regulation and management. **Source: ChatGPT**	Political	10	15	12.5

Critical uncertainties analysis

“These driving forces are complex and interrelated, and their impacts on pizzly and grolar bears are not yet fully understood. Further research and collaboration among different sectors and stakeholders will be necessary to better understand these forces' implications and develop effective management strategies for hybrid animals in the Arctic.” (ChatGPT, 2023)

Wicked problems like climate change can cause cascading issues with sea ice, wildlife, plant life, and even indigenous human communities living in the Arctic region. Since carbon emissions are not decreasing at recommended rates, predicting future effects becomes more uncertain with one exception: it will get worse.

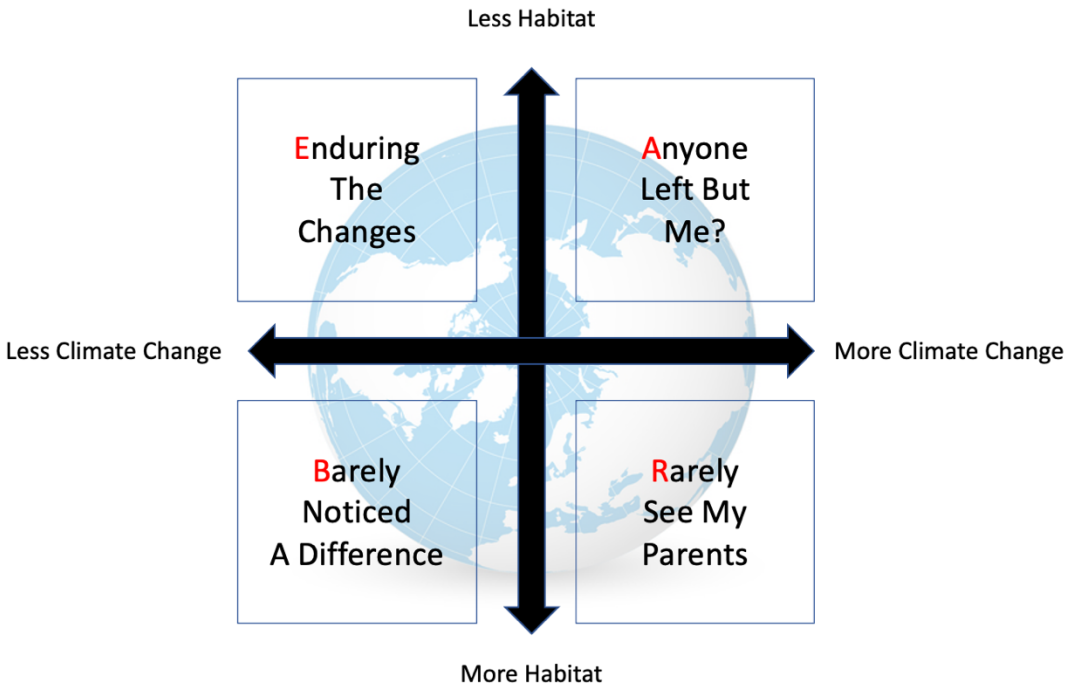
Axes: Climate Change, Habitat

Reasoning: In analyzing the drivers, it became apparent the Environmental category is having the most profound effect on the bears. There remain a lot of uncertainties related to climate change effects in the Arctic. The rate of warming is very high in this region

and the damage being done to these complex ecosystems is very hard to measure and understand, let alone predict with certainty. Climate change and its influence are integral to most if not all the drivers, and therefore become the prime axis.

I concur with the analysis that hybridization and habitat should receive equal rankings from ChatGPT. They are close in a lot of ways, but the habitat is essential to not only the bears' existence, but the increased or decreased separation that results from the amount of habitat is a key element in grizzly-to-polar bear mating. Sufficient habitats are essential to provide necessary shelters for denning and raising bear cubs to maturity along with the availability of prey.

2040 Scenarios



Scenario 1: Barely noticed a difference.

Dr. Marjorie Urso, a research biologist, delivered her 2040 Bears of the Artic findings this morning to international news media sources. From her speech, she noted that "although the land areas and food supply are not as plentiful as they were before the Anthropocene, climate mitigation efforts along with a reduction in human activities in remote areas are aiding in habitat recovery efforts. Recent data shows that both grizzly and polar bear populations have increased since their low point in the early 2020s." She also pointed out that there were no new pizzly sightings. Since the last pizzly sighting occurred in the late 2030s, she assumes that the hybrids from the early part of this century were more of an anomaly than an evolutionary change.

Key features:

- Global concerted climate mitigation efforts are starting to stabilize the crisis.
- Public interests have shifted more resources toward bear conservation.
- Due to diminishing consumer demand, timber, coal, crude oil, and natural gas industries are phasing out production.

Scenario 2: Enduring the changes.

Manuel Oso has been flying the Northwest Territories delivering drilling supplies since he was a boy. Back in 2010, when flew next to his dad, they would sometimes see a sleuth of polar bears going over the islands plus every summer, they would see the grizzlies fishing the river for salmon. Since it became warm in the north most of the year, seeing a bear doesn't happen often and when it does, you hardly ever see more than one or two at a time. Although there was that story last week about one of those

new bears, pizzlies, coming into a small fishing village to forage. The warmer it gets, the more oil they pump out, and if there is money to be made, the bears don't stand a chance.

Key features:

- The climate crisis is getting worse, causing a reduction in bear habitat and food supplies.
- The polar and grizzly bear populations are dwindling.
- The warmer Arctic is making it easier for increased natural gas and oil production.
- Political interests are not aligned with conservation efforts.

Scenario 3: Anyone left but me?

Just after daybreak, Uki leaves her village of Nuiqsut to find bears. After loading her smart drone equipment, she drives about 30 miles inland. No point staying on the coast since no one has seen a polar bear since '35. Uki is searching for the ones who are evolving to survive in the new Arctic normal. The Pizzlies. If it wasn't for the conversation groups, there would be no funding for Uki's research efforts to draw attention to the plight of life in her part of the world. Maybe if she can capture some pizzly video footage to help tell the story of the bears' hardships, just maybe the governments and people will listen.

Key features:

- Advanced technology innovation and deployment can be an effective tool for NGO wildlife research.
- As the climate crisis deepens and habitats are diminished, the possibility of species extinction-level events increases.
- Public perception and sentiment are crucial to increasing government involvement.

Scenario 4: Rarely see my parents.

In the Yukon, there is no better hunting guide for bears than old Mathan Campbell. Hearing Mathan tell it, he has been hunting them since way back in the 1990s. He has killed polar bears, grizzly bears, and even those new bears, pizzlies. The polar and grizzly bears need special permits because they are protected (what's left of them), but those pizzlies? The government hasn't put any restrictions on hunting them. Old Mathan says that city people just don't care about the bears. If you want a trophy Pizzly, he knows where to find them.

Key features:

- Polar and grizzly bear populations are regulated or hunting. Hybrids like the Pizzly have not been recognized as species and therefore they are not regulated like their parents.
- Hybridization can lead to a more evolved species better suited to the current conditions. With limited resources, they can replace their parents.

- Public interest in wildlife, especially in urban areas, is essential to wildlife conservation.

Implications

	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Strengths	Sufficient level of qualified resources to meet growing demands.	Habitat area projects have been successful in keeping sufficient levels to have bear populations.	Technology, especially AI-enabled, can be a powerful research tool. Citizen scientists can help reduce overhead research costs.	PR can run a new public awareness campaign focused on the novelty of the Pizzly.
Weaknesses	No formal research on possible Pizzly populations.	Lack of political lobbying success on industry effects to maintain bear populations.	Bear habitats are unsatisfactory to maintain bear populations. Paid research professionals are not up to proper staffing levels.	Lack of international cooperative legislation to protect the hybrid Pizzlies.
Opportunities	Strong public support can produce additional funding.	Air cargo pilots could be enlisted as aerial spotters. Local stories like Manuel's could generate renewed interest in the bears.	Stories related to the citizen scientists' efforts in saving the last of the great bears may help with funding, participation, and possibly staffing. Technology companies may sponsor activities for using their products.	Hunters have a long history supporting animal and habitat conservation efforts. Bear DNA incentive program for hunters to provide samples along with pertinent kill-related information.
Threats	Opinions, even expert ones, can have negative repercussions. The climate crisis is damaging habitats.	Habitat efforts are not producing the needed results.	Like the parents, extinction-level events may also apply to the hybrids.	No government regulations regarding Pizzly hunting.

The appearance of the pizzly serves as yet another troubling indicator of the Anthropocene's unintended effects on nature. Their true population numbers remain a mystery along with their effects on habitats, food supplies, and future generations of their parents. At present, there does not seem to be sufficient international interest in the pizzly to warrant extensive research funding and since the governmental interests may lie with the economics of the Arctic-based industries, such research may be detrimental to those economic interests. With the lack of significant progress on the climate crisis, habitat mitigation efforts face an ever-increasing daunting task.

The role of the NGOs like the World Wildlife Fund and Vital Ground is increasingly important to avert an extinction-level event for polar and grizzly bears along with protecting the hybrid pizzlies. To accomplish their missions, NGOs must expand efforts on habitat initiatives, ensuring bear populations have sufficient land and food resources to mate, raise their young, and thrive. Those efforts will need to conduct more research, which should consider using citizen scientists working in collaboration with professional researchers to conduct mission-critical studies on all bears, including the pizzly. The latest smart technologies need to be deployed to the field to give researchers the necessary tools to be effective in understanding and monitoring bear populations.

The pizzly presents a unique opportunity for NGOs. Its novelty can excite new interests in the Arctic, its habitats, and wildlife. Public interest generated by the pizzly can increase donation-related funding activities, inspire greater participation, and serve as a “poster child” in public media campaigns on the status of the Arctic. The pizzly can draw attention to industrial exploitation of its habitats and the lack of governmental protections for this very rare species can spur new political activism.

The pizzly is another manifestation of our continued irreverence for the natural world. However, this living unintended consequence can serve as an ambassador for new species, advocating for humans to create a new future where all life thrives.

References

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