



# The polar bear deterrence toolbox - innovations



Femke Hilderink, WWF NL  
CAFF Conference 2018

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# Toolbox to enhance safety



© B. Hansen (govt. Nunavut, dept. of environment)



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U.S. Fish & Wildlife Service

## Polar Bears and Humans Safety Guidelines

Polar bear density in Alaska is highest during fall months when polar bears aggregate along the coastline. Due to changing ice conditions the U.S. Fish and Wildlife Service (FWS) anticipates that polar bear use of the coast will increase during open-water seasons (June through November). During this time many villagers engage in subsistence activities, and more people are becoming interested in polar bear viewing opportunities. Increasing numbers of visitors to Barrow and Kaktovik to view polar bears increases potential interactions between humans and polar bears. Polar bears are naturally curious and predatory which are factors that increase risk to humans.

We encourage people to avoid polar bears. The purpose of these guidelines is to minimize polar bear-human interactions and maximize the safety of both humans and polar bears, so each can continue to live safely in the Arctic environment.

### Federal Law Regarding Polar bear-Human Interactions

Polar bears are protected under the Marine Mammal Protection Act (MMPA) which prohibits take and harassment of any marine mammal.

Take is defined under the MMPA as: "to harass, hunt, capture, or kill, or attempt to harass, hunt, capture, or kill any marine mammal." This includes feeding or attempting to feed a marine mammal in the wild.

**Level A Harassment** is: any act of pursuit, torment, or annoyance which has the potential to injure a polar bear.

**Level B Harassment** is defined as: any act of pursuit, torment, or annoyance which has the potential to disturb a polar bear by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering.

This means that any change in the polar bear's natural behavior that is a result of your presence in proximity to the animal

can be considered level B harassment and is unlawful.

Some exceptions are:

- Take for subsistence purposes, as long as take is not wasteful. The hunter is required to have the hide and skull tagged within 30 days. Harvest taggers are located in coastal villages to help.
- Authorized harassment of bears (disturbance) by government officials (i.e. North Slope Borough Polar Bear Patrol) is permissible as long as it is done in a humane manner and is for the purposes of protection or welfare of the bear, the public, or non-lethal removal of nuisance animals that pose a risk to public safety.
- Defense of life take is only permissible if such taking is immediately necessary in self defense or to save the life of a person in immediate danger, and such taking is reported to FWS within 48 hours. Public officials have the authority to use lethal methods to protect the public from polar bears, and may do so when all reasonable steps to avoid killing the bear(s) have been taken.
- Scientific research such as polar bear population surveys, ecology



studies etc. can be authorized.

■ Photographing polar bears in the wild is permissible if no take occurs. If such activity is for educational or commercial purposes and could result in Level B harassment (disturbance), a permit is required.

■ Polar bears are also listed as a "threatened" species under the Endangered Species Act. This designation does not alter the definitions or exceptions of take outlined above under the MMPA.

### Guidelines for Living in Polar Bear Country

Most polar bears avoid people and have historically inflicted few human injuries and fatalities. However, the combination of curious and occasional sudden aggressive behavior creates the potential for human injury. In addition, polar bears spending extended periods of time on land without an adequate food source may be nutritionally stressed animals and potentially more dangerous.

Polar bears are predators and should always be treated as dangerous; their behavior includes an element of unpredictability. In general, polar bears will react to humans by avoiding them, exhibiting curious behavior, treating them as other bears, or attempting to prey on them. The closer that humans are to polar

# Innovation

North Slope Borough's Department of Wildlife Management, North Slope Borough  
CIPM Department, City of Kaktovik, WWF US

Attractant management  
Bear safe containers



Regular waste bin



Initial test design



# Innovation

North Slope Borough's Department of Wildlife Management, North Slope Borough  
CIPM Department, City of Kaktovik, WWF US

Attractant management  
Bear safe containers



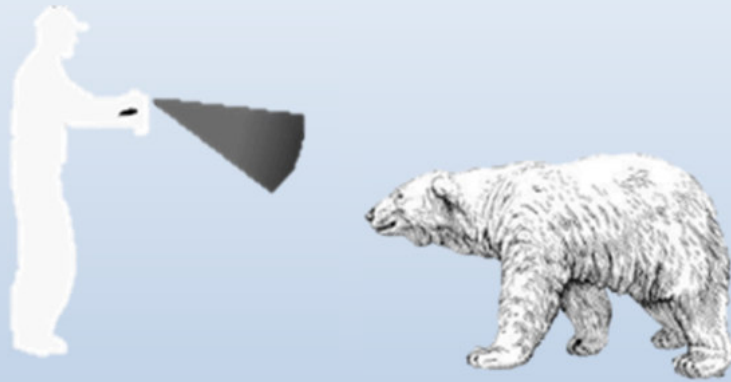
## Design:

- Easy access to dump garbage
- Stainless steel
- Collapsible design, assembly on site
- Pressure release lock design (automatic when emptied)

# Innovation

Polar Bear Range States' Conflict Working Group: James Wilder, Tom Smith,  
Geoffrey York, Martyn Obbard

Safety measures  
Bear spray



Study to test the validity of the three most common concerns regarding the use of bear spray as a tool for polar bear deterrence:

1. Bear spray is ineffective on polar bears
2. Cold temperatures will render it useless
3. Strong winds will make it ineffective



© Wilder et al.



© Wilder et al.

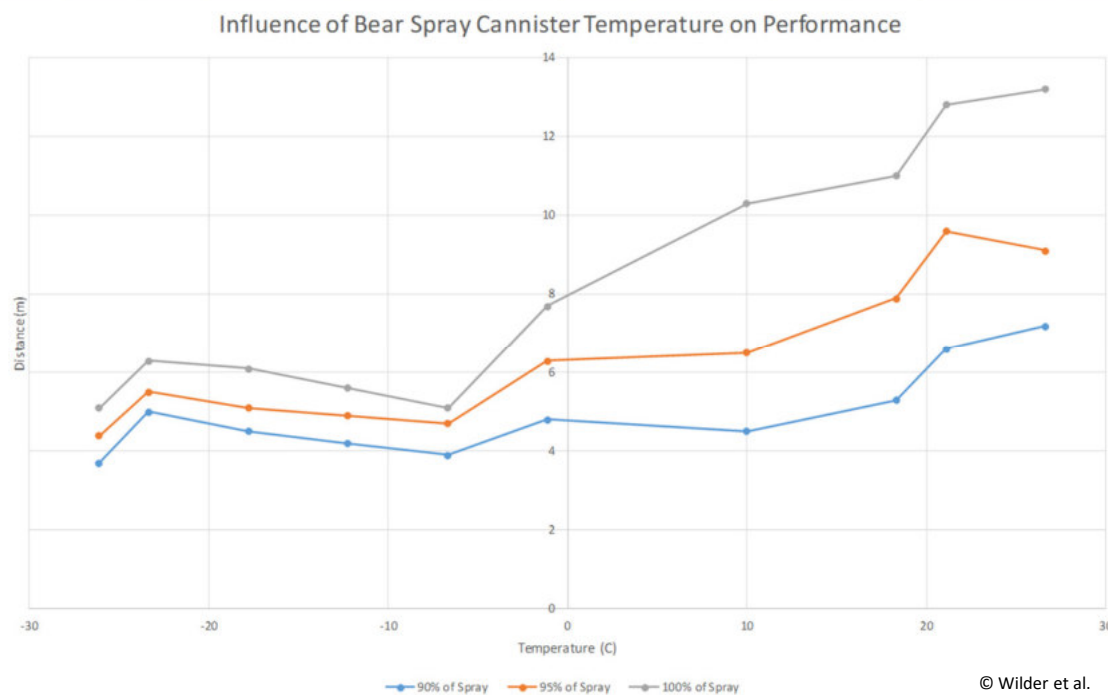
# Innovation

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Geoffrey York, Martyn Obbard

Safety measures  
Bear spray

## Results

- 94% effective in 17 cases studied
- Temperature: -23 °C: spray stills reached 4 meters
- Wind: minor impacts recorded on user



# Innovation

Polar Bears International, Hogle Zoo, NANA Management Services,  
Town of Churchill, Manitoba Sustainable Development

Early warning system  
Radar surveillance

**Compact Radar Surveillance**  
SpotterRF C40D radar

Canon PTZ camera



Alarms triggered by object size and movement parameters

Visual or IR camera follows objects identified + display on google map

Sensitive to human-sized targets to 400 meters, all weather conditions, day and night



# Innovation

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Radar surveillance



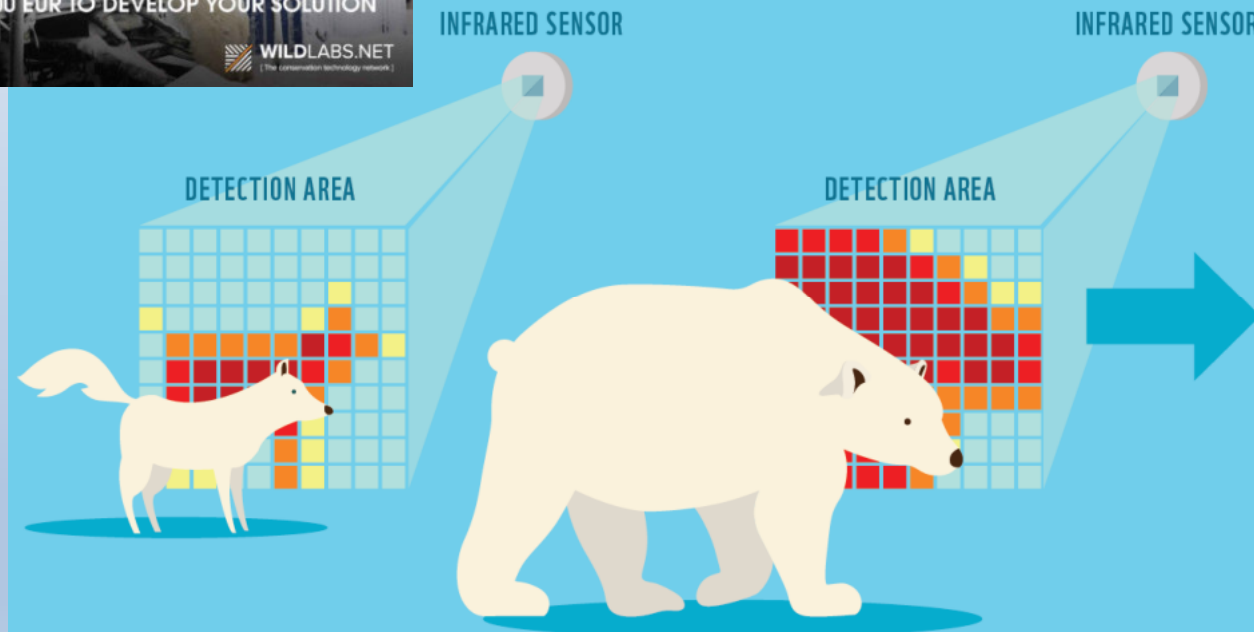
- In the future, olfactory, visual, and sound based deterrents
- Radar data to examine local habitat use by bears in bear viewing zone



# Innovation

Arribada Initiative, WWF, WILDLABS, municipality of Ittoqqortoormitt

Early warning system  
Thermopile technology



## Results from thermopile PIR sensor



## Pros and cons

- ✓ Identify species
- ✓ Work in poor light
- ✓ Cost effective
- ✓ **Notify** in real-time

ULIS Micro80 Gen2 shutter-less microbolometer selected for Arctic conditions

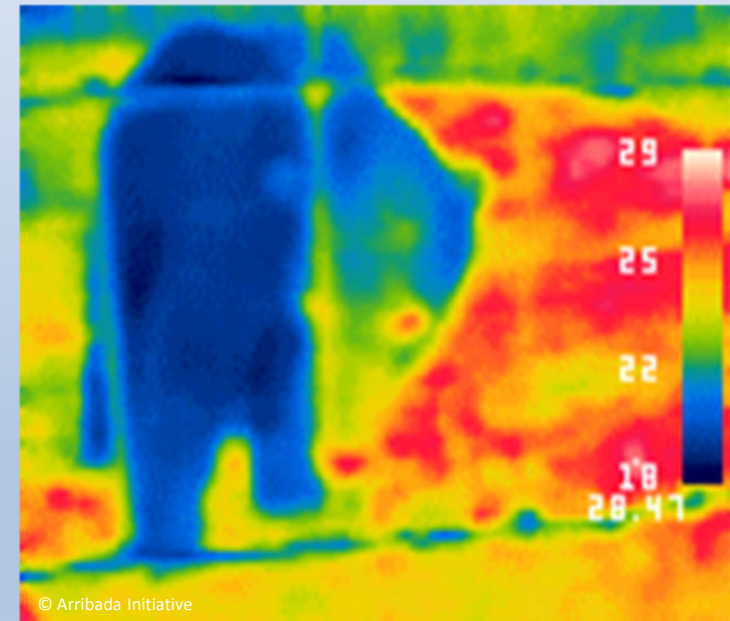
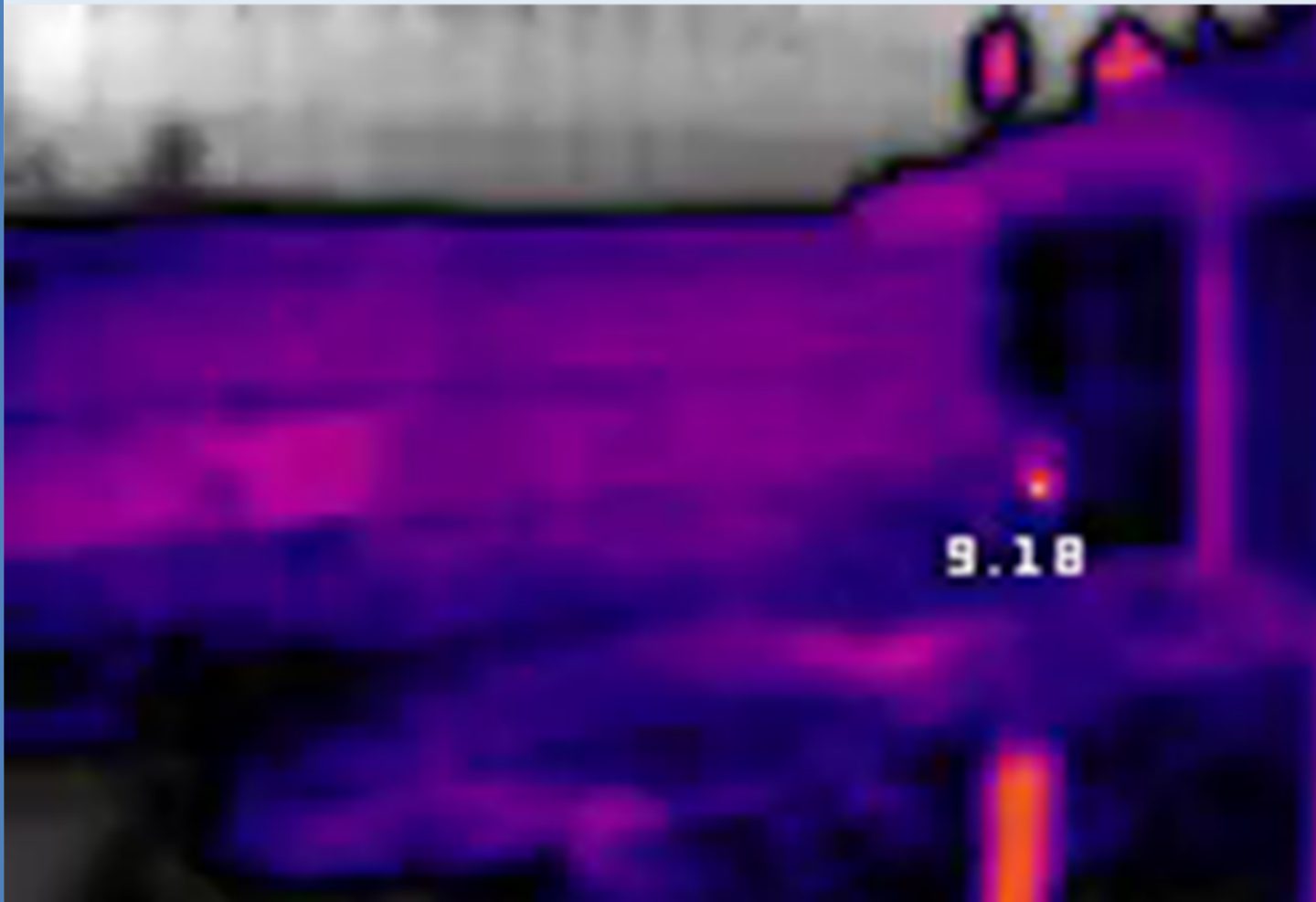


© Arribada Initiative

# Innovation

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Early warning system  
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# Challenges

Waste dumps – expensive to protect from bears

Arctic conditions – snow, wind, extreme cold, etc.

Bear biology and behaviour – well insulated, curious, etc.

Smells - will always continue attract bears, hard to contain

Upscaling of technology after testing and implementation – making it available to people





# Conclusions

Technology can help improve conflict management, not replace any approaches

Need for social, environmental and economic acceptability

Still a lot to learn and develop, adapt to local circumstances

People should regard tech as assistance, not something to fully rely on!





## Towards safe communities and bears!



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