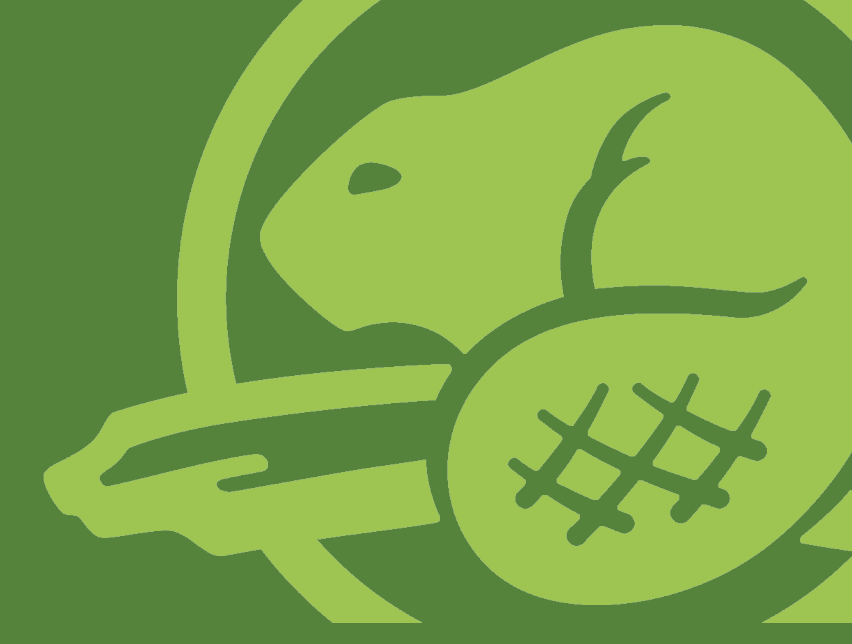


Assessing the risk of non-motorized watercraft as a vector for spread of aquatic invasive species in the mountain national parks

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BACKGROUND

Aquatic invasive species (AIS) are increasing their range throughout North America. AIS are introduced naturally or, more commonly, through human activities. Once established they can alter aquatic ecosystems, threaten native species, impact visitors' experience of the parks and damage infrastructure. Preventing the introduction of AIS is the most effective way to avoid and manage potentially devastating impacts.

AIS prevention programs in the west have typically focused on motorized watercraft, given their higher complexity and higher level of risk for transporting AIS. However, access to motorized watercraft is limited to a handful of lakes in the mountain national parks, while non-motorized watercraft is seemingly at an all time high. While the risk of motorized watercraft is higher, the sheer volume of non-motorized watercraft moving around in protected areas requires further consideration.

The mountain national parks sit atop the headwaters of five major watersheds leading to three oceans, often just a few kilometers apart. Five of the mountain national parks (Jasper, Banff, Yoho, Kootenay and Waterton Lakes National parks) in western Canada are collaborating on the development and implementation of an AIS Strategy. A major component of which is prevention. Information collected from the AIS prevention permitting will fill the knowledge gap on the risk and lead to more informed, data driven management decisions for future AIS prevention programs.

AIS PREVENTION PERMITTING

The mountain national parks have developed and initiated a **mandatory** permitting system for use of watercraft in park waterbodies as part of the Aquatic Invasive Species (AIS) Prevention Program. Each of the mountain national parks have unique challenges and operations and so AIS prevention is not a one-size-fits-all scenario. The Prevention Program has been developed to allow for operational flexibility, while maintaining consistency across parks. A key component of the Prevention Program is the restriction of the use of motorized and non-motorized watercraft and/or water related gear through the implementation of *Restricted Activity Orders* to the holders of valid *AIS Prevention Permits*. There are three ways to obtain an *AIS Prevention Permit*: a staffed inspection, a self-certification, or seasonal. The type of permit accepted is dependent on watercraft type and is specific to each field unit (Figure 1, Table 1).

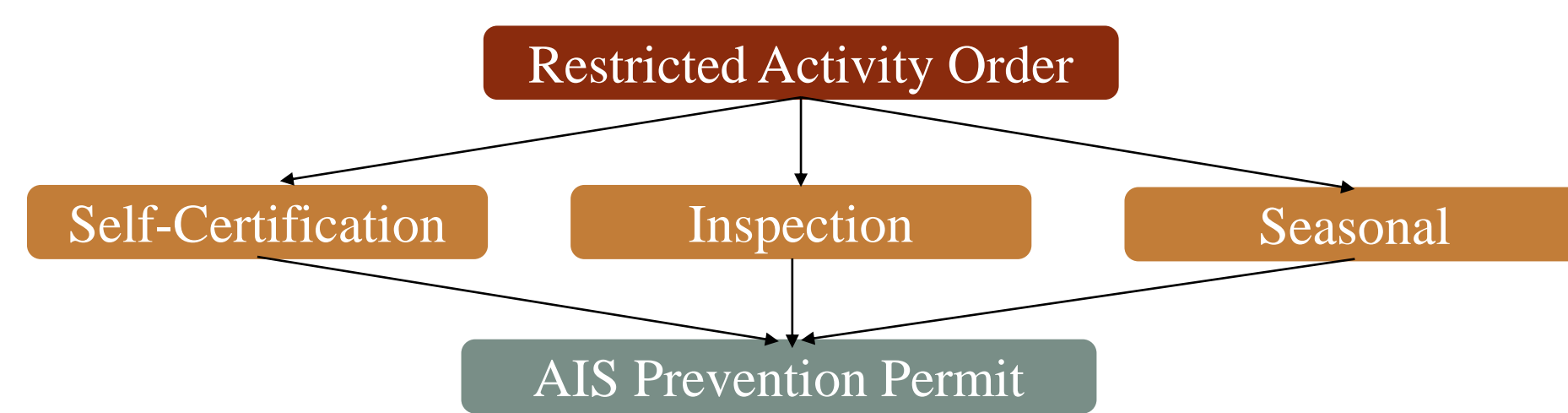


Table 1. AIS Prevention Permit type required in each park by type of equipment.

| | Yoho/Kootenay | Banff | Waterton |
|---------------------------|----------------------------------|----------------------------------|--------------------|
| Motorized | N/A | Inspection | Quarantine |
| Non-motorized | Inspection Or Self-Certification | Inspection Or Self-Certification | Inspection |
| Water-related gear | Inspection Or Self-Certification | Inspection Or Self-Certification | Self-Certification |

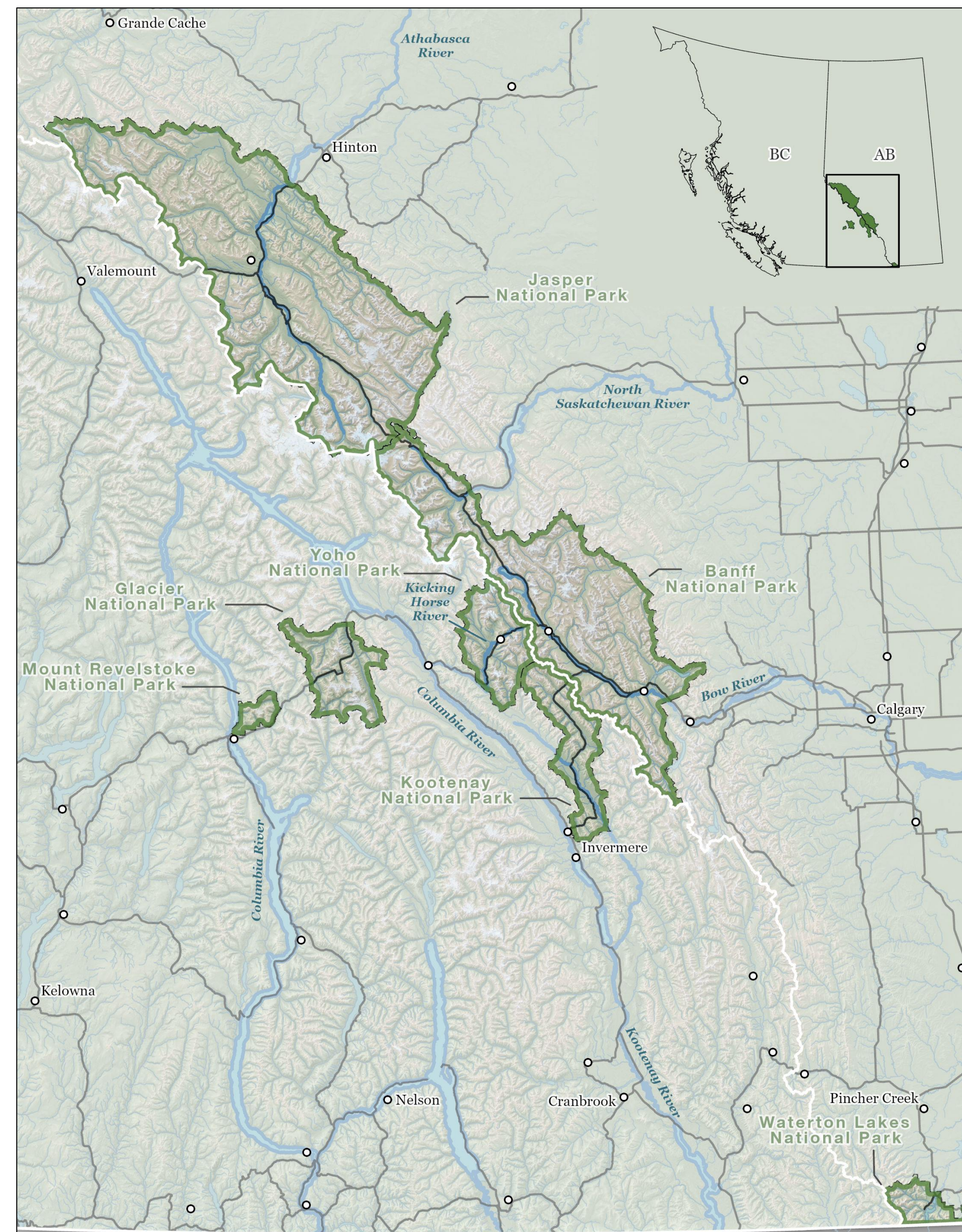


Figure 2. Map of the mountain national parks; containing the headwaters of several major watersheds including Columbia, Kootenay, Bow, North Saskatchewan and Athabasca rivers. In some areas, the distance between watersheds flowing into two separate oceans are just kilometers apart. Note: Jasper National Park will be running a pilot AIS Permitting Program in 2023.



Figure 3. AIS Prevention Self-certification Permit kiosk at a lakeshore in Banff National Park.



Figure 4. AIS inspection staff performing a hot wash on a canoe that failed an inspection. The visitor will be issued a permit once the hotwash is complete.

2022 INSPECTION STATION DATA

An assessment of the risk of non-motorized watercraft was conducted using data from the inspection stations

A watercraft was assessed as high risk if:

- The location of last use was a province or state with known zebra mussel populations (figure 4);
- The watercraft failed the inspection (figure 5, i.e., was clean drain dry).

In Banff, Yoho and Kootenay national parks, 28 – 29% of non-motorized watercraft that visited inspection stations were last used at a location with known zebra mussels. In contrast, <1% of motorized watercraft that visited the inspection station in Banff National Park were categorized as such.

In Banff, Yoho and Kootenay national parks, over half of the non-motorized watercraft that visited the stations failed the inspection due to the presence of mud, standing water, plant or animal material. In contrast, 14% of motorized watercraft failed inspections.

In Banff, Yoho and Kootenay, non-motorized watercraft users are not getting the message to clean, drain and dry.

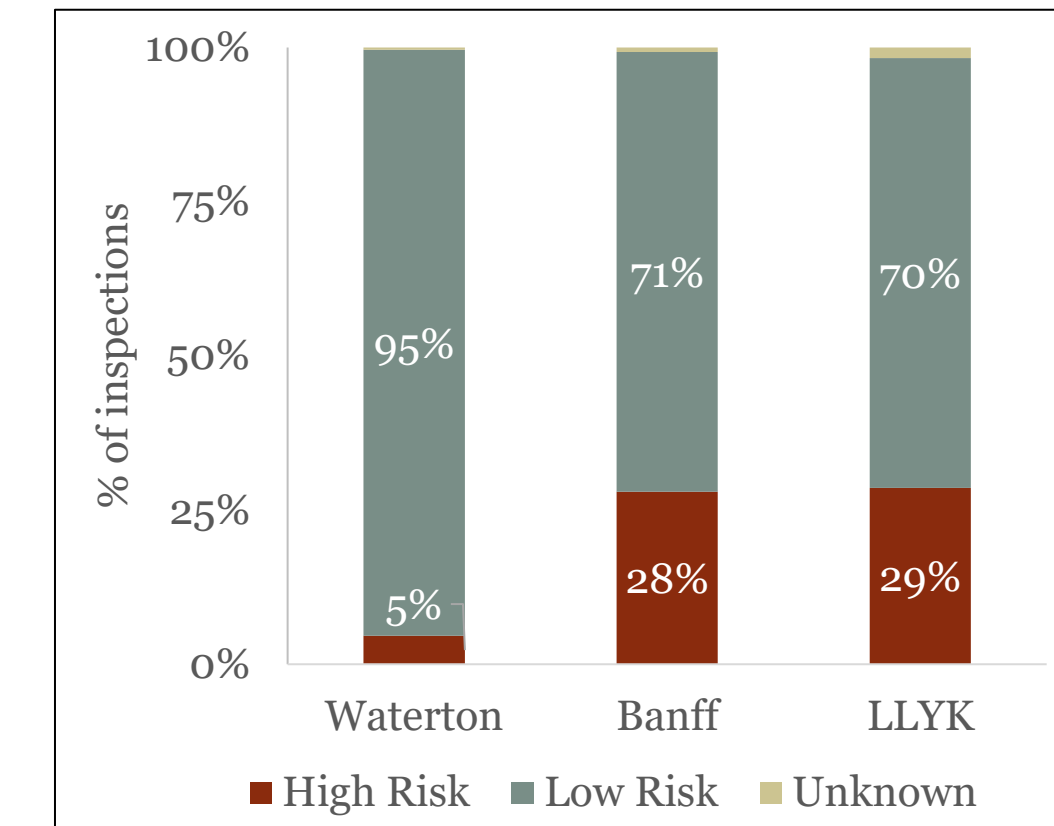


Figure 4. % of non-motorized watercraft last used in a location with zebra mussels. LLYK = Lake Louise, Yoho and Kootenay field unit.

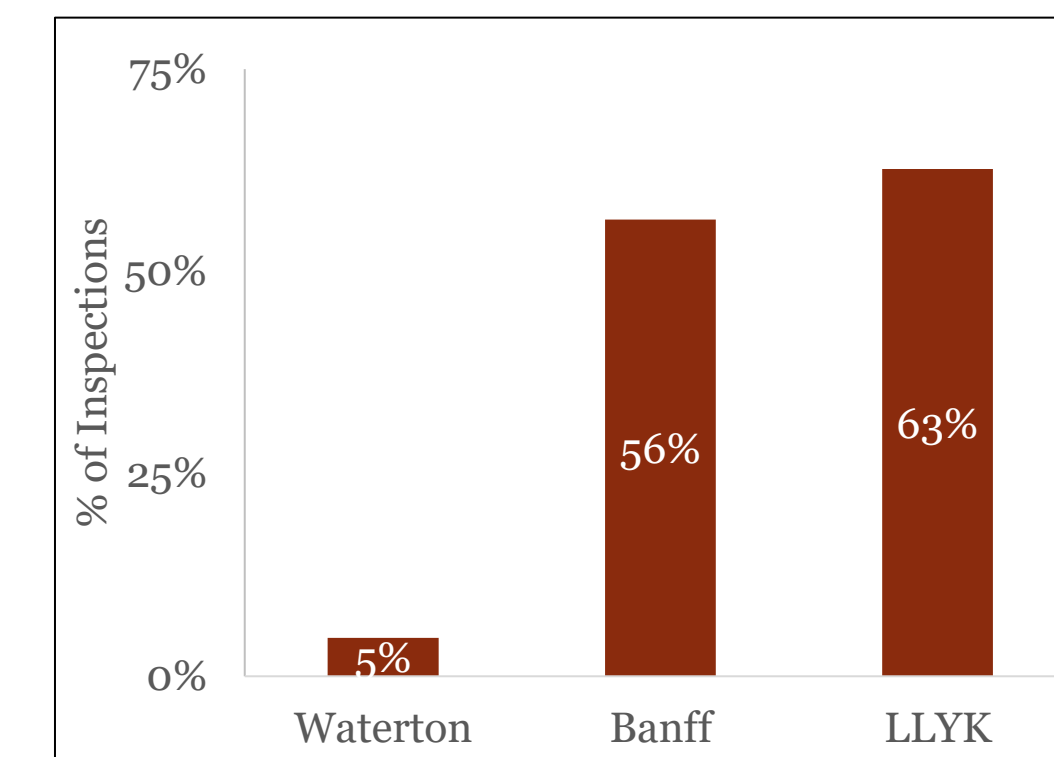


Figure 5. % of non-motorized watercraft that failed an inspection due to the presence of mud, water, plant or animal material. Failed inspections resulted in a hot wash, decontamination or non-issuance of permit. LLYK = Lake Louise, Yoho and Kootenay Field Unit.

SUMMARY

An estimate of the total number of non-motorized watercraft in each park in 2022 was calculated based on estimated compliance levels (41 – 53%) and overall number of AIS Prevention Permits issued (Figure 6). It was estimated that each field unit or park had several thousand non-motorized watercraft without permits enter waterbodies. In contrast, an estimated 780 motorized boats visited Banff National Park in 2022, an estimated 150 without permits.

It is well understood that motorized watercraft pose a higher risk to transporting AIS due to a higher complexity. However, results from one year of the AIS Prevention Permitting Program clearly show that the greater mobility and much greater volume of non-motorized watercraft increase the risk of introducing or spreading AIS in an the sensitive, geographically critical area.

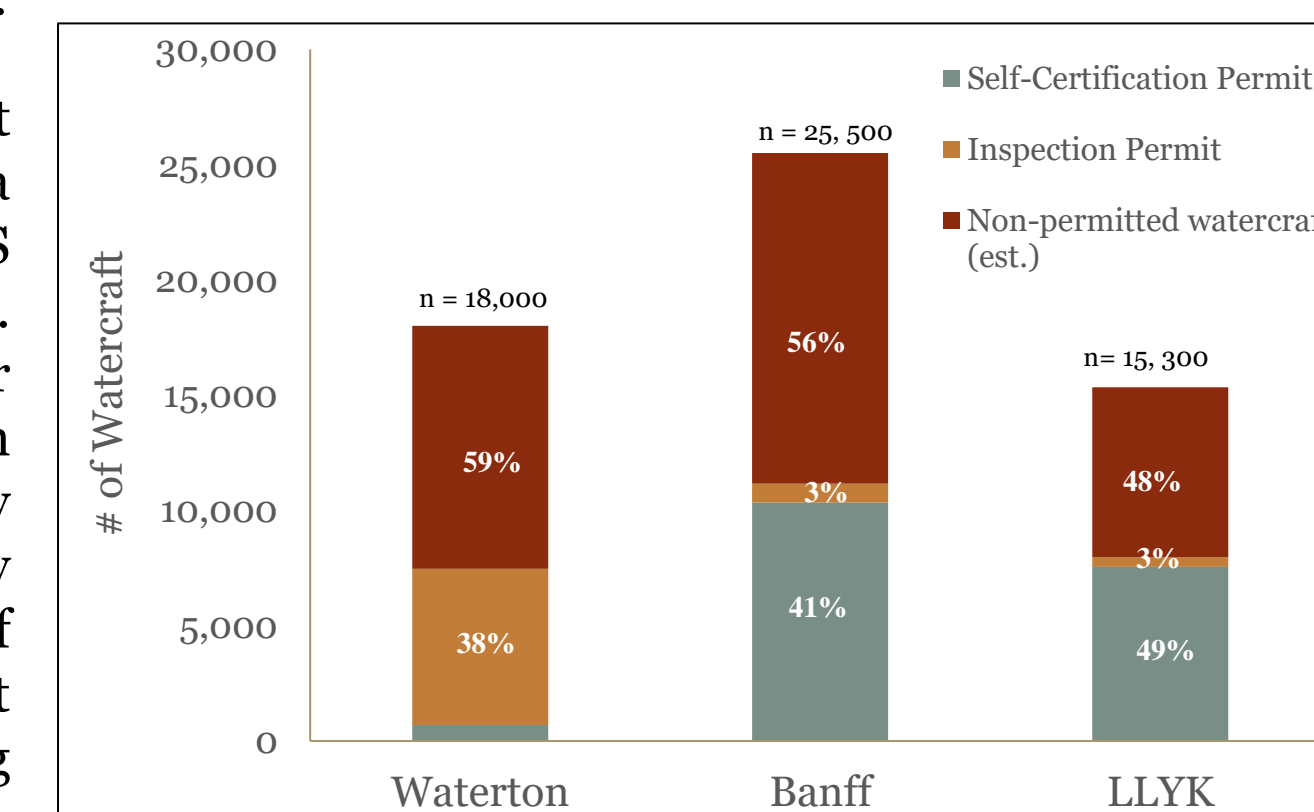


Figure 6. Estimated total number of non-motorized watercraft in each park (or field unit) based on compliance estimates and number of permits issued.