

Check Clean Dry: Biosecurity best practice

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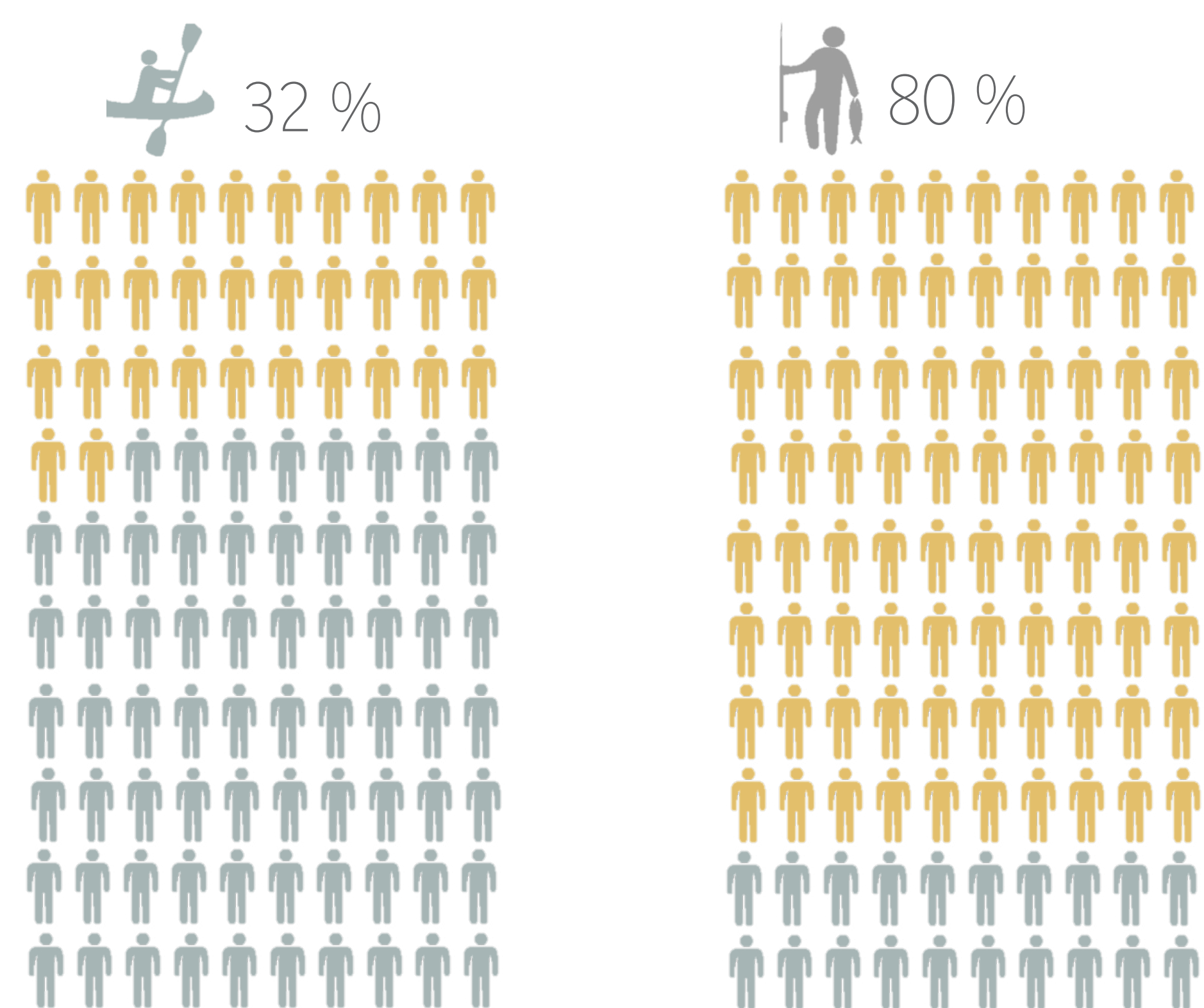
Invasive non native species (INNS) pose an enormous threat to biodiversity and cost the UK economy almost £2 bn pa. Seven out of ten of the Environment Agency's 'Most Wanted' INNS are aquatic species. As many aquatic INNS can survive in damp conditions for several days or weeks, they may be inadvertently moved between waterways on the equipment used by anglers and canoeists. In 2010, Defra launched the *Check Clean Dry* biosecurity campaign to encourage water users to check, clean and dry their kit after use to prevent any accidental INNS spread. Here, we demonstrate the effectiveness of hot water as a simple, cost effective and environmentally sound method by which these groups can 'clean' their kit.

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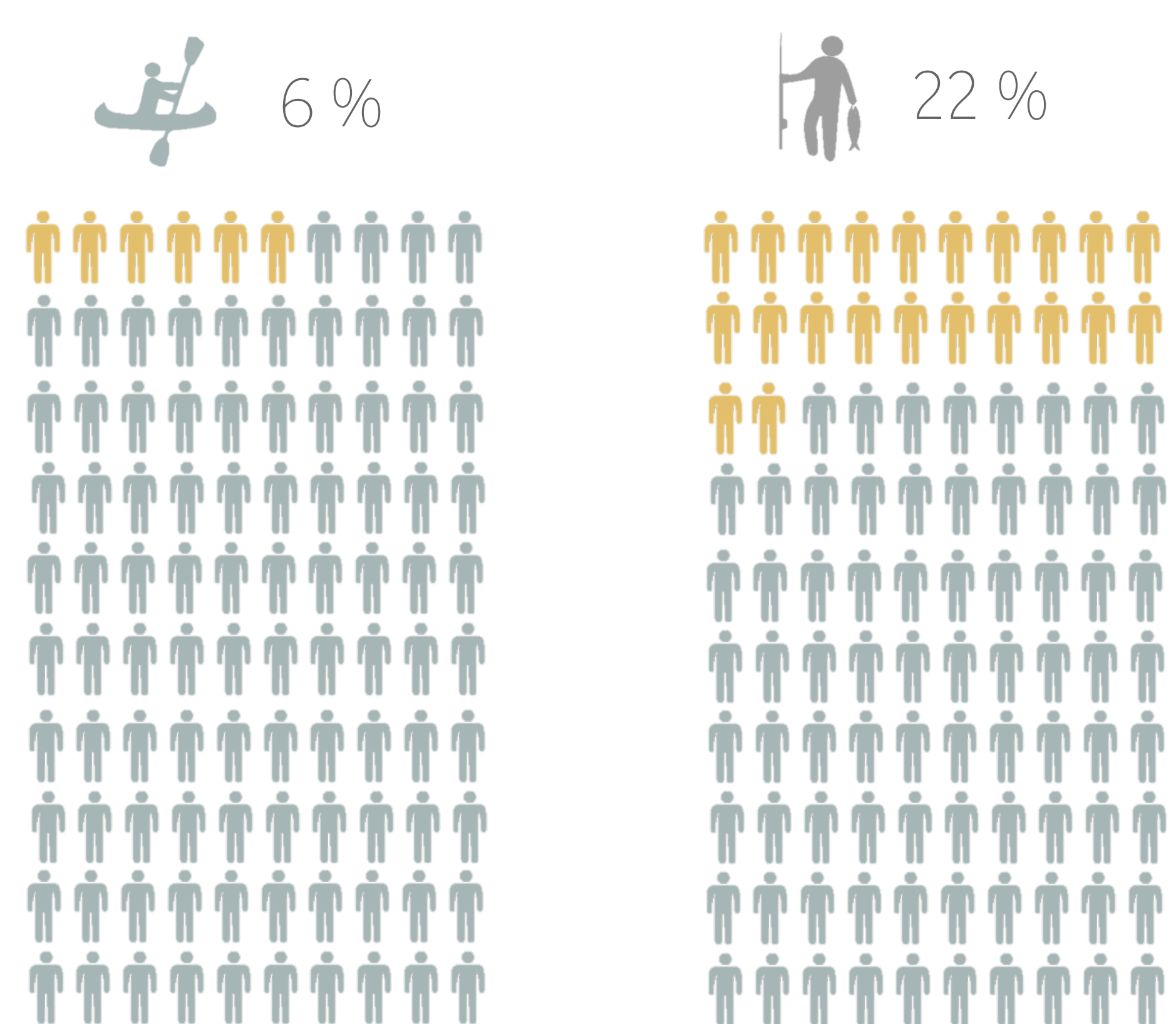
Movement patterns

Questionnaires were conducted with 960 anglers and 599 canoeists to determine how frequently they moved between sites; how frequently they took any biosecurity actions; and if they had heard of *Check Clean Dry*. Our results indicated that 64% of anglers and 79% of anglers visit >1 site within a fortnight. Of those:

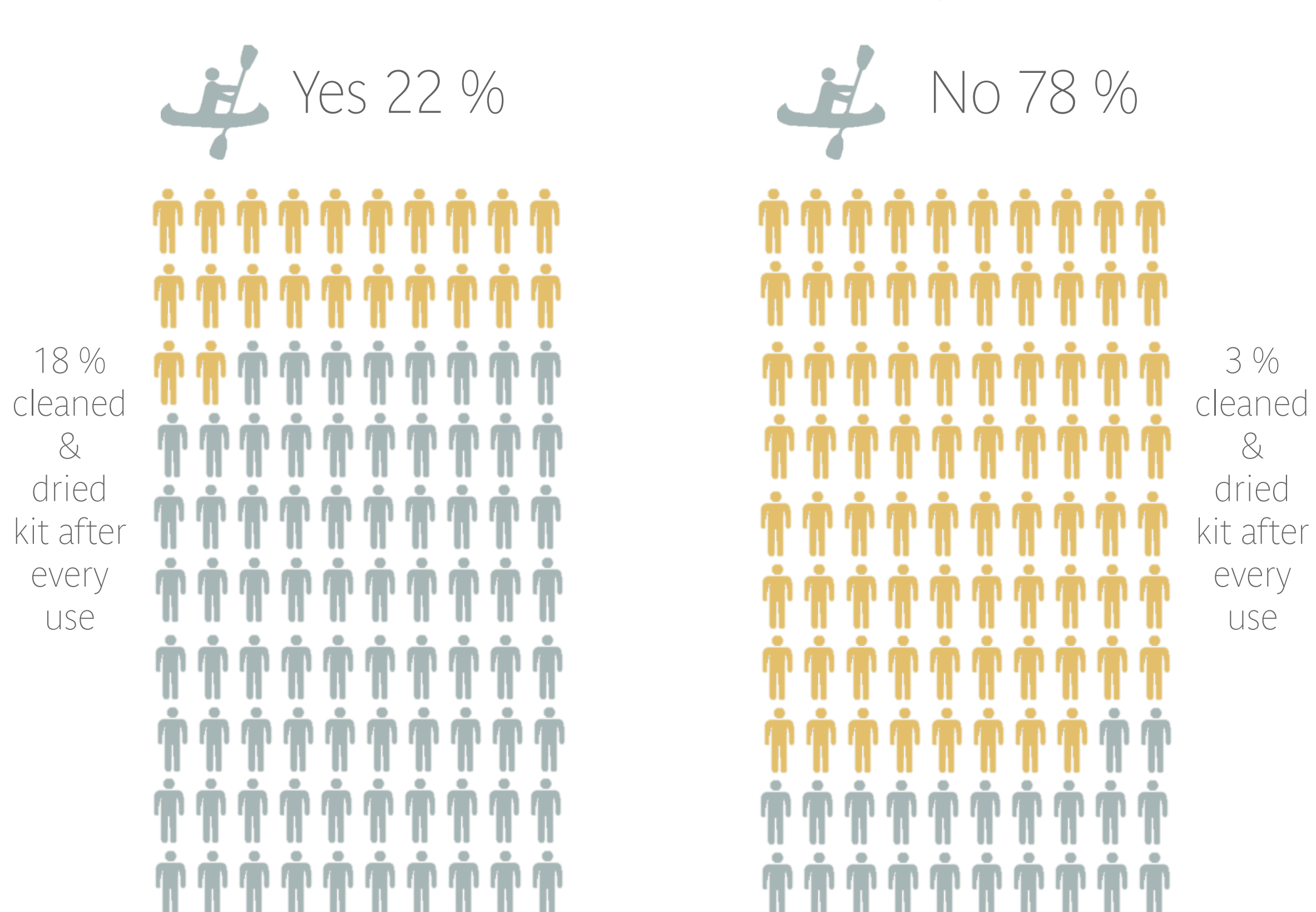
% Drying kit after every use



% Cleaning kit after every use



% Heard of Check Clean Dry



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Decontamination

AIM: To test whether hot water (submersion at 45°C for 15 minutes) was effective at killing high impact aquatic INNS on angling equipment



NZ PIGMYWEED *Crassula helmsii* (CH)
FLOATING PENNYWORT *Hydrocotyle ranunculoides* (HR)
CURLY WATER THYME *Lagarosiphon major* (LM)
PARROT'S FEATHER *Myriophyllum aquaticum* (MA)



BLOODY RED SHRIMP *Hemimysis anomala* (HA)
KILLER SHRIMP *Dikerogammarus villosus* (DV)
ZEBRA MUSSEL *Dreissena polymorpha* (DP)

Approach

- Each animal/plant fragment was placed in a 50mm x 50mm mesh bag constructed from a keep net and submerged in dechlorinated water for 1 hour to saturate the net.
- Animals/plants were then subjected to one of four treatments (60 per species per treatment): 1) hot water (45°C for 15 minutes) 2) hot water followed by drying; 3) drying only; 4) control (nets kept damp).
- Animals/plants were recorded as alive/dead at six time points after the initial treatment: 1 hour, 24 hours, 48 hours, 4 days, 8 days, and 16 days.

Key Results

- Hot water caused 99% mortality across all species 1 hour after treatment
- Drying caused 90% mortality 7.5 days after treatment
- All species except *H. anomala* survived for 16 days when left untreated in damp conditions (control) demonstrating potential for survival on equipment between sites

