

Impacts of Visitor Experience and Knowledge on Landscape Preferences: The Case of the Bark Beetle

Ingrid Schneider, Ph.D., UMN ■ Ami Choi, Graduate Research Assistant, UMN ■ Arne Arnberger, Ph.D., BOKU, Austria ■ Martin Ebenberger, BOKU, Austria
Paul Gobster, Ph.D. & Stephanie Snyder, Ph.D., USDA Forest Service ■ Stuart Cottrell, Ph.D., Colorado State University ■ Robert Venette, Ph. D., USDA Forest Service

Background

- The extensive spread of forest pests is one of the major global environmental tribulations in the 21st century (Daab & Flint, 2010). Mountain pine beetle (*Dendroctonus ponderosae*) in North America and the spruce bark beetle (*Ips typographus*) in Europe have caused large-scale disturbances to parks and protected areas (Müller, Bussler, Gossner, Rettelbach, & Duelli, 2008).
- Forest insect infestation significantly alters landscapes (Qin, Flint, & Luloff, 2015) and may constrain outdoor recreation & nature-based tourists in site choices, site enjoyment & return visits.
- Little is known about visitor response to visual changes in forest recreation settings & how visitor preferences may vary depending on their past experience & knowledge.

Purpose: To explore if & how visitor knowledge & experience in infested-areas differentiated landscape preferences in park & protected areas.

Methods

Survey On-site, 4 pages

Knowledge ordinal scale (see Figure 1)

Experience dichotomous (see Figure 3)

Landscape preferences: Visitors selected from groups of 4 digitally calibrated images that simulated forest stands with varying levels of bark beetle outbreaks, management practices, visitor use levels & visitor composition (below)

Sample Visitors to protected areas, summer 2013: n= 636

Bemidji State Park in Minnesota (n=228)

State Forest State Park in Colorado (n=200)

Harz National Park in Germany (n=208)

Analysis Discrete choice experiments, 6 attributes, Latent Gold software



Results

Visitors knowledge of bark beetle varied (Figure 1). The majority of visitors had heard of the beetle..

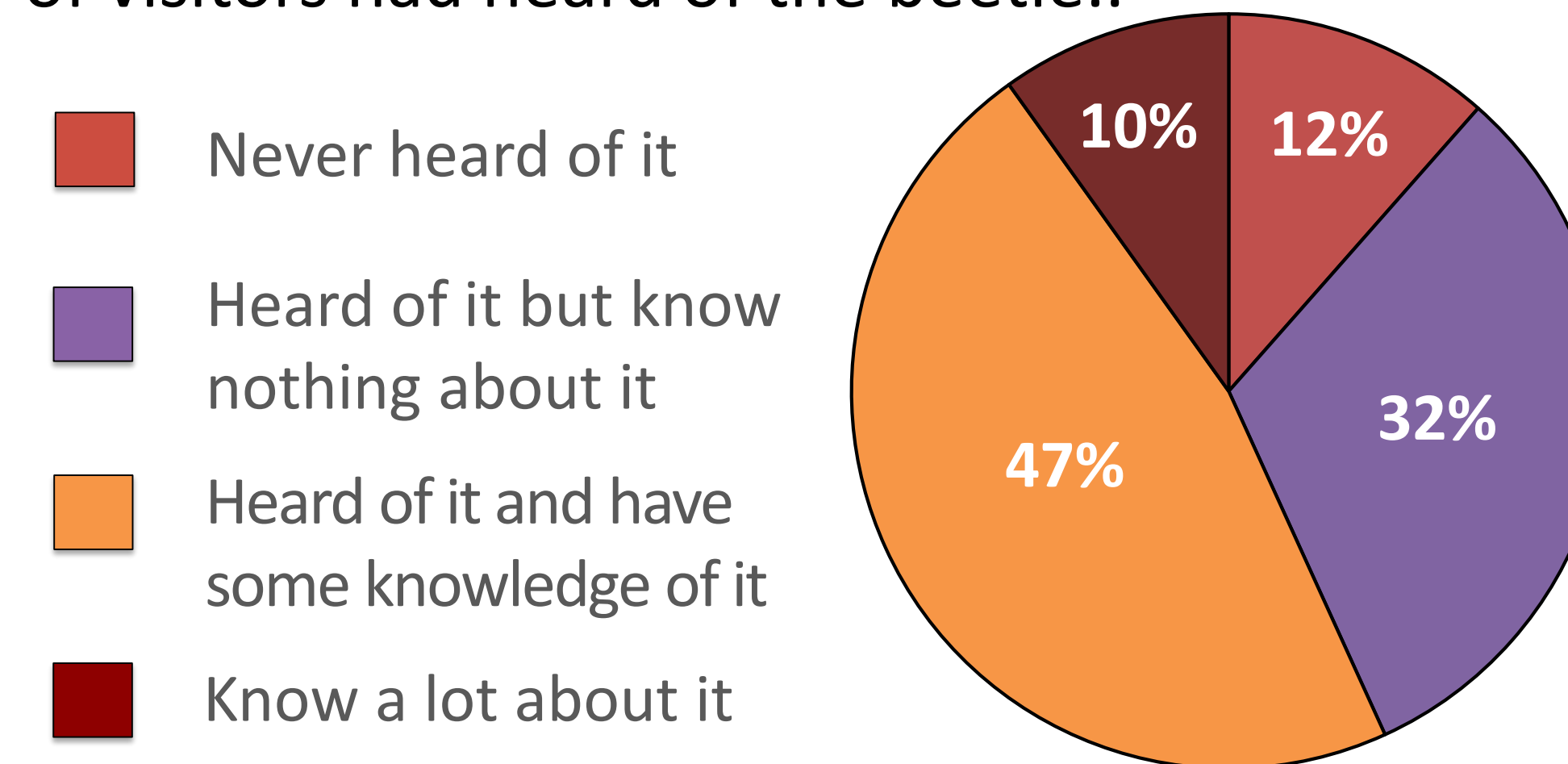


Figure 1: Visitor knowledge about bark beetle (n=636)

Knowledge differentiated preferences for only 1 of 6 attributes studied: “forest landscape in the foreground”. Those with any knowledge revealed lower preference for natural compared to mono-cultural forests and showed a strong dislike of dead wood but were more positive regarding first signs of beetle damage (Figure 2).

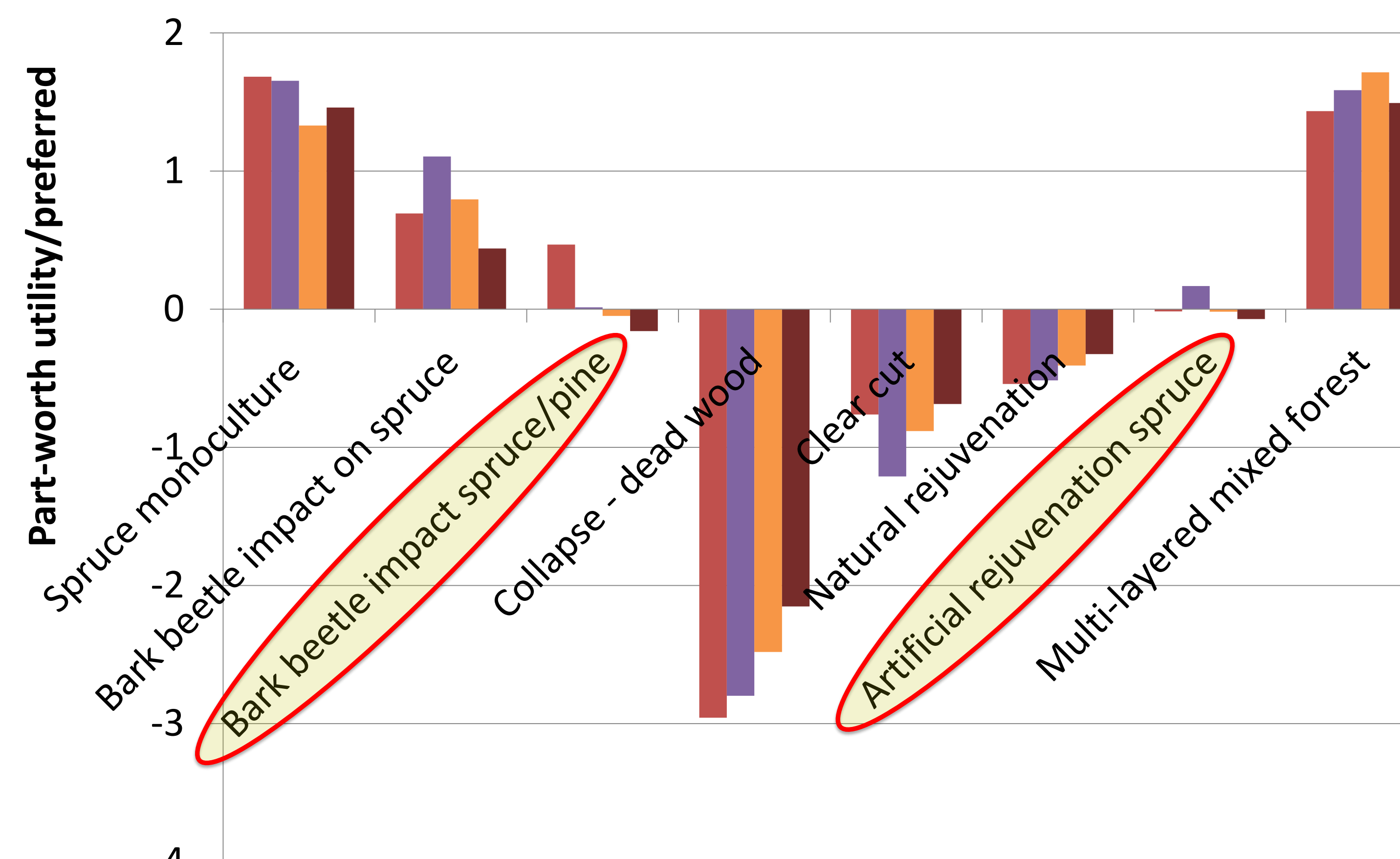


Figure 2. Differences in preferred forest fore-ground by level of bark beetle knowledge (n=636)

The majority of visitors had **experience in impacted areas**, although about 1 in 5 were unsure of their experience (Figure 3).

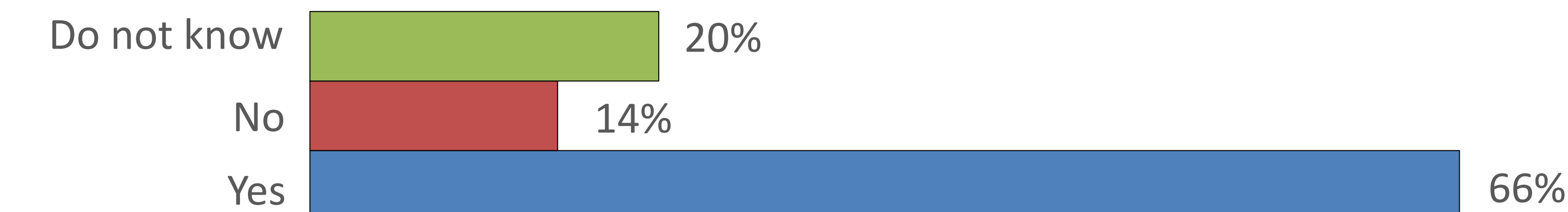
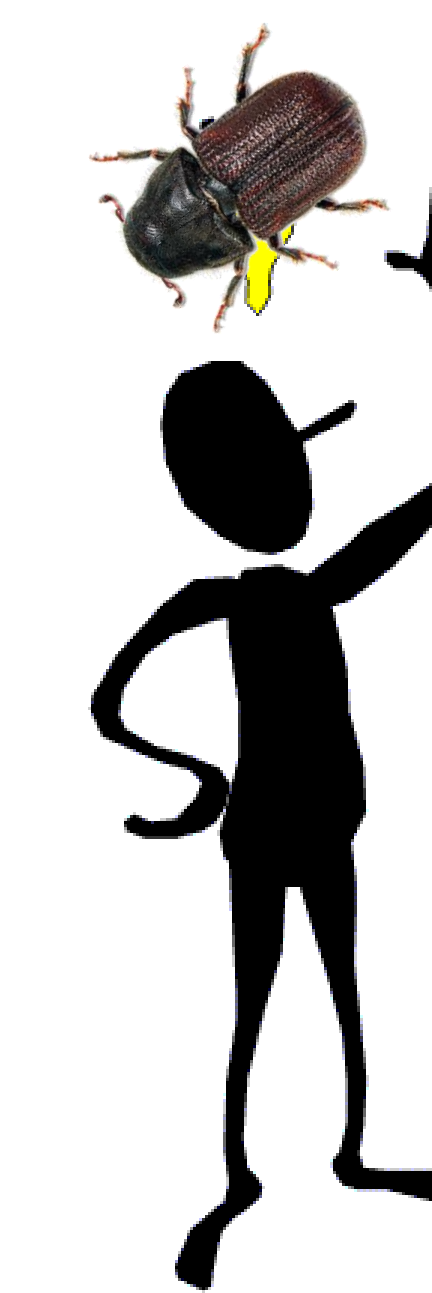


Figure 3. Visitor experience in recreation areas visually impacted by forest pests (n=636)

Experience in pest-infected areas differentiated preferences in 5 of 6 attributes studied: only forest-background did not differ. Visitors with > experience were less influenced by the physical compared to social attributes (visitor numbers, composition) & indicated significantly greater preference for landscapes with ...



> natural forests in the foreground

> midground natural rejuvenation

< dogs

> high proportion of hikers compared to bicyclists

< 8 to 12 visitors

Implications

Previous experience matters: Understanding more fully the impact of past experience will be important as infestations and outbreaks continue under changing climate conditions & new species arrive. As little research examines experience in infested landscapes, results clearly point to the need an opportunity to do so.

Knowledge: Previous research suggested the impact of knowledge on landscape preferences and management varies. Results in this case suggest minimal impact of knowledge on perceptions. More refined knowledge measures can continue to explore its role in this area.