



March 30, 2022

Alaska Division of Forestry spruce beetle monitoring – Denali National Park

The following are the results from the spruce beetle monitoring effort initiated in 2021 at Denali National Park. Two Lindgren funnel traps were installed within the Park in 2021 under Research Permit # DENA-2021-SCI-0012 and in partnership with the Park. These traps are part of an effort to monitor spruce beetle populations in several locations within and near the ongoing outbreak in Southcentral Alaska. The monitoring locations within the park were especially valuable in 2021 as USDA Forest Service Forest Health Protection (FHP) and Alaska Division of Forestry (AKDOF) aerial surveyors noted heavy spruce beetle activity associated with the outbreak around Cantwell and scattered activity north to around Carlo Creek.

These monitoring traps assist us in tracking when the beetle flight period begins, peaks, and ends, as well as providing relative population information. As 2021 was the first year for this monitoring within Denali National Park, the data collected provide us a rough baseline of beetle activity in the area against which to compare future trap samples.

Each trap was initially baited with a Synergy Enhanced spruce beetle lure, which was later replaced by an AlphaScents spruce beetle lures for the remainder of the season. The AlphaScents lures were used for consistency with FHP trapping locations both north and south of the Park; we were unable to obtain them in time for the initial installation. The necessitated use of lures from two different manufacturers in 2021 is not ideal and complicates that baseline data somewhat. These two lures use different combinations or proportions of components and can attract differing numbers of beetles in the same forest stand. A single brand of lures will be used in any future monitoring efforts.

Monitoring sites

Two locations were selected in consultation with Denali National Park staff. As much as is possible, traps are placed at least 50 feet from a host tree to minimize the possibility of “spillover”, where beetles coming into a given trap attack trees near the trap.

DENA-S was located just off the Oxbow Trail in a small aspen stand at approximately 63.6599, -148.8335, adjacent to white spruce forests.

DENA-N was located just east of the Parks Highway near the Park entrance at approximately 63.7284, -148.8835. This location had a higher proportion of white spruce than DENA-S.

Sample processing information

The specimens of interest in the traps were sorted, counted, and placed into individual vials filled with 95% denatured ETOH by trap location and collection date; all insects caught in the traps were placed in the vials. These vials will be returned to the Park in 2022. In each trap, spruce beetles are the target, though the number of some other beetles are tallied as well if present – northern spruce engraver (*Ips perturbatus*), *Dryocoetes* species, and *Thanasimus* species. *Ips perturbatus* and

Dryocoetes species are competitors of spruce beetle and *Thanasimus* species, commonly called checker beetles, are bark beetle predators. If present and if sample processing time allows, other bark beetles, ambrosia beetles, and woodboring insects may also be noted in samples.

Results

The total cumulative spruce beetle trap catches for each location for the 2021 season are as follows:

- DENA-N: 66 spruce beetles
- DENA-S: 5 spruce beetles

Date Installed	TRAP_ID	Check	SB	IPS	Dryocoetes	Clerids
5/18/2021	DENA - N	6/1/2021	0	0	0	0
5/18/2021	DENA - N	6/15/2021	63	0	0	0
5/18/2021	DENA - N	6/29/2021	2	0	4	0
5/18/2021	DENA - N	7/12/2021	1	0	0	0
5/18/2021	DENA - N	7/27/2021	0	0	0	0
5/18/2021	DENA - N	8/10/2021	0	0	0	0
5/18/2021	DENA - S	6/1/2021	1	0	0	0
5/18/2021	DENA - S	6/15/2021	2	0	0	0
5/18/2021	DENA - S	6/29/2021	0	0	6	0
5/18/2021	DENA - S	7/12/2021	2	0	0	0
5/18/2021	DENA - S	7/27/2021	0	0	0	0
5/18/2021	DENA - S	8/10/2021	0	0	0	0

Additional information is available in the attached trap data spreadsheet

Discussion

While there is no formally determined trap catch thresholds for determining spruce beetle population levels in Alaska, the numbers of spruce beetles collected in each of these two locations are consistent with other monitoring locations in the region with low or endemic population levels. There is still the possibility that light or scattered spruce beetle activity may exist in the area, though none was readily observed during the trap installations. And with beetle populations higher around Cantwell, continued monitoring of these locations is recommended to provide more localized information relative to any future spruce beetle activity in the area.

The limited number of beetles collected make it difficult to draw many conclusions regarding the flight period, beyond that it appears to have run from about the beginning of June to mid-July. The trap installation timing in 2021 seemed sufficient and recommendations for the 2022 season are to plan for trap installation by mid-May or earlier if the daytime temperatures are nearing 60F before that time. We additionally recommend that the DENA-S trap location be adjusted slightly in 2022 to minimize any potential influence the aspen stand may have had on performance of the trap.

This report was compiled by Jason Moan, Forest Health Program Manager, Alaska Division of Forestry.