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In this issue:

Beetles and spiders as indicators of forest recovery on Prince of Wales Island, Alaska

by Jill Stockbridge[1]

Figure 1: Old growth.

After my twelve hour trip from Fairbanks, which involved three and a half hours on a ferry, I finally arrived on the island of Prince of Wales (POW), Alaska. It was a beautiful, sunny evening (which I soon learned was a rare occurrence) and I found the old growth trees magnificently large compared to the trees in Fairbanks. Everything seemed to be alive and moving in these old growth forests (Figure 1), including the many *Scaphinotus angusticollis* that were attacking a nearby snail. However, the serene picture abruptly ended after we started to pass by the acres of clear cut sites. I wondered how many species of animals have declined due to this destruction of their habitat and how we can help conserve their biodiversity. I learned that after clear cutting, spindly compact trees grow and sunlight can hardly penetrate through the canopy (McClellan, 2007). Without sunlight, dense understory vegetation, which many animals depend upon, is lacking. This stage can last up to 100 years, holding little value to wildlife since there is minimal understory (McClellan, 2007). In 2001, an adaptive management program called The Tongass Wide Young-Growth Studies (TWYGS) began a series of different thinning treatments of these young, even-aged stands (Figure 2). This program was conducted in order to determine which of these treatments best leads to a hastened recovery of the understory vegetation back to the old growth condition, providing a valuable habitat to animals (McClellan, 2007).

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Arthropods can be valuable indicators of change in ecosystems. Effective ecological indicators must be sensitive to changes in the environment that can be quantitatively measured such as showing positive or negative effects caused by human activity (Pearce and Venier, 2006). Terrestrial arthropods can be efficient ecological indicators due to the fact that they are one of the most diverse components of terrestrial ecosystems, they occupy a variety of functional niches and microhabitats, have high site specificity, they are relatively easy to collect and identify, and respond quickly to changes in their environment (Kremen et al., 1993; Dollin et al., 2008). I will be using beetles and spiders to determine which thinning treatment created by TWGYS is furthest along to recovery by analyzing how species compositions differ from the treatments and controls. The thinning treatments I will be using have different spacing between trees left standing (14, 16, and 18 foot spacing with 2 replicates of each treatment) (Figure 3). My controls will be old growth sites, young even-aged stands, and clear cut sites (6 replicates of each control). At each treatment and control, I will have two Lindgren funnels, four pairs of pitfall traps, (Lindgren funnels and pitfalls will be collected every two weeks) and a Berlese litter sample taken every other week from each site. Vegetation surveys will also be conducted at each site to characterize the understory and overstory vegetation.

Figure 2: Young, even-aged stand.

In addition to beetles and spiders, I will be jointly analyzing the effects of these different thinning practices on deer mice, species *Peromyscus keeni*, in collaboration with Drs. Flaherty and Ben-David from the University of Wyoming. The mammal team will set up grids of about forty Sherman traps per site, and mice will be pit tagged and recorded each morning. Altogether, the beetles, spiders, and deer mice will provide multi trophic-level knowledge of this system on POW.

Figure 3: 18×18 ft. thinned treatment.

The arthropod fauna in Alaska is poorly known, especially on POW. I will be contributing to Alaska's growing checklist by collecting arthropods around the island using a variety of methods (i.e., carrion-baited traps, black light, sweep netting, etc.) The data collected from the arthropods will be entered into the University of Alaska Museum's online database, Arctos.

So far I have found over 100 species of beetles and with my major adviser's help, Dr. Derek Sikes, we have begun to identify the beetles to species. The spiders are in queue to be identified by Dr. Sikes' MS student, Joey Slowik (expert on spider identification). Furthermore, I will be receiving aid from Dr. Jim Kruse for the identification of Lepidoptera. I am looking forward to discovering how the biodiversity of beetles and spiders are affected by these different forestry thinning practices as well as exploring Prince of Wales Island for its vastly unknown arthropod fauna.

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Comparison of current ground beetle (Coleoptera: Carabidae) and spider (Arachnida: Araneae) faunas in the Aleutians, Alaska, with samples made pre-1965

by Derek S. Sikes[2]

Abstract

Since 2008, with support from the United States Fish and Wildlife Service, the University of Alaska Museum has been conducting an opportunistic inventory of non-marine arthropods of the Aleutians. This report focuses on a comparison of modern to 50+ year old records for ground beetles (Carabidae) and spiders (Araneae). Preliminary results for the ground beetles for the US Aleutians and the Peninsula show only 23 of 99 species by location records from Lindroth (1963) are represented by recent specimens in the University of Alaska Museum (23%). Within the most well-sampled region in modern times, Adak-Atka, there were 11 species recorded by Lindroth, of which 9 have been resampled (82%). There are four species by location new records represented by specimens in the University of Alaska Museum (UAM) that were not documented in Lindroth (1963). All carabid species represented by UAM specimens were documented by Lindroth (1963); however, 18 of the 33 (55%) carabid species documented by Lindroth (1963) have not been documented in the Aleutians since 1963. These results are preliminary due to pending identifications of carabid specimens on loan to Dr. R. Davidson which, when complete, will increase the number of shared records and decrease the number of 1963-only records.

A comparison of results for spiders (Araneae) for the US Aleutians shows 17 of 65 species by location records from pre-1965 publications are represented by specimens in the University of Alaska Museum (26%). There are 17 species by location records represented by specimens in the University of Alaska Museum that were not documented in pre-1965 publications. Eleven species represented by UAM specimens were not documented in pre-1965 publications and are thus new records for the Aleutians. Nineteen of the 38 spider species documented in the Aleutians in pre-1965 publications have not been documented since (50%). The modern-day spider fauna of the Aleutians is both larger than and slightly better documented than the carabid fauna but the data remain sparse for both groups.

Introduction

The terrestrial (non-marine) arthropod fauna of Alaska is poorly known as evidenced by the over 800 new state records that have been documented in the last four years (Sikes et al., unpublished data). The Aleutians, due to their remoteness, are particularly poorly known. With funding from the United States Fish and Wildlife Service a survey was initiated in 2008.

Research efforts on the arthropods of the Aleutians are focused into three overlapping projects (1) an all-species checklist, (2) a comparison of current ground beetle and spider records with those from a 1958 survey and (3) documentation of the ecosystem reassembly of post-eruption Kasatochi. Only the second project is reported herein. Details on the Kasatochi research can be found in Sikes and Slowik (2010) and Smith et al. (2010), the latter of which describes a new species of sawfly from pre-eruption Kasatochi (*Pseudodineura kasatochi* Smith, Goulet, & Sikes).

Carl Lindroth, a swedish entomologist of legendary status, had traveled through the Aleutians from the Commander Islands to the Alaska Peninsula in 1958 to document his

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group of interest — ground beetles (Coleoptera: Carabidae) (Figure 1). He also collected spiders (Figure 2), which often share habitats with ground beetles and thus require little additional collecting effort. Although Lindroth didn't specify in his 1963 paper his data sources, the records he published are known to be a combination of those he personally collected and all those he had studied based on specimens from museums around world. Therefore it is unknown how many of Lindroth's records were based on his own 1958 survey. Lindroth documented 33 carabid species, excluding those that were found only on the Alaska Peninsula, which he reported on by major island groups he had visited (Lindroth, 1963). The spiders from his collecting were identified and published on by Holm (1960) who reported 27 Aleutian species. Given that over fifty years has passed since Lindroth's survey I thought it would be interesting to compare results from our current survey efforts with his to address questions such as "Has the ground beetle and /or spider fauna changed in 50 years?" and "Assuming these faunas have not changed, how effective are the current sampling methods in comparison to those employed in 1958 by Lindroth?"

Figure 1: *Scaphinotus marginatus* (Fisher von Waldheim), a snail and slug predator. UAM specimen UAM100011919 from the Alaska Peninsula.

Methods

Specimens were collected by myself during the following dates: 9-12 June 2008, 10-15 July 2009, 9-13 August 2009, 2-11 August 2010, by US Fish & Wildlife Service (USFWS) volunteers (see acknowledgments) throughout the summer of 2008 and 2009 who monitored pitfall and Malaise traps, Dominique Collet 11-23 July 2008, and by visiting entomologists Henri Goulet, Anais Renaud, and Caroline Boudreault during 10-15 July 2009. Duration of collecting time per island was often limited to 1-3 hours, due to the USFWS vessel's schedule. The vessel's schedule also dictated which islands were visited, producing an opportunistic collecting strategy that was not designed to replicate Lindroth's survey. Pitfall traps, colored pan traps, and Malaise traps were used in addition to sweep netting (in conjuction with an aspirator) and hand collecting. Pitfall traps are standard methods for sampling ground beetle and spider species because both have many active crawling species. Specimens were preserved in either 70% ethanol or propylene glycol (non-toxic) antifreeze for transport to the University of Alaska Museum Insect Collection preparation laboratory. These efforts have produced 8,339 specimens or lots of non-marine Aleutian arthropods cataloged into the University of Alaska Museum.

In 1958 Lindroth visited islands that included non-US territory (Commander Islands) and islands that are rarely visited by the USFWS (Umnak) including a sampling of the Alaska Peninsula. He was interested in documenting the full biogeographic distributions from the North American mainland to the Asian mainland across the Aleutian chain. I've omitted species that he listed as known only from the Alaska mainland because these are not Aleutian species. I've also omitted his records for the Commander Islands which are not US property. Lindroth used broad groupings of islands. For example, he had sampled Attu and Adak but apparently nothing in between. Thus, modern records from islands like Kiska (approx. half way between Attu and Adak) are not easily categorized into either of Lindroth's 'Attu' or 'Adak' regions. I chose to group all records west of Amchitka Pass into the 'Attu' region and islands east of this pass but west of Amukta Pass into the 'Adak' region. Lindroth had three other regions: Umnak, Unalaska, and the Peninsula. Islands like Rootok and Aiktak which are in between the Peninsula and Unalaska were grouped as Unalaska records. Chowiet records were placed in the Peninsula group. Two comparisons are made with Lindroth's data — a full table comparison in which his species by location data are compared to UAM's data and also a subset comparison in which only those island groups that were actually visited by the USFWS vessel for entomological sampling are compared. The latter comparison is made because obviously there are no recent records from islands that were not resampled. The more interesting question is of those islands that were resampled, how well did we do relative to the baseline established by Lindroth in 1958? Similar comparisons were made for the spider records published by Holm (1960) based on Lindroth's 1958 sampling.

There were additional publications with spider records in addition to the Holm (1960) report so these were added for historical comparison. No Holm (1960) records were georeferenced from the Peninsula so these data are lacking.

Figure 2: *Cybaeus reticulatus* Simon, one of the more common species found throughout the Aleutians, photographed by D. Sikes, alive on Kasatochi, 11 June 2008.

Results & Discussion

Ground Beetles

Table 1 shows the 33 ground beetle species Lindroth (1963) documented from the Aleutians by major island group along with indicators for which species and island groups are also represented by specimens in the UAM. Some of these UAM specimens are historical (<1970; both Umnak records and one Unalaska record). The comparison of Lindroth's 1958 sampling to our current records shows many species by regions that lack modern data. Of all the records of Lindroth in Table 1 ($n = 99$) only 25 have specimens in UAM and of these only 23 are modern records (23%). Of the 33 species documented by Lindroth (1963) 18 (55%) have not been documented since. This greeat disparity suggests many species have since been extirpated from islands they occupied in 1958 and/or Lindroth was a far more efficient and thorough collector than I.

Two additional sampling-related explanations make the disparity less dramatic and reduce the concern of extirpations — Umnak, which accounts for 20 of Lindroth's 99 records, was not sampled in modern times. Ignoring the Umnak data, the number of shared samples increases slightly to 27%.

Additionally, the greatest number of shared species occur in the Adak region (82%). All carabid specimens from Kasatochi, in this region, have been identified to species. This island and Adak have received far greater collecting and identification effort than any of the eastern regions which indicates that extirpation is a far less likely explanation for the disparity than undersampling. Robert Davidson, a carabid specialist at the Carnegie Museum of Natural History, has 1,726 UAM carabids from the Aleutians on loan

Table 1: Comparison of 33 ground beetle (Coleoptera: Carabidae) species recorded by Lindroth (CL1963) to those represented by specimens in the University of Alaska Museum (UAM). Asterisks indicate UAM records from >2008 samples.

Species	Attu	Adak-Atka	Umnak	Unalaska	Peninsula
Carabus taedatus			CL1963, UAM	CL1963, UAM	CL1963, UAM*
Carabus chamissonis				CL1963	CL1963, UAM*
Scaphinotus marginatus	UAM(Agattu)*	CL1963, UAM*	CL1963	CL1963, UAM*	CL1963, UAM*
Dicheirotrichus cognatus	CL1963	CL1963, UAM*	CL1963	CL1963	CL1963, UAM*
Harpalus fulvilabris				CL1963	UAM*
Harpalus nigritarsis				CL1963	
Acalathus advena	CL1963, UAM*	CL1963, UAM*	CL1963	CL1963, UAM*	CL1963
Calathus ingratus			CL1963	CL1963, UAM*	CL1963, UAM*
Pterostichus adstrictus	CL1963, UAM*	CL1963, UAM*	CL1963	CL1963	CL1963, UAM*
Pterostichus empetricola	CL1963	CL1963, UAM*	CL1963	CL1963	CL1963
Pterostichus pinguedineus			CL1963	CL1963	CL1963
Pterostichus similis				CL1963	CL1963
Pterostichus ventricosus			CL1963	CL1963	UAM*
Amara torrida	CL1963		CL1963, UAM	CL1963	CL1963
Amara quenseli	CL1963	CL1963, UAM*	CL1963	CL1963	CL1963
Loricera pilicornis	CL1963	CL1963, UAM*	CL1963	CL1963	CL1963, UAM*
Nebria nivalis					CL1963
Nebria sahlbergii					CL1963
Nebria gregaria	CL1963	CL1963, UAM*		CL1963	
Nebria metallica	UAM(Buldir)*	CL1963, UAM*	CL1963	CL1963	CL1963, UAM*
Pelophila borealis	CL1963	CL1963	CL1963	CL1963	CL1963
Notiophilus aquaticus			CL1963	CL1963	CL1963
Bembidion arcticum			CL1963	CL1963	CL1963
Bembidion complanulum				CL1963	CL1963
Bembidion incertum			CL1963	CL1963	CL1963
Bembidion quadrifoveolatum				CL1963	CL1963
Bembidion grapii			CL1963	CL1963	CL1963
Bembidion petrosum	CL1963				
Patrobus fossifrons				CL1963	
Patrobus foveocollis				CL1963	CL1963
Patrobus septentrionis	CL1963	CL1963	CL1963	CL1963	CL1963
Trechus apicalis					CL1963
Trechus chalybeus			CL1963	CL1963	CL1963

Table 2: Comparison of 49 spider (Araneae) species records. Pre-1965 literature sources vs. specimens in the University of Alaska Museum. B1900 = Banks (1900), CI1947 = Chamberlin and Ivie (1947), H1960 = Holm (1960). 11 species newly reported for the Aleutians are in bold. *nomen dubium*.

Species	Attu	Adak-Atka	Umnak	Unalaska
***Callobius pictus* (Simon)**				**UAM**
Clubiona trivialis Linnaeus				H1960
Cybaeus morosus Simon		H1960		
Cybaeus reticulatus Simon	H1960, UAM	H1960, UAM	H1960	H1960, UAM
***Aphileta misera* (O. P.-Cambridge)**		**UAM**		
Bathyphantes brevipes (Emerton)	H1960, UAM	H1960, UAM	H1960	H1960
***Bathyphantes iviei* Holm**	**UAM**			
Bathyphantes pogonias Kulczyn'ski	H1960			
Centromerus sylvaticus (Blackwall)	H1960	H1960		
Collinsia holmgreni (Thorell)				H1960
***Diplocephalus sphagnicola* Eskov**		**UAM**		
Eperigone lindrothi Holm		H1960, UAM	H1960	
Erigone simillima Keyserling				CI1947
***Erigone aletris* Crosby & Bishop**	**UAM**	**UAM**		
Erigone atra Blackwall		UAM		CI1947
Erigone dentigera O. P.-Cambridge		H1960	H1960	
Erigone viabilis Chamberlin & Ivie	H1960		H1960	H1960
Erigone urusta Keyserling*		CI1947		
Erigone whymperi O. P.-Cambridge		H1960	H1960	H1960
Eulaira arctoa Holm	UAM	H1960, UAM	H1960	
Gnathonarium suppositum (Kulcz.)	H1960, UAM			
***Gnathonarium dentatum* (Wider)**	**UAM**			
Halorates alascensis (Banks)			H1960	
***Hilaira herniosa* (Thorell)**		**UAM**		
Islandiana falsifica (Keyserling)		CI1947		
Lepthyphantes complicatus (Emer.)	UAM	CI1947		H1960
Meioneta mollis (O. P.-Cambridge)			H1960	
Micrargus aleuticus Holm		H1960	H1960	
Oreonetides vaginatus (Thorell)	H1960			
Pocadicnemis pumila (Blackwall)		H1960, UAM	H1960	H1960
Porrhomma convexum (Westring)	H1960		H1960	H1960
Satilatlas marxi Keyserling				CI1947
Sisicottus nesides (Chamberlin)	H1960, UAM	H1960, UAM	H1960	H1960
Sisicottus montanus (Emerton)			H1960	
Tennesseellum formica (Emerton)				CI1947
Walckenaeria communis (Emerton)		H1960, UAM	H1960	H1960
***Walckenaeria spiralis* (Emerton)**		**UAM**		
Walckenaeria karpinskii (O. P.-Cambridge)		H1960	H1960	
Alopecosa pulverulenta (Clerck)	CI1947, UAM			
Arctosa alpigena (Doleschall)				
Arctosa raptor (Kulczyn'ski)				
Pardosa glacialis (Thorell)				
Pardosa palustris (Linnaeus)	UAM	UAM		H1960, UAM
***Trochosa terricola* Thorell**	**UAM**			
***Usofila pacifica* (Banks)**		**UAM**		
Tetragnatha versicolor Walckenaer				CI1947
Robertus vigerens (Chamb. & Ivie)	H1960, UAM	H1960, UAM	H1960	H1960
Rugathodes sexpunctatus (Emerton)	H1960	H1960, UAM		
***Rugathodes aurantius* (Emerton)**				**UAM**

awaiting identifications. He identified and returned specimens belonging to easy-to-identify species but has retained those that take greater identification effort. As a special favor for the Kasatochi research he identified all Kasatochi carabid specimens, which included some of the harder to identify species. This, combined with the greater collecting effort, explains the higher percetage of shared species for the Adak region. Once these 1,726 specimens have been identified I expect the number of shared records for the Attu region will greatly increase. The number of shared records for the Umnak, Unalaska and Peninsula regions is not likely to increase much because these regions have received far less collection effort than the two major western regions.

Nevertheless, Lindroth was amazingly good at sampling the carabids of the Aleutians. No new species have been discovered that he (or others before him) hadn't already documented in his 1958 survey and only four regional records have been added that he lacked. Not all carabid species are equally likely to be captured by pitfall trapping and typically, modern hand-collecting efforts are limited to <3hours per island. In contrast, although lacking full-season pitfall trapping, Lindroth probably had days of hand-collecting time per island and knew how to target carabids by each group's particular microhabitats. Unfortunately, Lindroth (1963) provides no details on his methods, how many records came from collections by others, or his travel schedule through the Aleutians.

There are two species for the Attu region that Lindroth did not collect (*Scaphinotus marginatus* and *Nebria metallica*). These were taken in 2008 on Agattu and Buldir respectively, so they may have been (and may still be) absent from Attu itself, thus explaining their absence from Lindroth's data. One mainland record for each of *Harpalus fulvilabris* and *Pterostichus ventricosus* was found on Sanak which I categorized as Peninsula records that Lindroth lacked.

The brachypterous (flightless) and Aleutian endemic species *Nebria gregaria* was found on Kasatochi in 2010. Given its flightless nature it is unlikely to have immigrated to the island post-eruption and is probably another case of a species having survived the eruption. It is mentioned here because this record was discovered after the 2009 Kasatochi results were published.

Spiders

The comparison (Table 2) of historical published spider records for the Aleutians with modern records in the UAM differs from the carabid comparison in various ways. The spider data are drawn from three major publications, only one of which, Holm (1960), is based on Lindroth's 1958 survey material. Therefore, the historical sample is larger than that acquired by Lindroth. However, most caveats stated in the carabid results apply to the spider results. There are Peninsula records for spiders in Holm (1960) that were not georeferenced and thus not included in this report. These records would no doubt increase the number of historic spider records considerably. Umnak was not sampled during modern times thereby explaining the 17 historic records from Umnak without modern samples. One *Cybaeus reticulatus* record and one *Cybaeus morosus* record from Chumaginadak and one *Robertus vigerens* record from Bogoslof collected by D. Collet in 2008 are not listed in Table 2., although both islands are close to enough to Umnak to consider these modern records for this region.

Seventeen of 65 species by location records from pre-1965 publications are represented by specimens in the University of Alaska Museum (26%). Without the 17 Umnak data the number of shared records increases from 26% to 35%. There are 17 species by location records represented by specimens in the University of Alaska Museum that were not documented in pre-1965 publications and are thus new within-Aleutian regional records. Eleven species represented by UAM specimens were not documented from any Aleutian island in pre-1965 publications and are thus new records for the Aleutians. Nineteen of the 38 spider species documented in the Aleutians in pre-1965 publications have not been documented since (50%), which is a slightly higher resampling rate for the region than seen with the carabids. With modern and historic records combined there are 49 spiders species known from the Aleutians. Similar to the problem seen in the carabids, there are spiders from 2010 samples in Attu that have yet to be identified. A direct comparison of the spiders collected by Lindroth in 1958 and published on by Holm (1960) with those collected in modern times and represented by specimens at UAM show a similar level of diversity in both samples — Holm reported 27 species and UAM has 25 species. However, the overlap between these two samples is low; only 11 species are shared.

Conclusions

Both ground beetles and spiders are predaceous and show a similar level of diversity. There appear to be more species of spiders than ground beetles in the Aleutians (33 ground beetles vs 49 spider species known) and when historic and modern records are combined the spiders seem to be less well sampled as evidenced by the 11 spider species newly reported from the Aleutians. These new records suggest the spider fauna as a whole was either much larger than Lindroth managed to document and/or has undergone more change since. No carabids missed by Lindroth have been found. A comparison of modern resampling success between these groups indicates spiders have been resampled with slightly greater success than the carabids (50% of historic spider species vs 45% of historic carabid species).

Of the two explanations for un-resampled species, extirpations and undersampling, I consider the latter to be the most likely. At the very least, undersampling must be ruled out before invoking extirpation to explain a species' absence. Undersampling artifacts can have numerous causes: not having visited an island or region, not having spent enough time on an island to cover the diversity of habitats present, and not being on an island during the optimal time of the active season. In addition, having collected a species but not having yet identified the specimens would also produce a false absence. All of these explanations, and probably more, are likely to account for the majority of historic records in these groups that haven't been detected in modern times. If we assume, on the other hand, that the faunas have not changed since 1958, it is clear that our methods have fallen short of Lindroth's!

The only extirpations we are fairly confident have happened since Lindroth's survey are those that occurred on Kasatochi as a result of its August 2008 eruption. Nine spider species and six carabid species were documented on pre-eruption Kasatochi (but post-Lindroth's survey so these are listed in Table 1). Post eruption we have found two spider species and one carabid, all singletons and thus lacking evidence of post-eruption breeding. Oddly, the carabid, a flightless species, was not detected pre-eruption. It is therefore uncertain if these three species will persist. Catastrophic (whole-island) volcanic eruptions are not common in the Aleutians, at least on a 50 year time scale. Little is known about the population dynamics of carabids and spiders on these islands so I cannot speculate on the likelihood of extirpations or, for that matter, the frequency of colonizations of new islands by taxa formerly absent.

This report, by focusing on two historically, relatively well-studied taxa, ground beetles and spiders, demonstrates how sparse and incomplete the sampling of the region remains. It seems clear that we have barely begun to understand the fauna of the Aleutians. To speak with confidence on the non-detection of a species from an island will require considerably more sampling effort than is currently being expended.

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The Trouble with Alder...

by Ken Zogas[3]

Figure 1: Alder defoliation.

Ask nearly anyone who has ever tried to maneuver a kayak, or a backpack, a firearm, survey equipment, or anything else through a stand of alders, what they think of alder, and the kindest comment you're likely to get is, "If I never see another alder again, I'll die a happy person". Yet the grief it hands out to us in spades every time we have to push our way through it belies the very positive impact it has on the local environment.

Research suggests that up to 70% of the available nitrogen in the most productive forests may have its origin in stands of alder and that the rate of nitrogen fixation can decline by as much as 73% following defoliation. Further, studies in Southeast Alaska have shown that the mere presence of alder in riparian habitats could protect or even improve the productivity of aquatic organisms, thus having a positive impact on fisheries and salmon production.

Alder has always seemed to be one of those things that's, 'just always there'—healthy, green, vibrant, impervious to snow loads, avalanche, periodic flooding, and one of the first plants to arise following major disturbance events. It has always hosted a variety of insects, from weevils to leaf rollers, sawflies, etc., yet it seems to shrug off their impact with an almost casual indifference. But times have started to change....

Figure 2: *Eriocampa ovata* larva.

Beginning in the 1990's, a variety of agents, entomological, pathological, and possibly climatic, began adversely impacting alders throughout their range in Alaska, yet in a seemingly unrelated way. Aerial surveys began finding large patches of discolored alders throughout the southwest and interior parts of the state. Upon close inspection, these alders showed no apparent signs of insect activity or fungal infection. An invasive insect, *Eriocampa ovata*, the alder wooly sawfly (Figures 2-3), was found to be infesting riparian alders, primarily thin-leaf alder, *Alnus incana* subsp. *tenufolia*, and Sitka alder, *Alnus sinuata*, throughout the Anchorage Bowl (Matthews et al., 1997). As

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time went on, more impacts to alder were found. In 2003, *Sunira verberata*, a generalist hardwood defoliator from the Noctuid family was found severely defoliating alders in Katmai National Park (Wittwer et al., 2004), while at the same time, considerable amounts of alder mortality were observed in the same general area. In south central and interior Alaska widespread areas of alder mortality were found and attributed to what had previously been considered a rather benign fungus, *Valsa melanodiscus*. Finally, significant alder defoliation events first noted in the Matanuska-Susitna River Valley and later, on the Kenai Peninsula, Anchorage, and the Eagle River Valley, were examined and found to be caused by a newly identified invasive sawfly, *Monsoma pulveratum*, now commonly referred to as the Green Alder Sawfly (Kruse, 2010; Kruse et al., 2010). To make matters worse, this new sawfly was occasionally found feeding in concert with both the alder wooly sawfly and at times, a less common, circumpolar, resident sawfly, the striped alder sawfly, *Hemichroa crocea* (Figure 4), essentially tripling the magnitude of defoliation on given alders within the targeted stand.

Figure 3: *Eriocampa ovata* adult.

Often during examinations of these stands for sawfly activity, varying amounts of alder mortality, both older mortality and current activity clearly caused by *V. melanodiscus*, were noted. Having seen this pattern repeat itself from site to site, the question quickly arose as to the possibility of an association between the fungus and the sawflies. Adding to this suspicion was the fact that unique amongst the sawflies, *M. pulveratum* overwinters not only in dead or decaying wood rather than in the soil as do most other sawflies, but in the wood of live trees, often using branch scars and other bark lesions as a way to gain entry. This type of activity could conceivably create a perfect entrance pathway for *V. melanodiscus*.

Figure 4: *Hemichroa crocea* larvae.

To answer this and other questions regarding the dynamics of these two organisms, a 2-year Evaluation Monitoring Study was begun in 2010, led by Dr. Jim Kruse and Dr. Lori Winton, both of the U.S. Forest Service, Forest Health Protection Group in Alaska.

From an aerial survey perspective, current work involves refining aerial signatures for both alder canker and sawfly defoliation with the aim being better range and distribution information for these organisms and their impact on alders in Alaska.

Whatever the outcome of this study, it appears life will not soon be as placid and carefree for Alaskan alders as it has in the past.

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Review of the Fourth Annual Meeting

by Matthew L. Bowser[4]

The fourth annual meeting of the Alaska Entomological Society took place at the Alaska Department of Natural Resources building in Fairbanks on February 4, 2011.

Presentations

Derek Sikes shared with us about his work out in the Aleutians, focusing on his work comparing the fauna of Kasatochi Island pre- and post-eruption. His photographs of this remote region were impressive. **Sayde Ridling**, who has been processing **Dominique Collet**'s large donation of specimens to the University of Alaska Museum, highlighted the significant numbers of additions to the Alaskan fauna which were represented in this material. **Dennis Fielding** gave an overview of work being done by ARS staff, focusing on **Rehanon Pampell**'s project on Alaskan *Bombus* species in agricultural settings and his work on periodicity of grasshopper species in Alaska. He has found evidence that periodicity in grasshopper abundance (a 10- to 100-fold difference in population density) is caused by asynchrony between the grasshoppers and their dipteran parasitoids. **Brandi Fleshman** presented on her study comparing ground spider communities in grasslands in Delta Junction. **Jill Stockbridge** described the master's project she has begun evaluating the effects of different logging practices on spiders and beetles on Prince of Wales Island. **Jim Kruse** gave us the report on forest health conditions in Alaska, including new information on the Green Alder Sawfly. I reviewed the early entomological explorations of Alaska from Johann Friedrich von Eschscholtz's circumnavigational journey with Otto von Kotzebue to Trevor Kincaid's work on the Harriman Alaska Expedition. **Roger Burnside** described his work assessing different methods of managing slash for the purpose of minimizing mortality of residual spruce trees caused by the Northern Spruce Engraver beetle.

The student award committee awarded the **Student Presentation Award** to **Brandi Fleshman** for her presentation, "Influence of field age on the ground spider community in managed grasslands, Delta Junction, Alaska". **Jill Stockbridge** was given a second place **Student Presentation Award** for her presentation, "Effects of different logging practices on the beetles and spiders on Prince of Wales Island, Alaska".

Business Items

- We decided to provide at least one half scholarship for one student to attend Denali Bug Camp (about $250), with the option of providing a half scholarship for another student if additional donations are received toward this end (see announcement, page 13).
- We decided to give awards for projects in entomology at regional Alaska science fairs beginning in spring of 2012.
- The current slate of officers was retained for the present.

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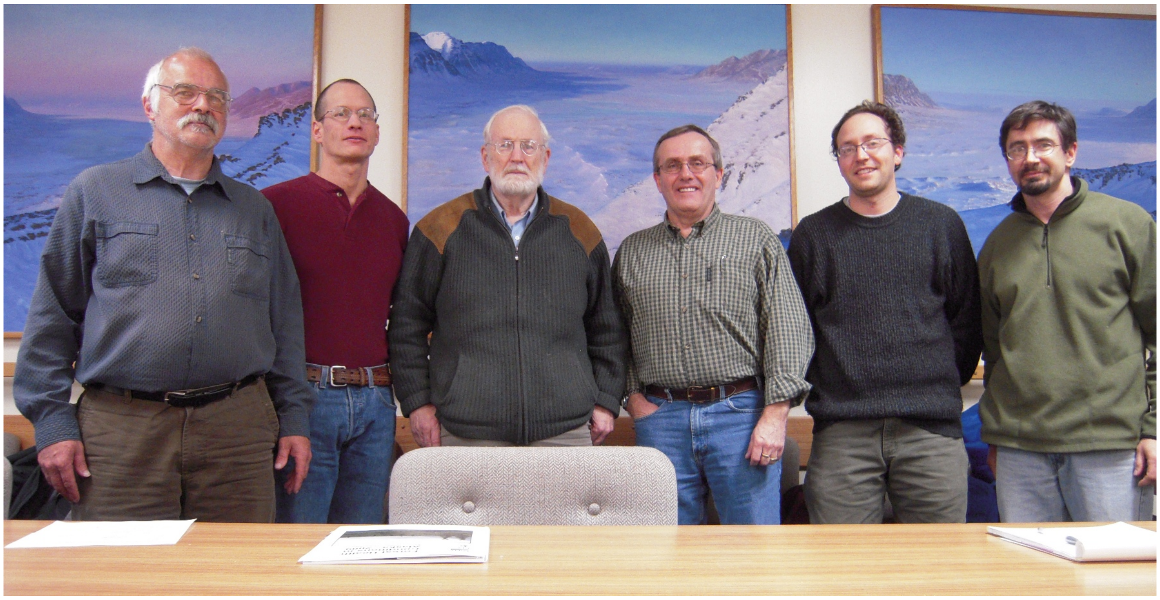

Figure 1: Members still present at the end of the business meeting: (from left) Dominique Collet, Jim Kruse, Ken Phillip, Roger Burnside, Matt Bowser, and Derek Sikes.

Upcoming Events

Southeast Alaska Bioblitz 2011, June 18-19

The second Southeast Alaska Bioblitz will be based on the University of Alaska Southeast campus at Auke Bay. Details will be posted via the Alaska Coastal Rainforest Center.

Denali Bug Camp, June 27 - July 1

A new offering from the Denali Education Center, Denali Bug Camp is a 5 day program for 5th and 6th grade students.

Kenai National Wildlife Refuge Mini-Bioblitz, June 28 - July 1

The Kenai National Wildlife Refuge is seeking to build its inventory of terrestrial arthropod species. Entomologists and students are invited to participate in inventory work over the course of the field season with a week of focused effort concentrated during the last week of June. To participate, please contact Matt Bowser at `Matt_Bowser@fws.gov`.

Southcentral Bioblitz 2011, July 23-24

The first southcentral Bioblitz will be based at the Begich-Boggs Visitor Center in Portage Valley. Details will be posted on the website of the Alaska Coastal Rainforest Center.

Fifth Annual Meeting, January 27-28, 2012

The fifth annual meeting is scheduled for January 27-28 in Anchorage. Details are yet to be decided.