

Experience in fieldwork, remote sites, transport & logistics, and field safety

Scope of experience organizing remote fieldwork and complex logistics:

The ability to work effectively and safely individually and with a variety of others in remote and logistically complicated settings has been important in my projects including wilderness fieldwork, remote project logistics, aviation and boat transport, narrow windows of opportunity, foreign locations and languages, and rapidly changing priorities.

I have conducted ecological fieldwork on projects in Alaska, Michigan, the US Southeast and Northwest, Ontario, Russia, Ukraine, Belarus, the Republic of Georgia, and Ecuador. This includes work for the US Fish & Wildlife Service, the US Forest Service, the National Park Service, the Natural Conservation Resources Service, graduate and undergraduate university research, and volunteer work.

In these projects, I have been responsible for organizing complicated logistical and field research arrangements frequently involving precise coordination with a variety of individuals and organizations to successfully complete projects in remote, foreign, and other complicated locations.

Specific working experience:

With the **US Fish & Wildlife Service** I led a fieldwork-intensive multi-year vegetation inventory project in remote and rarely visited interior Alaska National Wildlife Refuges.

This project has built on remote fieldwork experience developed in previous work, especially with the US NPS, USDA NRCS, and undergraduate and graduate field projects, and has included full project planning from idea to implementation to reporting including:

- Selection of field sites from GIS, aerial and satellite imagery, maps, GIS, and additional sources prior to site visit and preparation of field maps, plans, and routes.
- Organizing & coordinating transport of crew & equipment to remote Alaskan field sites including fly-in villages and bush sites.
- Oversight of safety & emergency training & equipment.
- Field navigation and reconnaissance for field sites.
- Field plant ID and collection, including bryophytes & lichens.
- Measurement and observation of various site ecological characteristics.
- Vegetation and other landscape classifications.
- Insect malaise trapping.

I participated in field forestry and ecology projects at the **USFS Rocky Mountain Research Station (RMRS)** 2010-2012, with office work in remote sensing and ecological fieldwork in Idaho, Washington, Oregon, and Montana, including:

- Forest measurement activities (including stand density, basal area, seedling number and age structure, seed production, canopy metrics, etc.) relating to forest and stand productivity and structure and fire recovery.
- Forest type classification and community floristics.
- Long-term forest vegetation change detection and botanical inventory.

- In summer 2016 I participated, as an FWS botanist, in interior Alaskan fieldwork with my former RMRS and University of Idaho colleagues on a satellite imagery postfire succession analysis project that I previously worked on as a remote sensing specialist while at RMRS.

In 2010 I worked for the **Central Alaska I&M Network** (US National Park Service) in the Yukon-Charley Rivers National Preserve as unit crew leader and vascular plant botanist on a long-term ecological monitoring project being conducted in several Alaskan US National Park Service units (I had occasionally assisted with the Denali component of this project while at Denali NP 2005-2007).

- Fieldwork involved working with a 3-4 person crew in remote backcountry areas of the Preserve - where the closest other people were miles or tens of miles distant - to document ecological conditions.
- I was responsible for project field planning and logistics, work crew direction and supervision, data stewardship, and typical aspects of remote wilderness fieldwork such as selecting and setting base camps, communications, safety and first aid, and wilderness navigation.
- Transport to our staging location was via fixed-wing light aircraft from Fairbanks to the ranger station in Eagle; remote base camp sites were then accessed from Eagle either via helicopter or boat based on location.
- I was the boat pilot for the team, and gained useful experience operating motorboats and navigation on the complicated and extremely variable Yukon River.
- Field sites were in grids of 25 pre-selected points in a ~6 km² area, and navigation to these sites for daily fieldwork was made using map, compass, aerial imagery, and GPS (Trimble and Garmin).
- Field travel was by foot over often very rough, steep, and/or wet terrain in all weather conditions, up to ~5km overland (no trail) from base camp and often involved attempting several routes before finding access.
- In addition to team leader responsibilities in this work, I was the vascular plant botanist and made species identifications on-site or collected specimens for later determination as well as recording other ecological and landscape data.
- Post-field project work included GPS data manipulation (using Trimble hardware and software), GIS and map preparation, botanical specimen curating and identification, data management, project report preparation, and equipment maintenance.

My ecologist work with the USDA **Natural Resources Conservation Service** in 2008-2009 included extensive remote helicopter- and boat-accessed fieldwork in Yukon-Charley Rivers National Preserve and Kodiak Island.

- My work in this project was as lead ecologist and responsibilities were pre-field site planning and landscape classifications, fieldwork including plant identifications and collections; site selection; field documentation; field navigation and safety considerations; and post-field work including development of ecological models and clarification of successional pathways.
- Typical fieldwork was early morning helicopter travel from a base camp to the proximity of the first field site with scientific, communication, and safety equipment sufficient for a full day's work and travel (and emergency equipment for unforeseen delays). Thence navigation by foot

over various terrain including steep mountain slopes, rivers, wetlands, tussocks, bogs, and other difficult terrain to access a series of field sites then evening pickup by helicopter or boat from a predetermined time and location.

- Daily work was usually accomplished by a team of one soil scientist and myself; team sizes were occasionally larger; up to 6 or 7 individuals.

At **Denali National Park** I was the vegetation ecologist and project lead in support of an EA process under the direction of the Park's plant ecologist, tasked with planning and implementation of ecological studies to document the setting and nature of off-road vehicle (ORV) use and impacts on vegetation, soils, and landscapes in Park subsistence use areas. This required extended backcountry fieldwork conducted over several field seasons.

- I was responsible for arranging all logistics and supplies for fieldwork, coordinating and scheduling transport including helicopter; ORV; and foot travel, training and scheduling field crew, development of fieldwork research and documentation methodologies, delegation of fieldwork responsibilities and camp duties, understanding and following applicable permitting; safety; and sanitation procedures, and responding to field crew and equipment limitations; hazardous weather; and other dynamic field situations affecting fieldwork or site access.
- Fieldwork involved establishment of remote field camps for 3-7 days' duration per site and several shorter and closer single-day field trips.
- Typical fieldwork consisted of leading a crew of two to four individuals during long days of intense data collection working over small to large distances, often in rough, thick, steep, or inundated terrain (often all four), while carrying field equipment in packs and conducting site and linear surveys and mapping using GPS, photography, field data sheets and notebooks, ground measurements, and other methods.

In addition to the fieldwork described above, project work also included:

- Planning and executing helicopter and fixed-wing aerial reconnaissance and GPS mapping, aerial photography, ORV impact investigations and reporting, and related logistical and safety.
- I sometimes coordinated my fieldwork with related projects, e.g., a stream hydrological study with a contracting hydrologist that was planned at the site of one of my Denali backcountry fieldwork sites immediately following my work. This component was in doubt until after I had left for the field because of regulatory, funding, and administrative delays. Nonetheless, I had made contingent supply, helicopter transport, backcountry work, and safety arrangements for the work to be done, and plans to swap my field crew for the hydrologist by helicopter if the project came through or to return to Park HQ if not. In the end, the project was finalized two days before the scheduled hydrological work, the hydrologist made it, and we completed the hydrological survey fieldwork.
- I assisted several times per season with field logistics, helicopter support, and ecological fieldwork on other Denali Botany backcountry research projects such as the NPS Central Alaska Network's Long-Term Ecological Monitoring project, (which I later joined in 2010; see above).

At **Glacier Bay National Park & Preserve** 2002-2004 during two seasonal and one contract position I participated in aerial, boat, and ground fieldwork including:

Working for the Park's aquatic biologist, I conducted monthly **boat-based surveys of fisheries** activity in remote areas of the Park.

- These required day-long (8-12 hour) trips in an 18' outboard skiff and well-timed travel (to schedule a precise window between extremely strong tidal currents in Glacier Bay) across the complex waters of Glacier Bay & area using charts (and advice!) to navigate the very heterogeneous water and weather conditions and avoid dangerous currents, shallows, rocks, marine mammals, and other hazards and complexities.
- Field work was conducted from the boat, and entailed approaching, retrieving, identifying, and recording data and locations from fisheries gear buoys using GPS and field data forms.
- Crew on these trips consisted of myself and one or two other Resources Management personnel, and I was responsible for arranging the schedules, boat use, survey equipment, communication equipment, safety & survival gear, prioritizing survey operations and delegating tasks (which required precise coordination of boat position; data collection; and equipment use to avoid spills), assuring accurate data collection and data stewardship, and safe return while tidal conditions were right.

Another project at Glacier Bay was **aerial commercial fishing surveys** in the Park's outer (nearshore oceanic) waters.

- Fieldwork was conducted several times a week from fixed-wing aircraft to observe and photograph commercial vessels in Park waters to determine distribution, intensity, and variation of fisheries.
- The work was performed from small aircraft (Cessna 206 or 172) with one pilot. The work involved photography, GPS, and field observations (primarily to identify vessel registration number and thus fishing license type) made during often rough flights as well as post-field data work.
- Survey work was performed in low elevation flights in remote areas far from roads, often in rough winds, and over rocky areas of cold water coastline, and continuous communication with the pilot to direct location while simultaneously observing and recording data were critical.
- Safety was a major concern in this work because of the distance from habitation or roads; rough local terrain; and cold water, and full survival equipment and contingency planning were mandatory.

A third project at Glacier Bay was field studies in the Dry Bay area to determine vegetation classification for a mapping project.

- This ecological field inventory work was performed with fly-in access, and daily fieldwork based out of a small cabin; it is described further in my description of botany & ecology experience.

University research projects:

My undergraduate, Master's, and PhD research projects were all stand-alone research projects I developed independently, and I arranged all project funding & grants, equipment, logistics, and fieldwork for these research projects, including foreign work in all, including Canada and several countries of the former USSR.

The **most logistically challenging** fieldwork I have initiated was my 1995 fieldwork of one month on the Ushkani Islands (in the center of Lake Baikal, Siberia, Russia) for my MA research.

- For this work all communication was made in Russian language, and required working closely with several different scientific and government conservation bodies to gain access to the site, as well as arranging research permits, transport, procurement of equipment and supplies, and field camp establishment in the challenging post-USSR economic depression of the mid-1990s.

The **most isolated** fieldwork I have done was my field research on Caribou Island, Ontario (the most remote lake island in the world; in the center of Lake Superior); the second half of the fieldwork began at Baikal.

- Here I was alone with only radio contact (and then possible only in favorable weather!) for 32 days while conducting field research for my MA thesis. Although only about 65 miles by air from the nearest mainland the famous Lake Superior weather delayed airplane travel to the island both to and from the island for nearly a week on both ends.
- I made all arrangements for air transport and communications equipment rental, and brought all field and camping equipment and other supplies for the expected month and an emergency reserve.
- While on these islands I successfully completed extensive unassisted vegetation, soils, geological, and zoological investigations to support my thesis research.

Other university research fieldwork included studies of post-Soviet nature reserves and conservation and administrative organizations in Belarus, Ukraine, & Russia (undergraduate), and landscape conservation planning in the Ukrainian Carpathian Mountains (PhD research).

Other research projects:

I was a participating botanist for a cooperative vegetation monitoring project between the US Forest Service, Grand Island National Recreation Area (Lake Superior), and the Michigan Natural Areas Council to assess management and scientific concerns on a newly established national recreational area. This work consisted of approximately one week of cabin-based fieldwork with a team of botanists and ecologists and access to field sites in smaller crews by foot, pickup truck, and canoe.

Additional & general skills:

General bush conditions:

- I have experience in essential backcountry “know-how” such as camp placement and layout, establishing camp routine and work schedules, effective radio and satellite communications including equipment use and antenna placement, proper and safe storage of food and other supplies, water safety, waste management, and other safety and survival techniques.
- I am adept at living and working in the field in remote and wild locations and with minimal “luxury” for extended periods, and have done so in Alaska, Siberia, Canada, the Carpathian and Crimean Mountains of Ukraine, and other locations.
- I have knowledge and skills in wilderness and field navigation by map, compass, landscape orienteering, the use and interpretation of aerial photography, and GPS.
- I have had training and experience in Alaska-related backcountry wildlife safety, including bear behavior and conflict avoidance, shotgun and pepper spray use, bear-resistant food and supply containers, insect and nuisance management, and wildlife non-interference guidelines.
- I arranged all project funding, logistics, and fieldwork for my undergraduate, master's, and PhD research.

Safety & emergency procedures:

- On (thankfully only) one field trip in remote Alaska several hundred km from the nearest road or village a crew member developed a medical emergency and had to return to Fairbanks for treatment. Over 24 hours I monitored her condition, and communicated by satphone and satellite text with pilots and FWS officials while we waited for weather conditions to improve so a plane safely could get in to evacuate here and she could receive help when back in town. Everything went successfully and she was able to participate in the next field hitch.
- I am very safety-oriented and careful in fieldwork to avoid splitting groups accidentally or losing track of crew members, in coordinating reliable and precise plans for regrouping locations and times when work needs to be done out of sight of other members, and in having established, accepted, and understood procedures to follow in the event of losing track of crew in the field so that there will be no question of how, where, or when to regroup.

Aviation, boats, and other field transport:

- I have arranged and contracted various types of transport: helicopters, planes, boats, off-road vehicles, and trucks in several countries to reach my research sites.
- I have no difficulties flying for extended periods in rough weather, elevation shifts, sharp turns and while collecting data or photography.
- At Glacier Bay NP I made 2-4 aerial surveys per week of 1.5-2.5 hours duration in Cessna 206 or 172 aircraft in reconnaissance flights along the southeastern Alaska coast to map and identify water vessel use patterns, and other travel to reach fieldwork sites in 2004.
- I have extensive experience in fixed-wing and rotary aircraft and coordination with pilots and safety officials to schedule and plan routes and destinations, and in the use of data collection techniques and communication with pilots and co-investigators in aircraft while conducting GPS mapping, aerial photography, and aerial identification of ground targets (vegetation, landscape features, ORV impacts, boats, and animals when participating in bear tagging).

- In FWS I have contracted and used Robinson R44 helicopters and several types of fixed-wing aircraft of field reconnaissance and access. My work for the USNPS and USDA involved Hughes MD 500, Bell 206, and occasional Eurocopter AS-350 A-Star helicopter reconnaissance and field camp transport.
- I have hired de Havilland Beaver and Otter floatplane aircraft to reach my MA field site in Lake Superior.
- I have had extensive additional time in single-engine fixed-wing aircraft as point-to-point transport in Alaska to/from paved and gravel airstrips and floatplanes.
- I have completed United States Office of Aviation Safety (OAS) Aviation Safety instruction 2002-2016 including “dunk training” (aircraft water crash survival & egress), and am familiar with standard safety protocols, loading complications, passenger protocols, and equipment for helicopters and fixed wing planes and low-altitude flights.
- I have operated inboard and outboard motorboats, canoes, and kayaks for fieldwork and field camp transport, including the challenging waters of Lake Superior, Glacier Bay and nearby areas, and the Yukon River.
- I have hiked and backpacked to field sites, including carrying all supplies needed for fieldwork and camp.

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