

Quickly Identify Research Activities That May be of Concern

Developed by Peter Landres, Tom Carlson, and Chris Barns
April 2010

A range of possible research activities is listed below to help managers and scientists to quickly identify activities that, from a wilderness perspective, may pose problems or concerns in a science proposal. By quickly identifying these potential concerns, this list is intended to facilitate a more timely dialogue between managers and scientists. For example, if a scientist is developing a proposal and sees an activity on this list that is likely to cause concern, then it behooves the scientist to start a dialogue with the local manager as soon as possible about this activity. Similarly, if the manager quickly identifies an activity that poses a concern, then he or she will be able to talk to the scientist as soon as possible about this concern.

The list of research activities given below is not a complete list, nor would such a list be possible given the variety of research subjects and study methods. Instead, this list is meant to be representative of the types of research activities that often are or may be proposed for inside wilderness. Possible research activities are grouped into relatively distinct categories reflecting the type of activity and its potential impact from a wilderness perspective.

From a wilderness perspective, there are two general classes of concerns or impacts from possible research activities. The first class would be activities that are prohibited in wilderness by Section 4(c) of the 1964 Wilderness Act, except if these activities can be shown to be “necessary to meet minimum requirements for the administration of the area for the purpose of this Act,” which is to preserve wilderness character. These prohibited activities include the use of motor vehicles, motorized equipment, mechanical transport, installations, structures, landing of aircraft, and temporary roads. In every case, it’s important for the manager to know the law and their agency policies and definitions for the prohibited activities or equipment. For example, agency definitions of motorized equipment typically include chain saws and generators but not GPS units, lap top computers, solar powered lights, etc. The definition of mechanical transport usually includes wagons and carts but not trail measuring wheels.

The second general class of concerns would be those research activities that degrade wilderness character even though they are not prohibited by Section 4(c) of the Wilderness Act. For example, releasing a biological control agent, even if no motors, installations, or mechanical transport are involved, clearly manipulates the “community of life” inside wilderness and therefore degrades the untrammeled quality of wilderness. Similarly, if the biological agent is a nonindigenous species then the natural quality would also be degraded.

Possible research activities span the spectrum from relatively benign to causing great concern if they violate Section 4(c) or otherwise degrade wilderness character. To facilitate recognizing this degree of concern, three coarse levels of concern are assigned to the groups of possible research activities, and symbols are used to represent these levels of concern so they can be readily identified. These symbols are meant to be used only as a first and rough approximation of the potential for wilderness-specific concerns of the activity depending on many factors, including the longevity of the activity, the intensity of its use, how frequently it will be used, the size of the area of use, and other activities occurring in the area. The three levels of concern and their symbols are:



OK, the activity typically does not pose a concern from the standpoint of Section 4(c) prohibited uses or degradation of the four qualities of wilderness character.



Caution, the activity may pose a concern depending on the many different factors described above or may adversely impact one or more qualities of wilderness character. Further analysis will be needed, and discussion between the manager and the scientist is warranted. A higher level of decision authority may be needed for approval.



Stop, the activity definitely poses a concern because it is prohibited under Section 4(c) or significantly degrades one or more of the four qualities of wilderness character, shown by the symbols 4c! and WC, respectively, and it may degrade both. This activity will need to undergo significant scrutiny and a clear and compelling justification will be required for its use. A high level of decision authority may be needed for approval.

Any activity on this list that seems benign may still pose a concern from a wilderness perspective, just as an activity may be justified even if it is prohibited by Section 4(c). For example, horses may be proposed to access a research site and typically this wouldn't be a concern. However, a variety of other factors affect the decision to allow such use, for example whether the area is heavily used by wilderness visitors, the season of use, and the number of other horses in the area at that time. In contrast, a proposal to use helicopters to access a research site would definitely be a concern. However, when other factors are considered, such as whether the research would provide great scientific benefit and help preserve wilderness character, whether the research could only be conducted inside wilderness, and whether the helicopter meets the "minimum necessary" legal requirement, use of the helicopter may be approved. In both these examples, the key point is that communication between the scientist and the manager should begin as soon as possible.

Possible Research Activities



Observing and recording, with instruments that are temporarily used only while the scientists are inside the wilderness, and nothing is left in the wilderness when the scientists leave

- a. Measure and record aspects of air, water, or soil
- b. Record animal occurrence and behavior
- c. Measure and record water flow, temperature, pressure
- d. Record the location, numbers, and behavior of people visiting the wilderness
- e. Use electronic equipment such as a laptop computer or hand-held data recorder
- f. Use a wheeled recording device to measure distance along a trail



Accessing a site inside the wilderness using non-motorized or non-mechanical means

- a. Walking
- b. Canoeing
- c. Skiing
- d. Using horses



Establishing a temporary plot inside the wilderness (the plot is established while the scientist is there but nothing is left in the wilderness when the scientist leaves the area)

- a. Measure plant abundance and diversity
- b. Measure small mammal occurrence and density with small mammal traps
- c. Use only GPS to monument a plot or site



Conducting a survey of visitors inside the wilderness

- a. Identifying visitor issues and concerns
- b. Measuring visitor preferences for management actions
- c. Assessing visitor reactions to user fees



Conducting an aerial survey inside the wilderness

- a. Radio tracking collared wildlife
- b. Counting wildlife
- c. Flying remote sensors



Manipulating an organism but not removing it

- a. Measure physiological attributes of plants, such as water conductance
- b. Handle animals to determine sex, weight, condition (e.g., mist nets for birds or bats, traps for mammals, electro-shocking fish)
- c. Mark animals by banding, tagging, collaring, or implanting to determine movement and population trends



Removing part of an organism

- a. Plants, e.g., lichen sample to determine air pollutants, leaves to determine nutrient status, tree ring cores or wedges, flowers to determine taxonomy, tissue for DNA, branches of shrubs or trees to count insects,
- b. Animals, e.g., blood, tissue, hair, or toes (these samples could be taken actively, such as after trapping an animal, or passively, such as by using hair snares)



Accessing a site inside the wilderness using motorized equipment or a means of mechanical transport

- a. Bicycle
- b. Parachuting or paragliding
- c. Snowmobile or all terrain vehicle
- d. Helicopter or fixed wing aircraft



Using permanently installed instruments or structures to record data even though the instruments are non-motorized or non-mechanical (permanent is defined by agency policy and generally means that something is left in an area for more than one field season)

- a. Data loggers (of any size)
- b. Meteorological stations
- c. Solar panels
- d. Satellite transmitters
- e. Seismographs
- f. Gauging stations or weirs (this has a greater impact because it also alters water flow)
- g. Soil probes
- h. Geoprobes
- i. Air quality monitoring stations
- j. Surveillance camera to record visitor numbers or behavior
- k. Fixed camera used to record wildlife or for other biological monitoring purposes



Using instruments, tools, or any other equipment that is motorized or a means of mechanical transport to collect or record data

- a. Battery or gas powered drills for sediment cores
- b. Battery or gas powered drills for tree rings
- c. Chain saw for tree rings
- d. Wheeled cart used to remove materials
- e. Helicopter used to remove materials



Establishing a permanent plot with physical reference points that monument a plot inside the wilderness (permanent is defined by agency policy and generally means that something is left in an area for more than one field season)

- a. Stakes or pins/nails in the ground to mark the location of the plot (the number and type of material are important considerations)
- b. Tags or other marking of the ground or trees to mark the location of the plot (number and type of material)
- c. Fencing, flagging or any other material to mark the location of the plot
- d. Blazing tree bark or piling rock cairns or any other manipulation of natural objects to mark the plot



Removing an organism or abiotic element from inside the wilderness

- a. Collect plants or animals or soil or rocks
- b. Pitfall traps or Malaise traps for insects



Killing organisms and leaving them inside the wilderness

- a. Use pitfall traps for small mammals or insects (discarding them after sorting and counting)
- b. Use rotenone or other chemical treatment in water to kill undesired fish
- c. Use herbicide to kill plants



Modifying a site inside wilderness

- a. Dig soil pits
- b. Light fire
- c. Keep animals out of an area or keep them inside an area with fences or any other means



Introducing organisms or abiotic elements

- a. Add things directly to soil (e.g., chemicals or electrical current) or plants (e.g., nutrients or gas such as CO₂)
- b. Add biocontrol species or agents
- c. Add an endangered or otherwise listed or sensitive species