Possible Research Activities and Wilderness Character

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 (Untrammeled, Natural, Undeveloped, and Opportunities for Solitude or Primitive and Unconfined recreation.

1. Observing and recording with instruments that are temporarily used 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

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

a. Walking

b. Canoeing

c. Skiing

d. Snowshoeing

3. Establishing a temporary plot inside the wilderness, but with nothing left behind.

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

Cautionary - the activity may pose a concern depending on many different factors 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.

1. 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

2. Conducting an aerial survey inside the wilderness

a. Radio tracking collared wildlife

b. Counting wildlife

c. Flying remote sensors

3. 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

4. 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)

4C Alert - 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, 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.

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

a. Bicycle or dirtbike

b. Parachuting or paragliding

c. Snowmobile or all terrain vehicle

d. Helicopter or fixed wing aircraft

2. 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

3. 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

Wilderness Character Alert

1. 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

3. Removing an organism or abiotic element from inside the wilderness

a. Collect plants or animals or soil or rocks – depends on amount

b. Pitfall traps or Malaise traps for insects

4. Killing organisms and leaving them inside the wilderness

a. Use pitfall traps for small smalls 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

5. 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

6. 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

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4(c) of the 1964 Wilderness Act Reference:

USE OF WILDERNESS AREAS

Sec. 4. (a) The purposes of this Act are hereby declared to be within and supplemental to the purposes for which national forests and units of the national park and national wildlife refuge systems are established and administered and –

PROHIBITION OF CERTAIN USES

(c) Except as specifically provided for in this Act, and subject to existing private rights, there shall be no commercial enterprise and no permanent road within any wilderness area designated by this Act and, except as necessary to meet *minimum requirements for the administration of the area* for the purpose of this Act (including measures required in emergencies involving the health and safety of persons within the area), there shall be no temporary road, no use of motor vehicles, motorized equipment or motorboats, no landing of aircraft, no other form of mechanical transport, and no structure or installation within any such area.

Wilderness Character Reference:

Section 2(c) Definition of Wilderness in the 1964 Wilderness Act expresses congressional intent for the meaning of wilderness character (Rohlf and Honnold 1988, McCloskey 1999, Scott 2002). The Forest Service national framework (Landres and others 2005) applies this legal definition to identify four specific qualities of wilderness that make the idealized description of wilderness character relevant and tangible to forest planning, management, and monitoring:

- *Untrammeled* — The Wilderness Act states that wilderness is "an area where the earth and its community of life are untrammeled by man," and "generally appears to have been affected primarily by the forces of nature." In short, wilderness is essentially unhindered and free from modern human control or manipulation. This quality is degraded by modern human activities or actions that control or manipulate the components or processes of ecological systems inside the wilderness.

- *Natural* — The Wilderness Act states that wilderness is "protected and managed so as to preserve its natural conditions." In short, wilderness ecological systems are substantially free from the effects of modern civilization. This quality is degraded by intended or unintended effects of modern people on the ecological systems inside the wilderness since the area was designated.

- *Undeveloped* — The Wilderness Act states that wilderness is "an area of undeveloped Federal land retaining its primeval character and influence, without permanent improvements or human habitation," "where man himself is a visitor who does not remain" and "with the imprint of man's work substantially unnoticeable." This quality is degraded by the presence of structures, installations, habitations, and other evidence of modern human presence or occupation such as the use of motorized equipment or mechanical transport.

- *Solitude or a primitive and unconfined type of recreation* — The Wilderness Act states that wilderness has "outstanding opportunities for solitude or a primitive and unconfined type of recreation." This quality is about the *opportunity* for people to experience wilderness; it is not directly about visitor experiences per se. This quality is degraded by settings that reduce these opportunities, such as visitor encounters, signs of modern civilization, recreation facilities, and management restrictions on visitor behavior.

These four qualities reinforce one another and together comprise an approximation of wilderness character for planning, stewardship, and monitoring. All four qualities are equally important and none is held in higher or lower regard than the others. A detailed discussion of the historical and scientific support, and specific concerns, for each of the four qualities is provided in the Forest Service national wilderness character monitoring Framework (Landres and others 2005), and is summarized in section *4. Framework For Wilderness Character Monitoring.*