Idaho and Southwestern Montana Greater Sage-Grouse

Proposed Land Use Plan Amendment and Final Environmental Impact Statement

Volume III

US Department of the Interior
Bureau of Land Management

US Department of Agriculture
Forest Service

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BLM

Forest Service

The Bureau of Land Management's multiple-use mission is to sustain the health and productivity of the public lands for the use and enjoyment of present and future generations. The Bureau accomplishes this by managing such activities as outdoor recreation, livestock grazing, mineral development, and energy production, and by conserving natural, historical, cultural, and other resources on public lands.

The Forest Service mission is to sustain the health, diversity, and productivity of the Nation's forests and grasslands to meet the needs of present and future generations.

Cover Photo: Steve Ting

Appendix A

Chapter 2 Maps

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A. Chapter 2 Maps

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2-41	Alternative A: Wind and Solar Development Allocations

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Figure 2-1
Idaho-SW Montana Proposed Plan/Final EIS
Conservation Areas

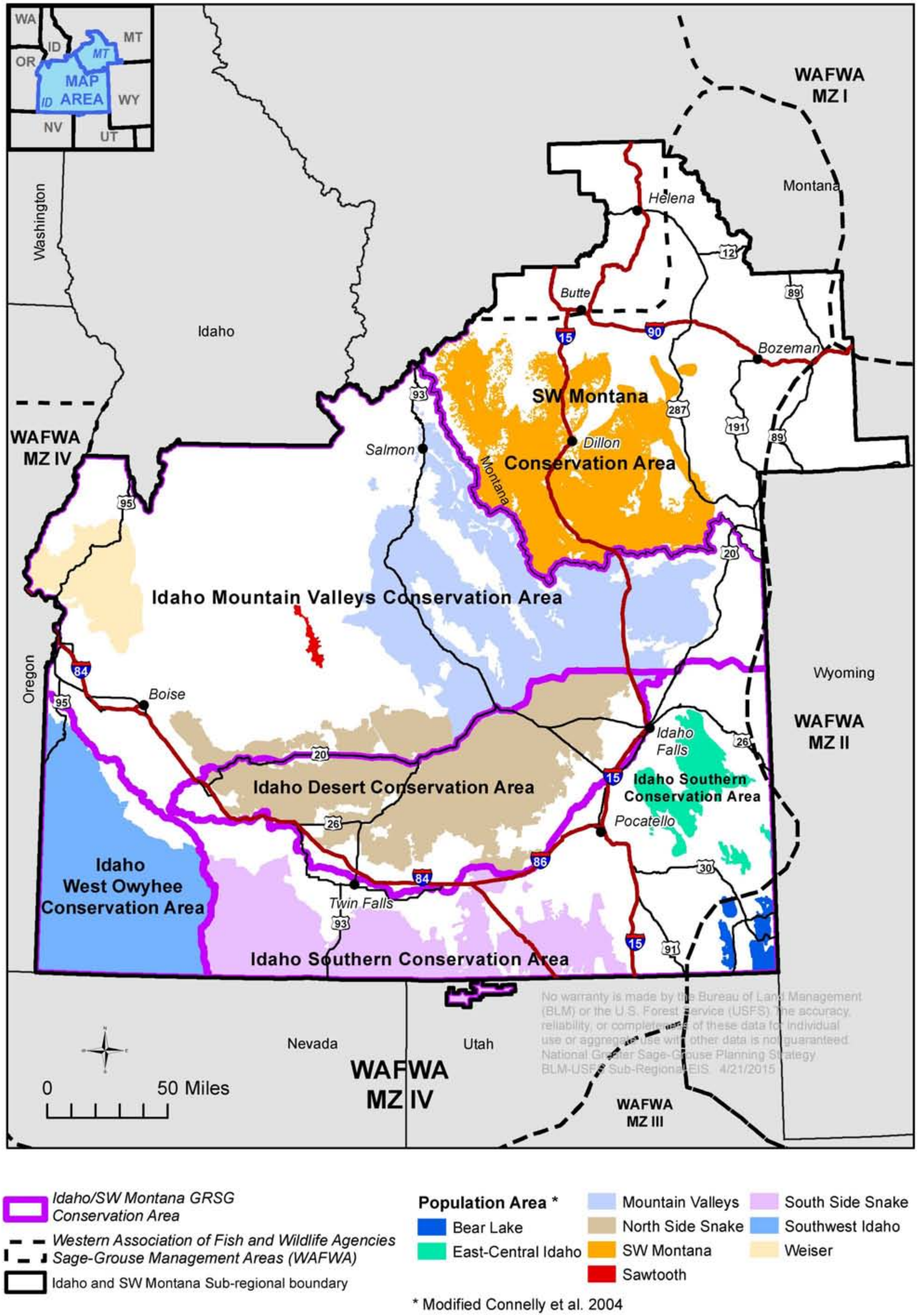


Figure 2-2
Idaho-SW Montana Proposed Plan/Final EIS
Habitat Management Areas

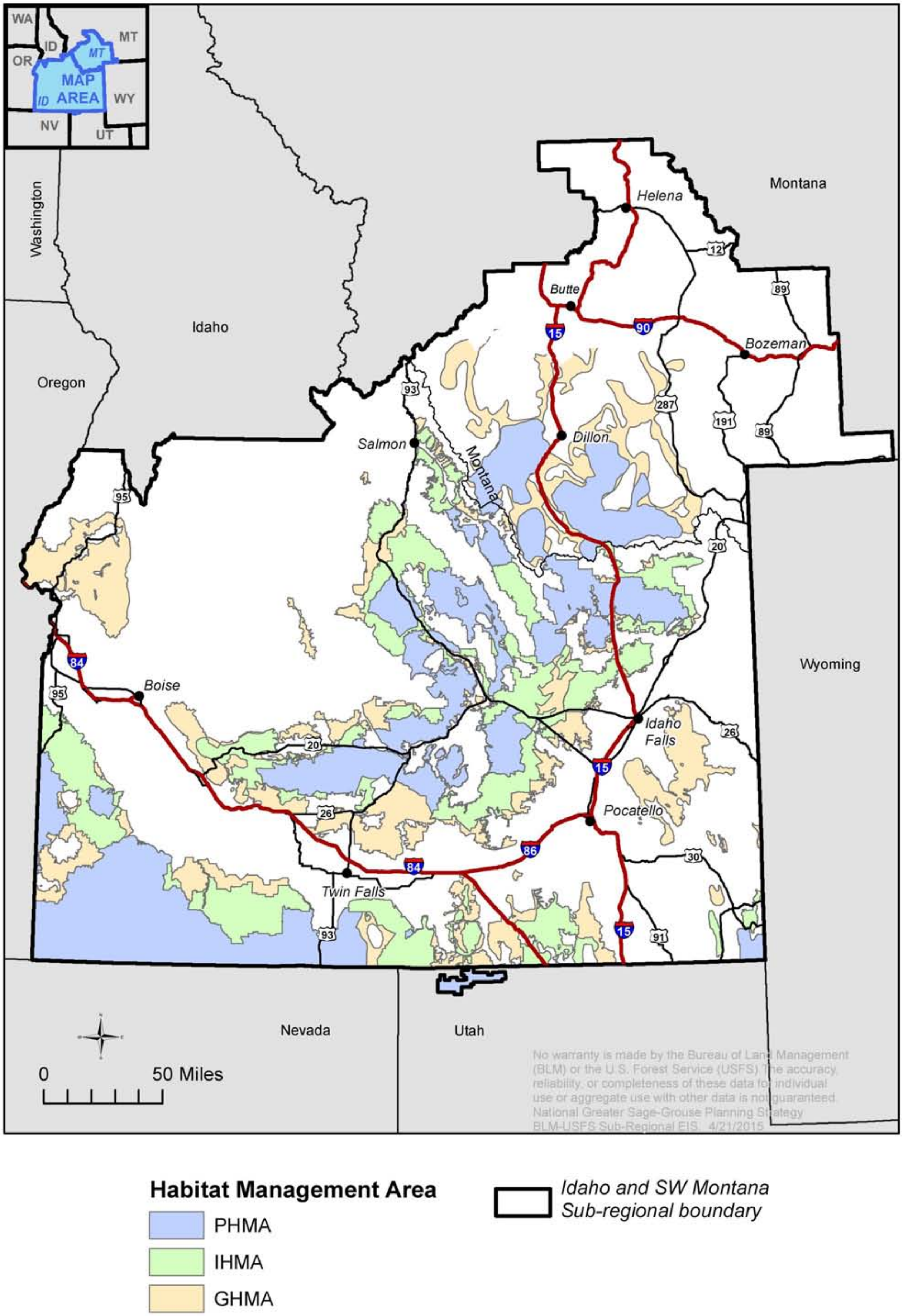


Figure 2-3
Idaho-SW Montana Proposed Plan/Final EIS
Sagebrush Focal Areas

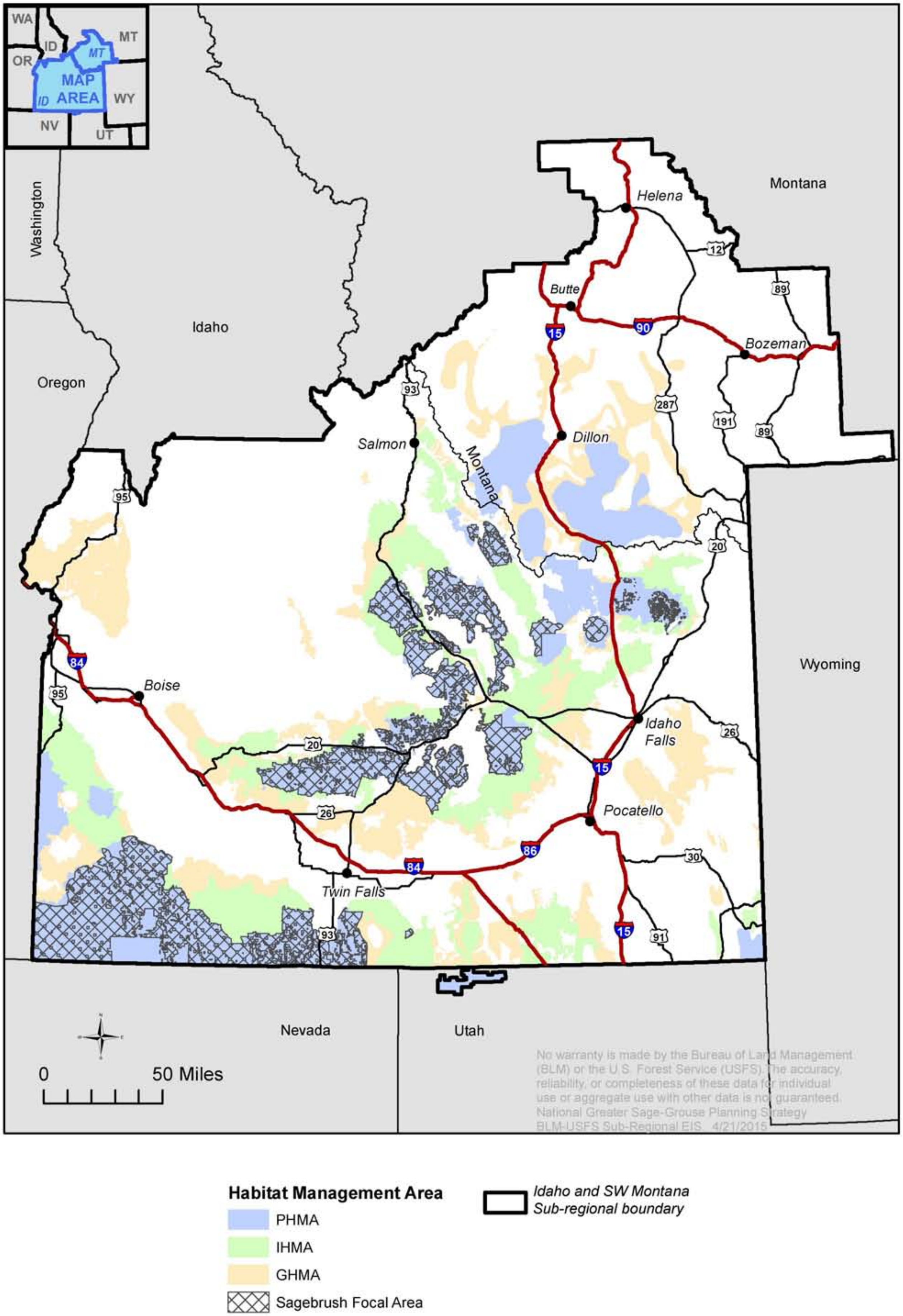


Figure 2-4
Idaho-SW Montana Proposed Plan/Final EIS
Wind and Solar Allocations

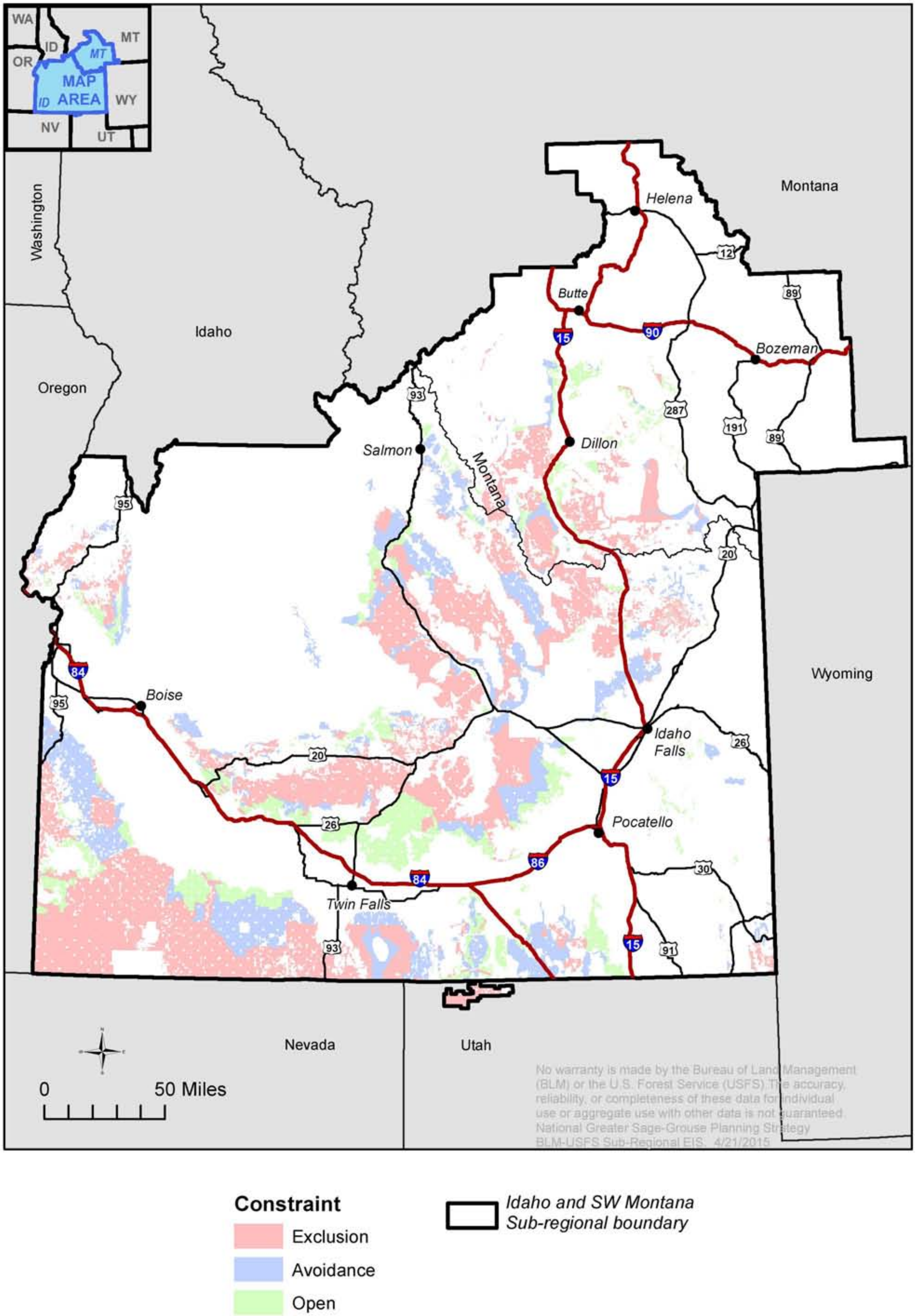
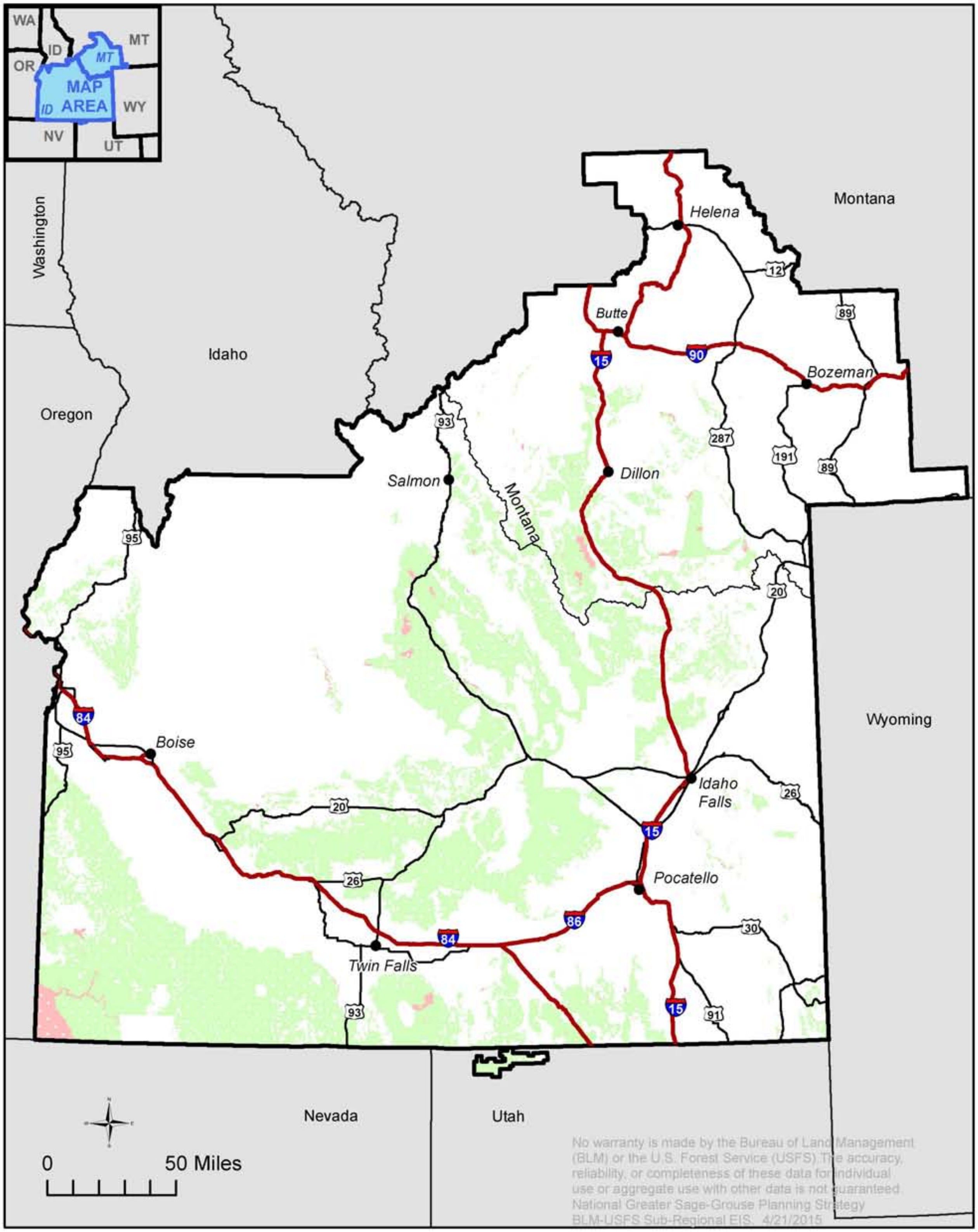


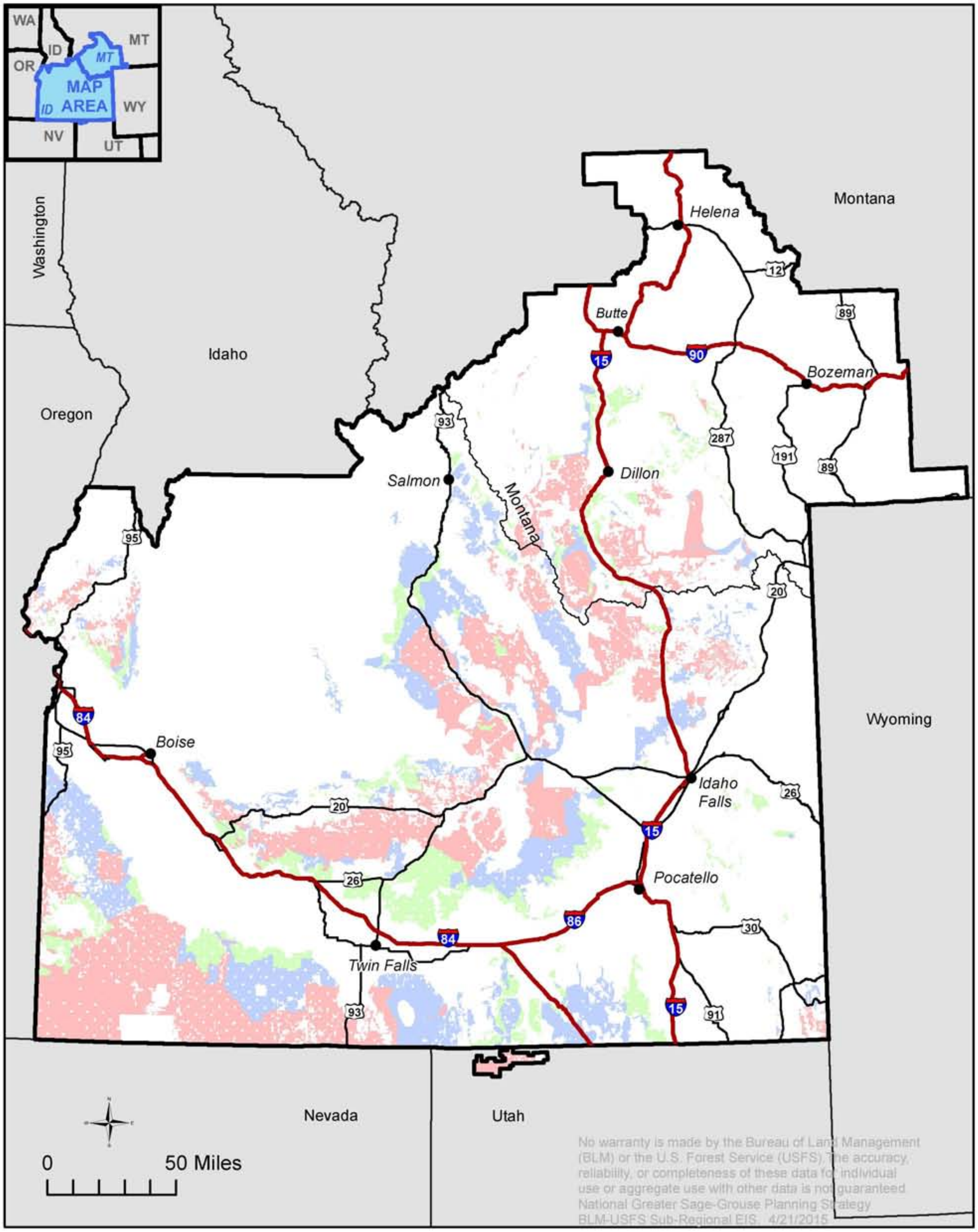
Figure 2-5
Idaho-SW Montana Proposed Plan/Final EIS
Available and Unavailable to Grazing



Availability to Grazing

- Available
- Unavailable
- *Idaho and SW Montana Sub-regional boundary*

Figure 2-6
Idaho-SW Montana Proposed Plan/FinalEIS
Commercial Service Airport and Landfill Development Allocations



Constraint

Exclusion

Avoidance

Open

Idaho and SW Montana Sub-regional boundary

Figure 2-7
Idaho-SW Montana Proposed Plan/Final EIS
Utility Corridors Designation

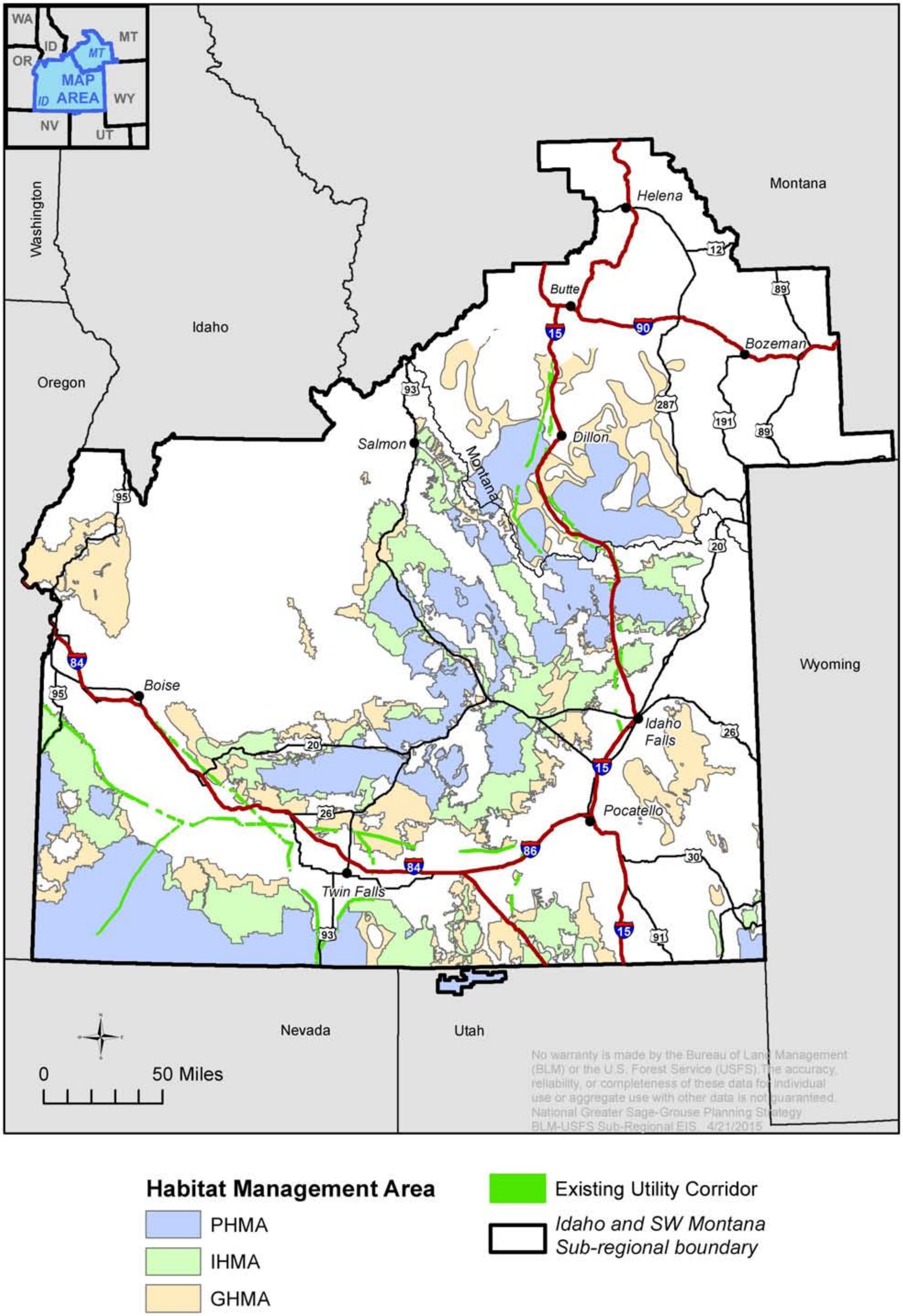
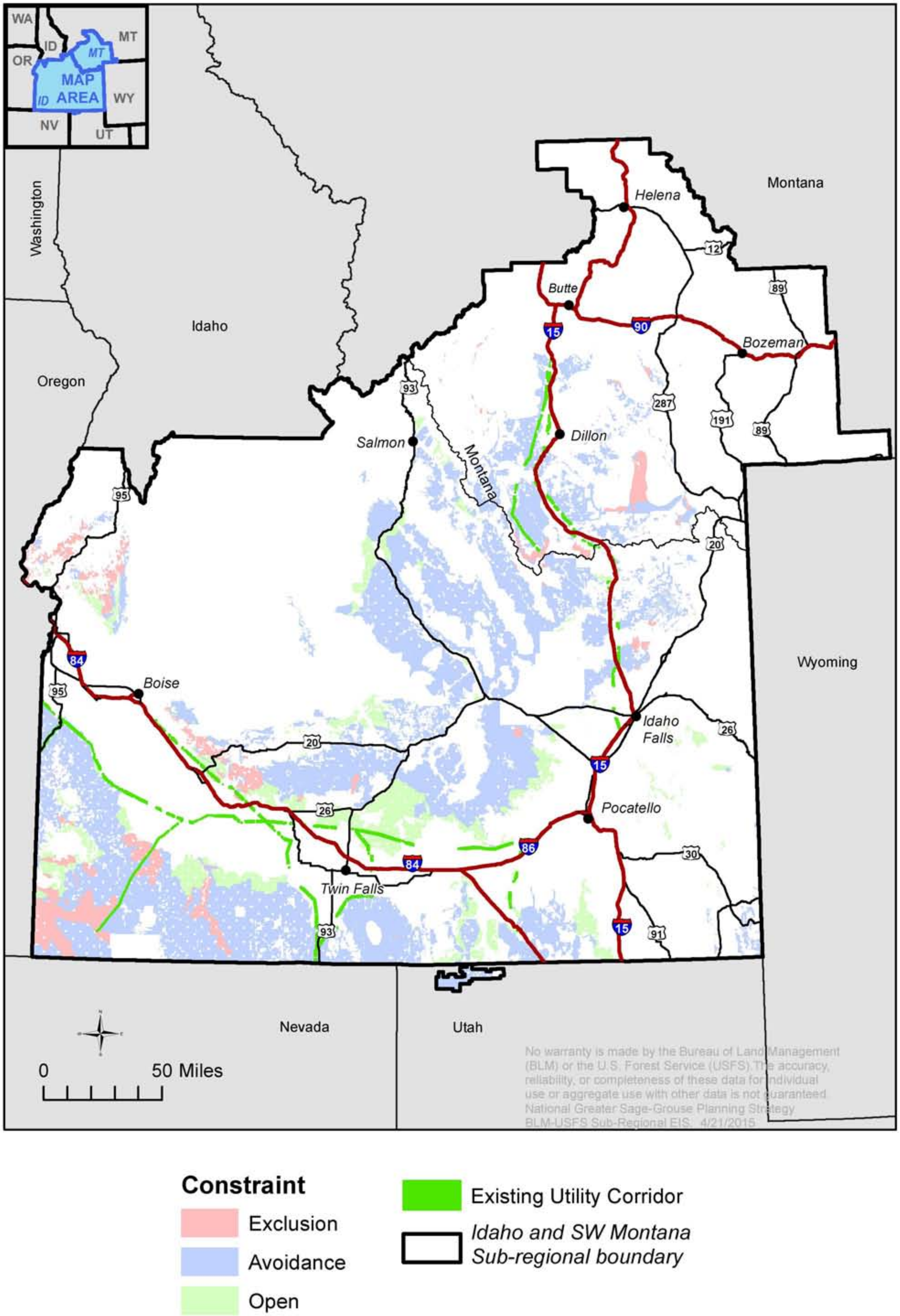


Figure 2-8
Idaho-SW Montana Proposed Plan/Final EIS
Major Right-of-Way Development Allocations



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Idaho-SW Montana Proposed Plan/Final EIS
Minor Right-of-Way Development Allocations

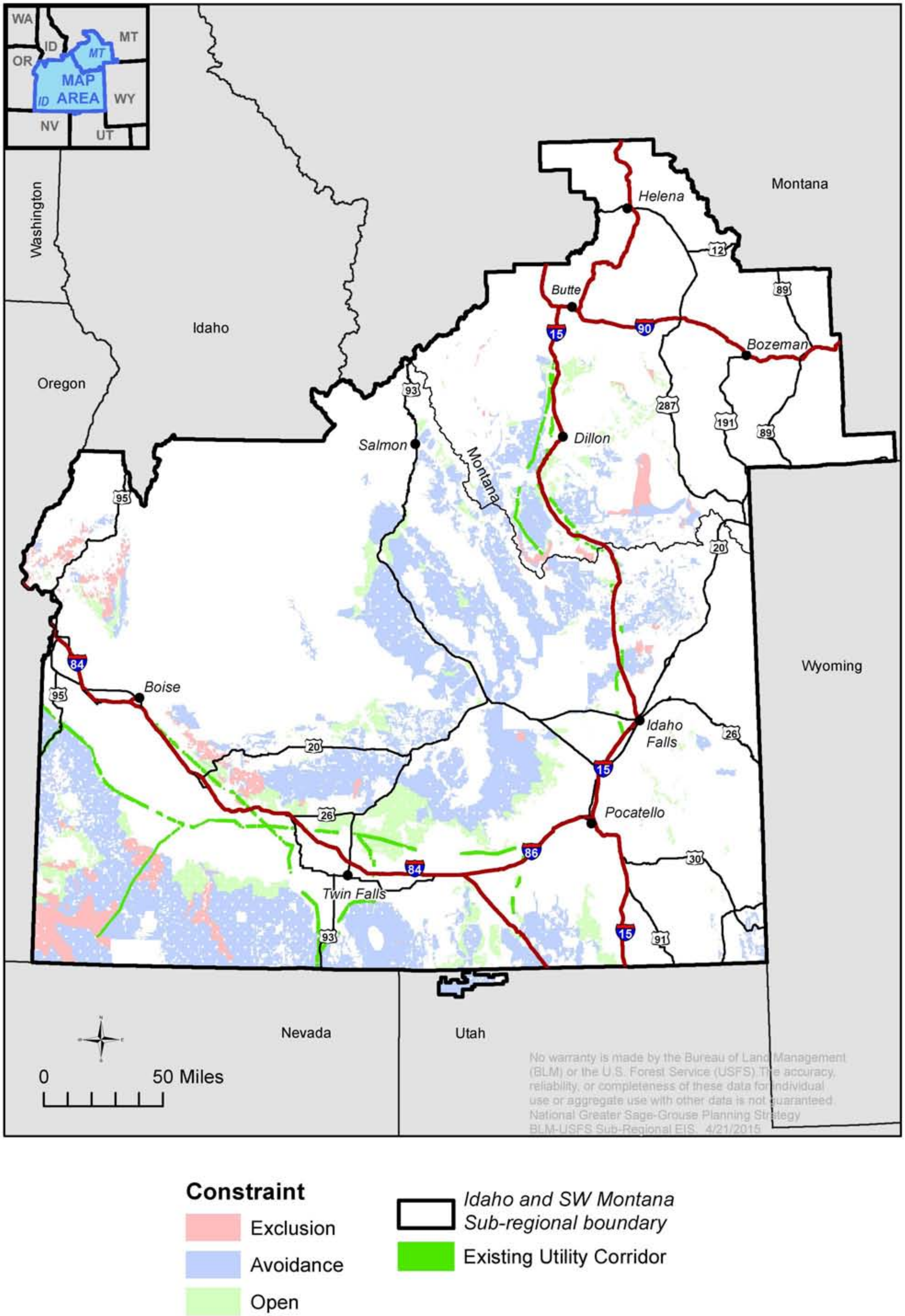
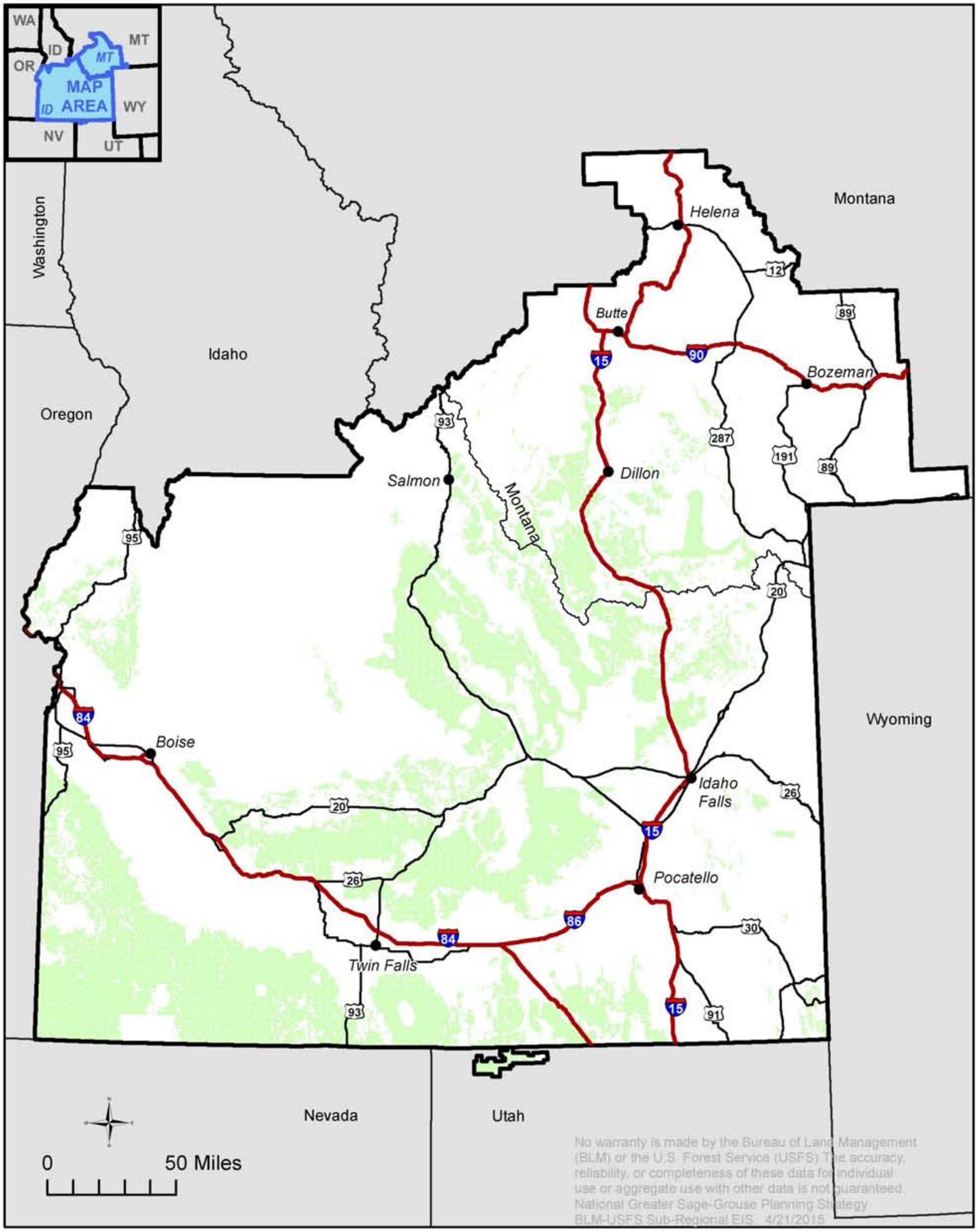


Figure 2-10
Idaho-SW Montana Proposed Plan/Final EIS
Land Tenure Designations



Land Tenure Designation

Retention

Idaho and SW Montana Sub-regional boundary

No Disposal in Habitat

Figure 2-11
Idaho-SW Montana Proposed Plan/Final EIS
Fluid Mineral Resource Allocations Oil and Gas

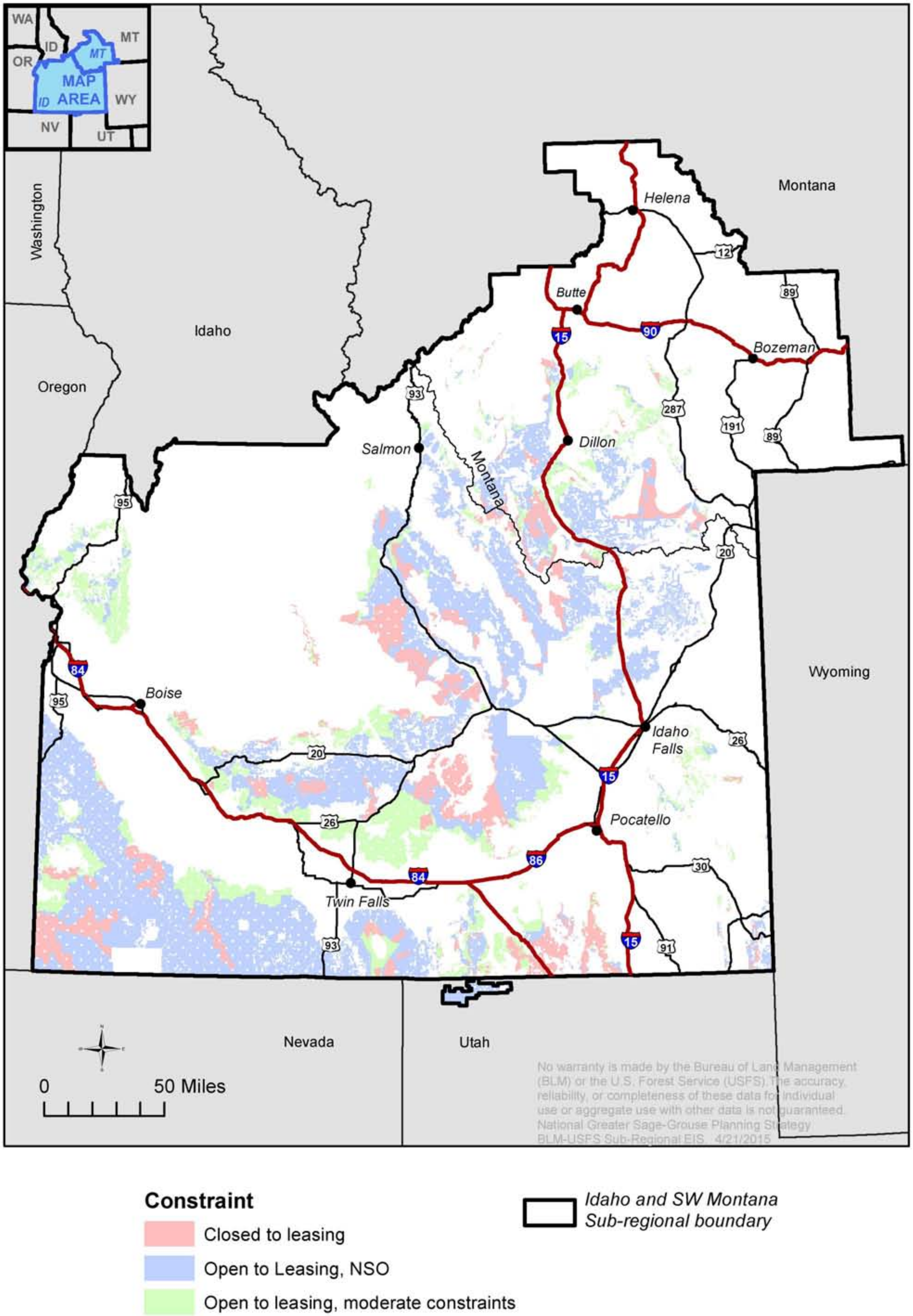
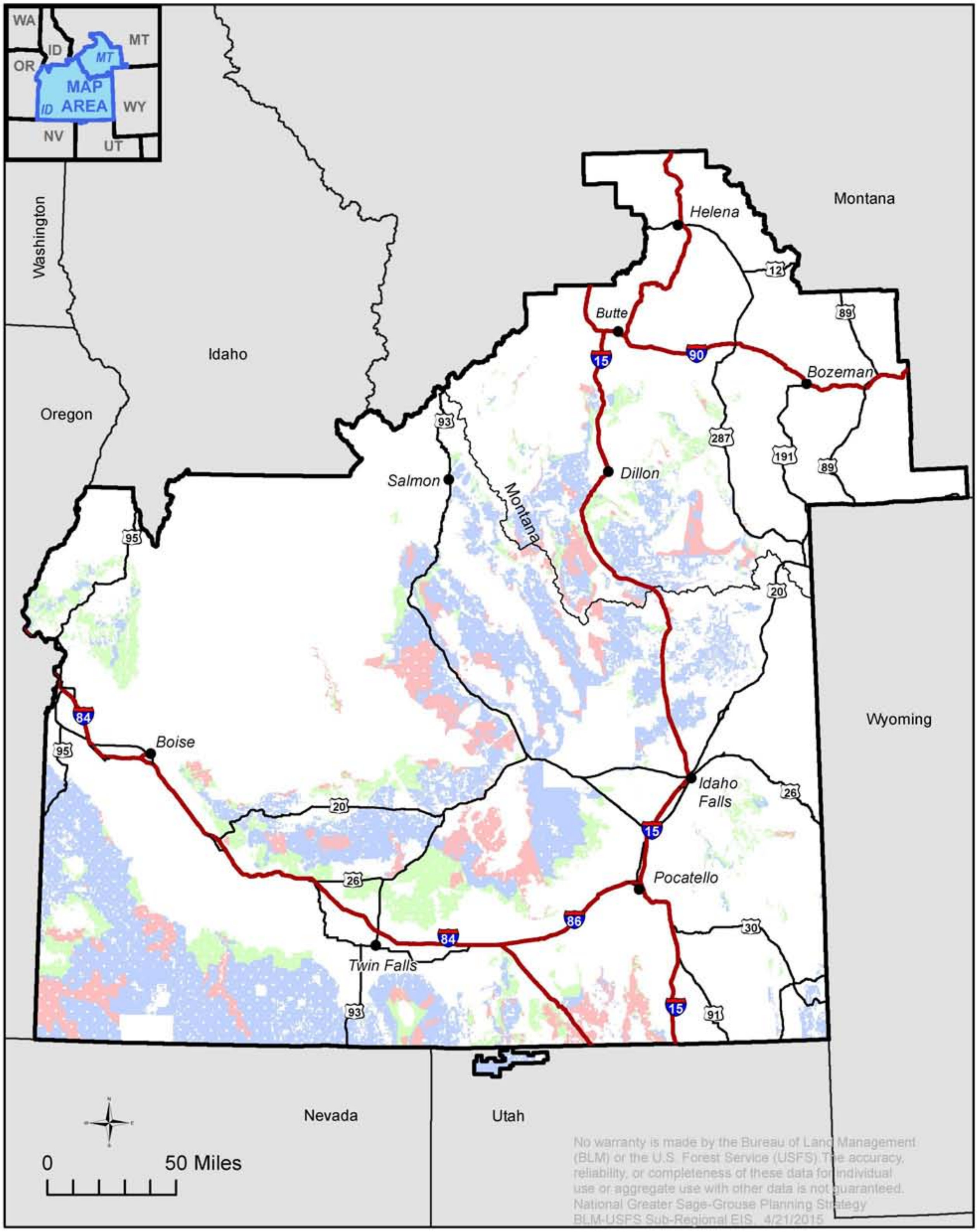


Figure 2-12
Idaho-SW Montana Proposed Plan/Final EIS
Fluid Mineral Resource Allocations Geothermal



Constraint

- Closed to leasing
- Open to leasing, NSO
- Open to leasing, moderate constraints

Idaho and SW Montana Sub-regional boundary

Figure 2-13
Idaho-SW Montana Proposed Plan/Final EIS
Locatable Minerals Withdrawals

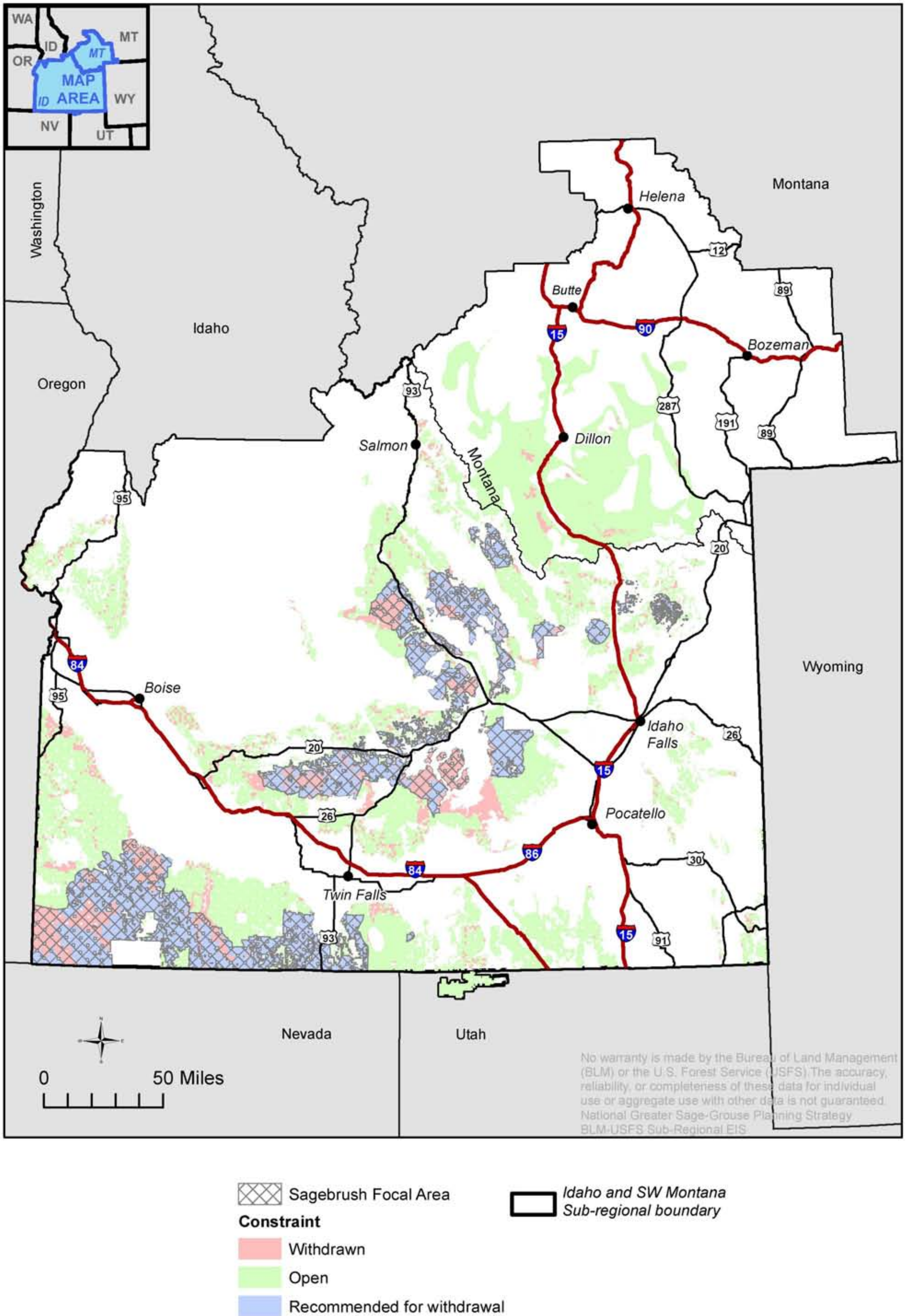


Figure 2-14
Idaho-SW Montana Proposed Plan/Final EIS
Nonenergy Leasable Resource Allocations

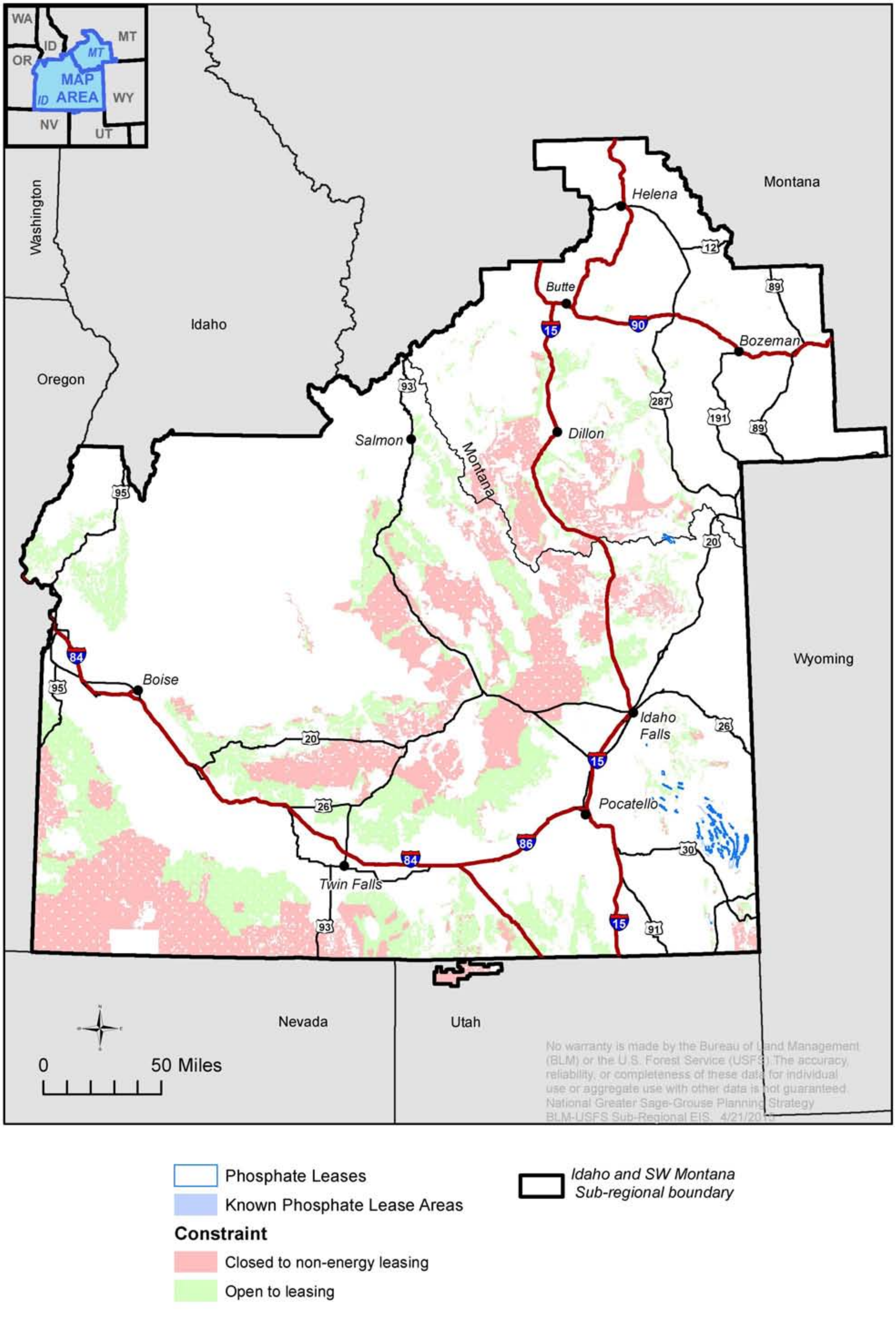
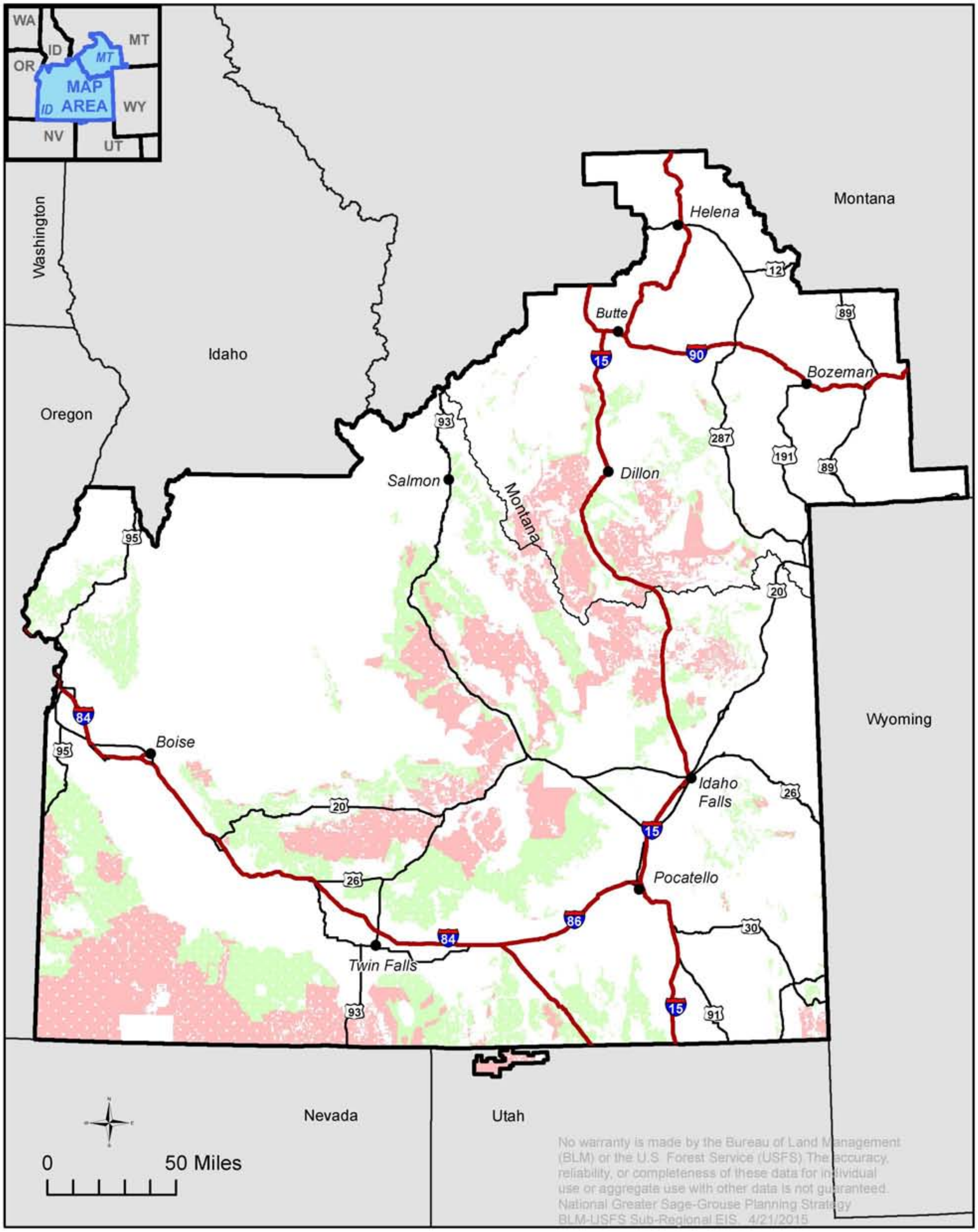


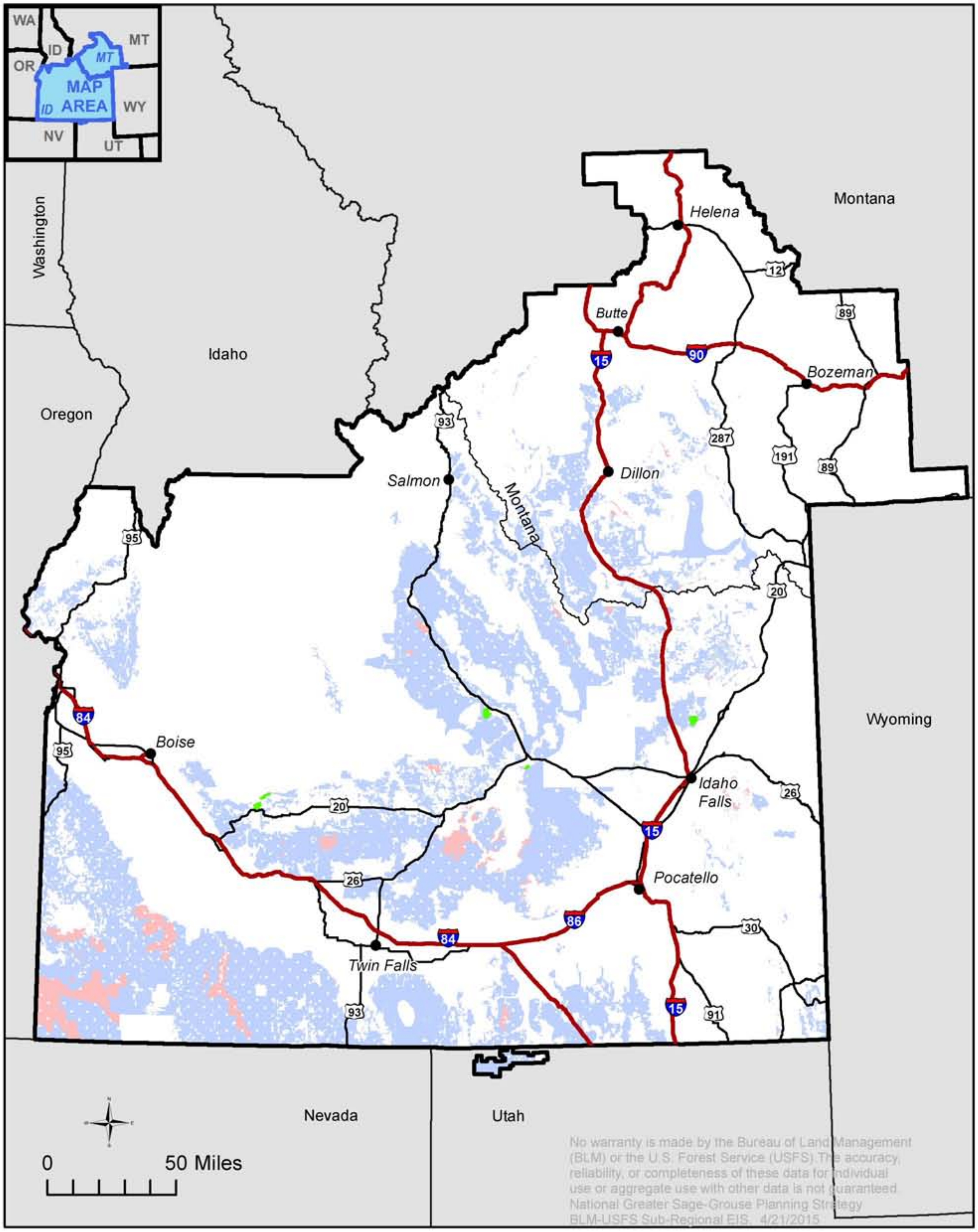
Figure 2-15
Idaho-SW Montana Proposed Plan/Final EIS
Saleable (Mineral Materials) Allocations



Constraint

- Closed to Saleable (Mineral Material Disposal)
- Open
- *Idaho and SW Montana Sub-regional boundary*

Figure 2-16
Idaho-SW Montana Proposed Plan/Final EIS
Travel Management Allocations



Travel Management Designation

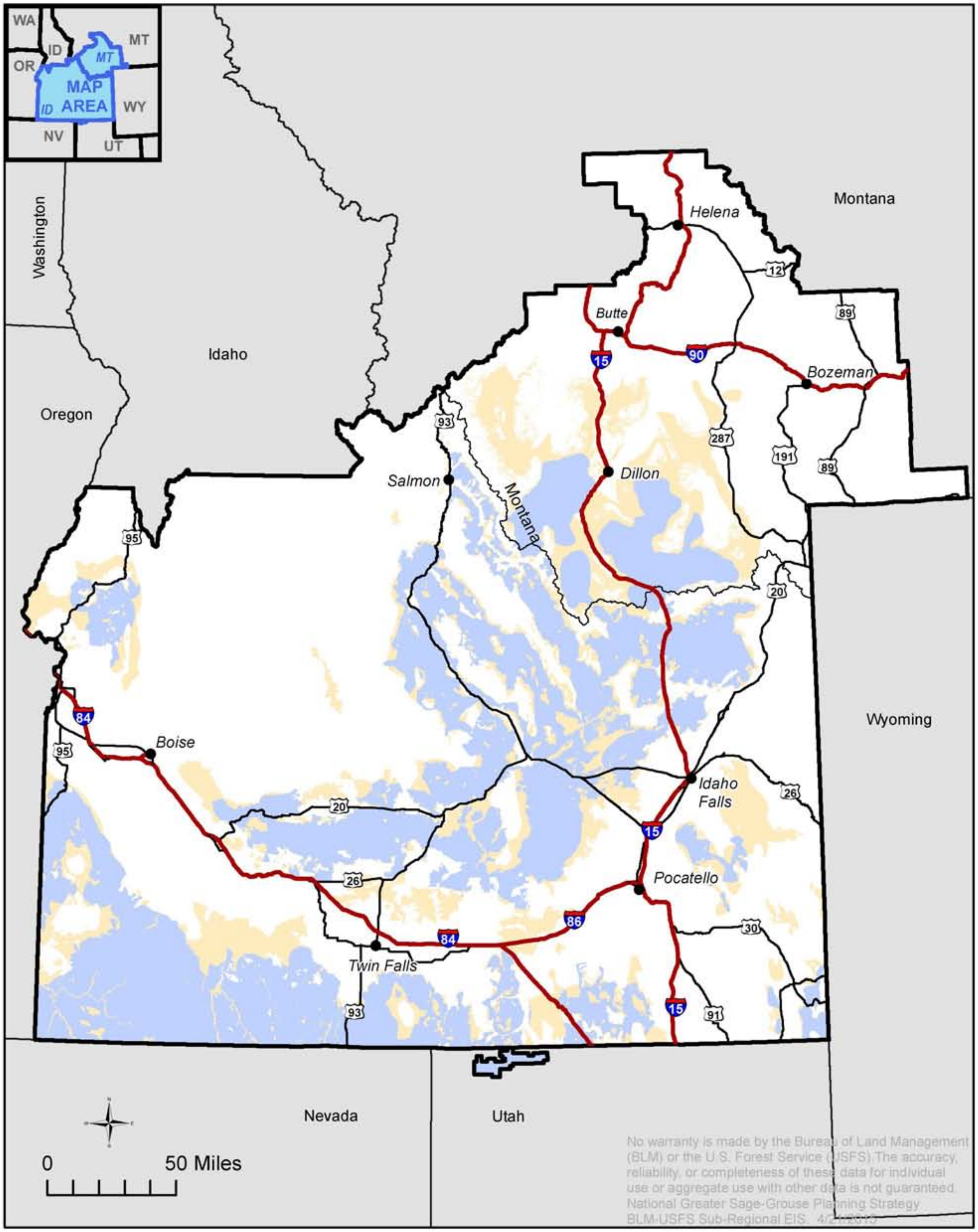
CLOSED

LIMITED

OPEN

Idaho and SW Montana Sub-regional boundary

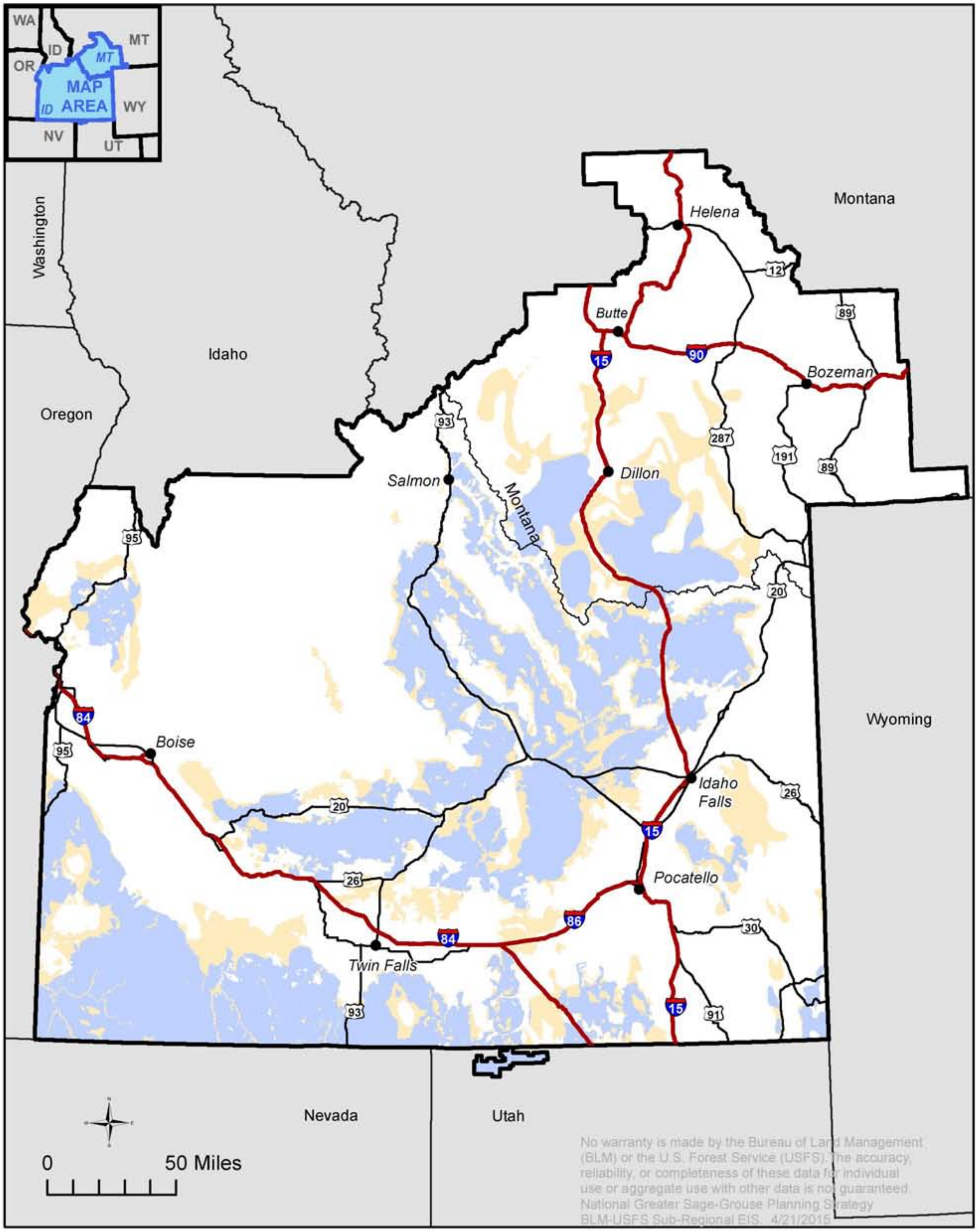
Figure 2-17
Alternative A: Existing Habitat with Preliminary Priority and General Habitat



Preliminary Habitat Management Area

- Priority
- General
- *Idaho and SW Montana Sub-regional boundary*

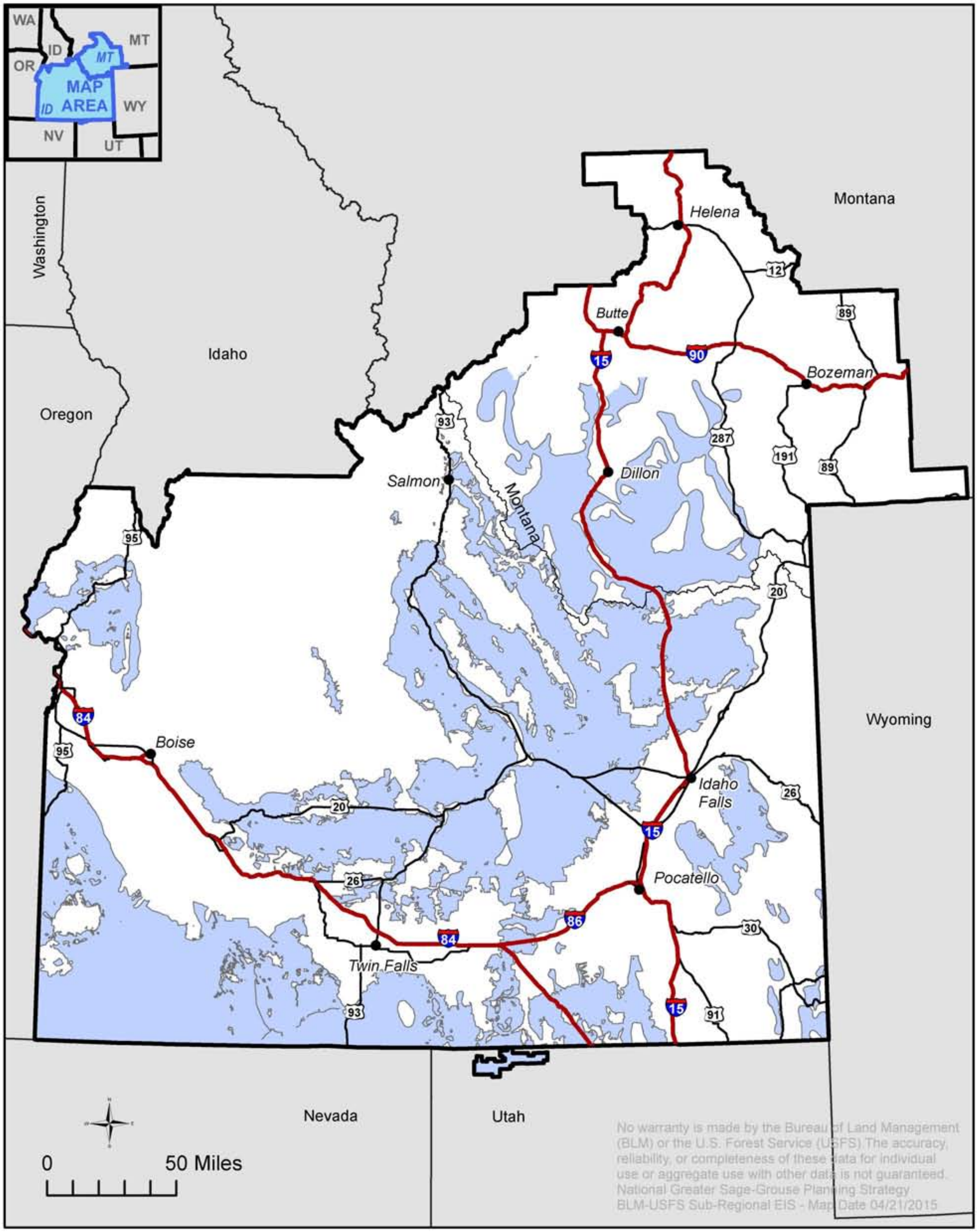
Figure 2-18
Alternative B: Habitat Management Areas



Habitat Management Areas

- PHMA
- GHMA
- *Idaho and SW Montana Sub-regional boundary*

Figure 2-19
Alternative C: Habitat Management Areas



Habitat Management Areas

PHMA

Idaho and SW Montana Sub-regional boundary

Figure 2-20
Alternative D: Habitat Management Areas

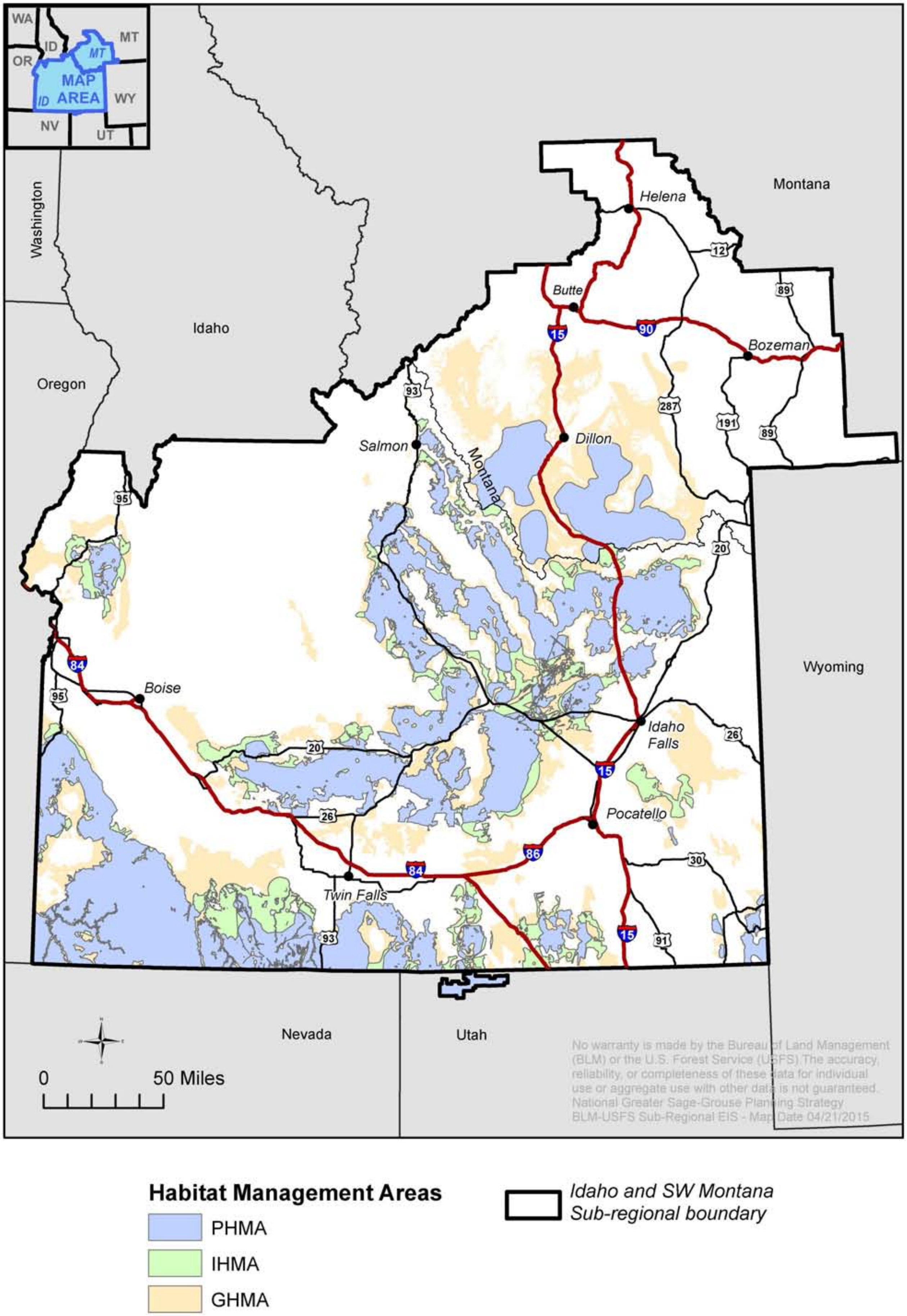
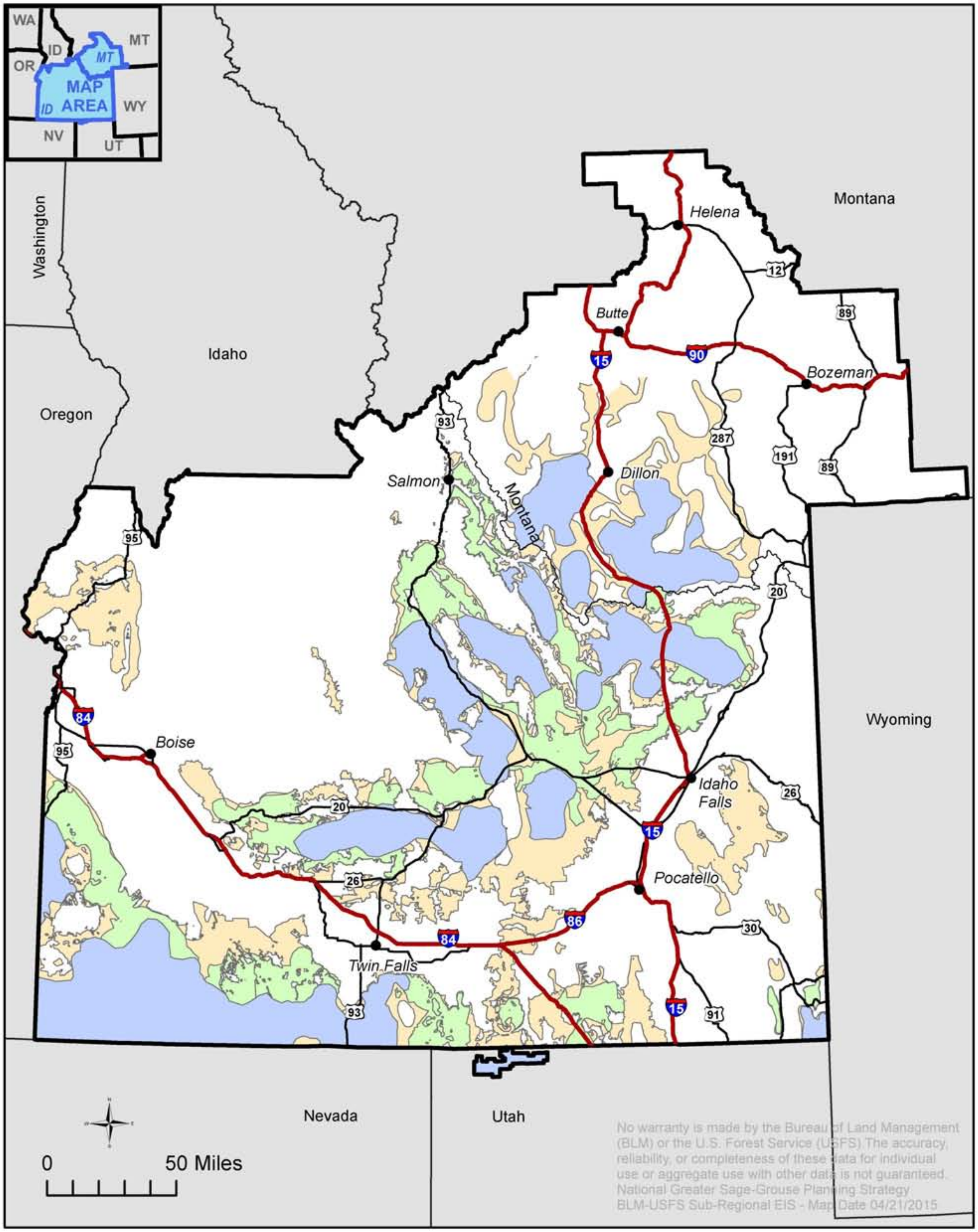


Figure 2-21
Alternative E: Habitat Management Areas



Habitat Management Area

- PHMA
- IHMA
- GHMA

Idaho and SW Montana Sub-regional boundary

Figure 2-22
Alternative F: Habitat Management Areas

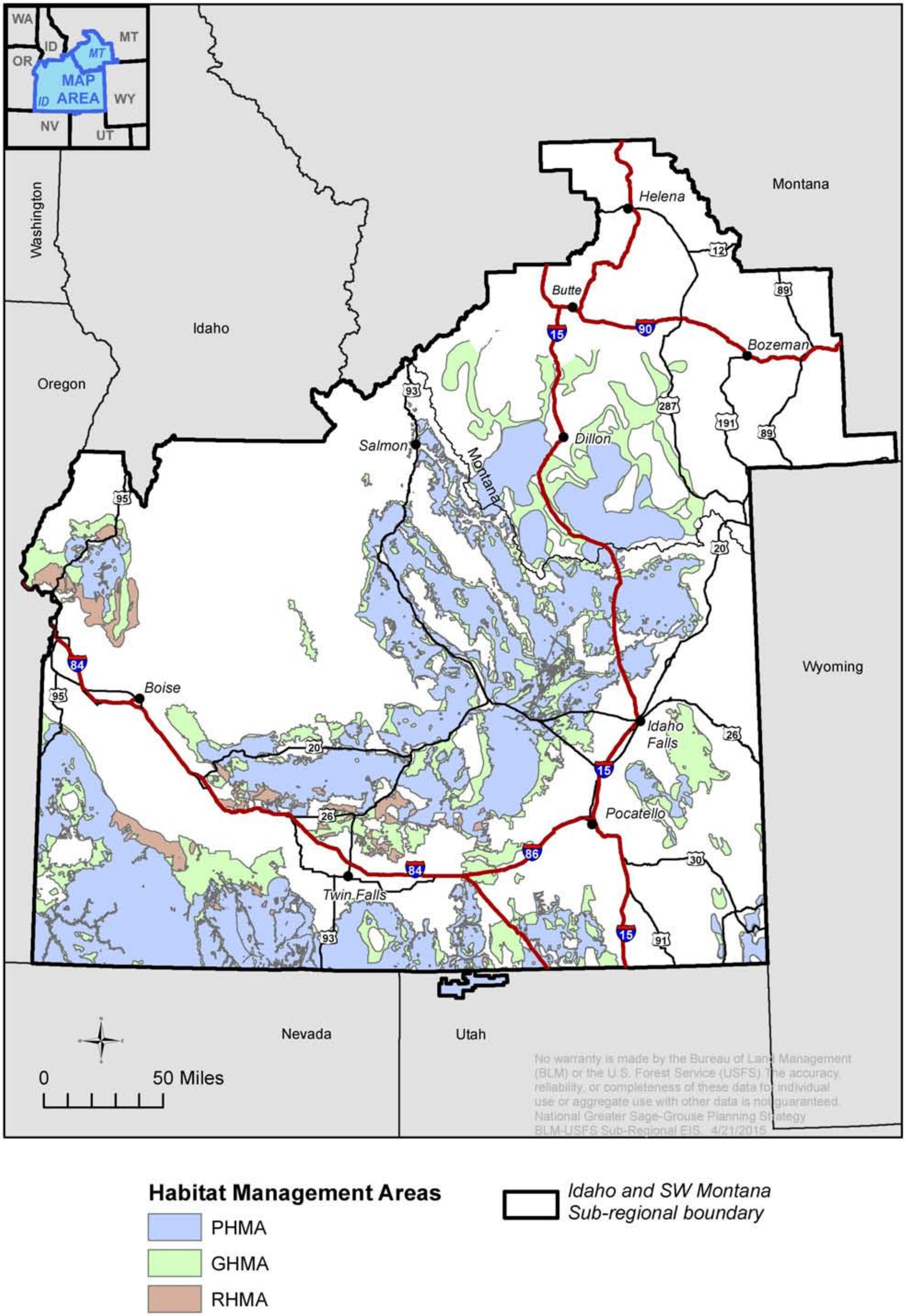


Figure 2-23
Alternative A: Available and Unavailable to Grazing

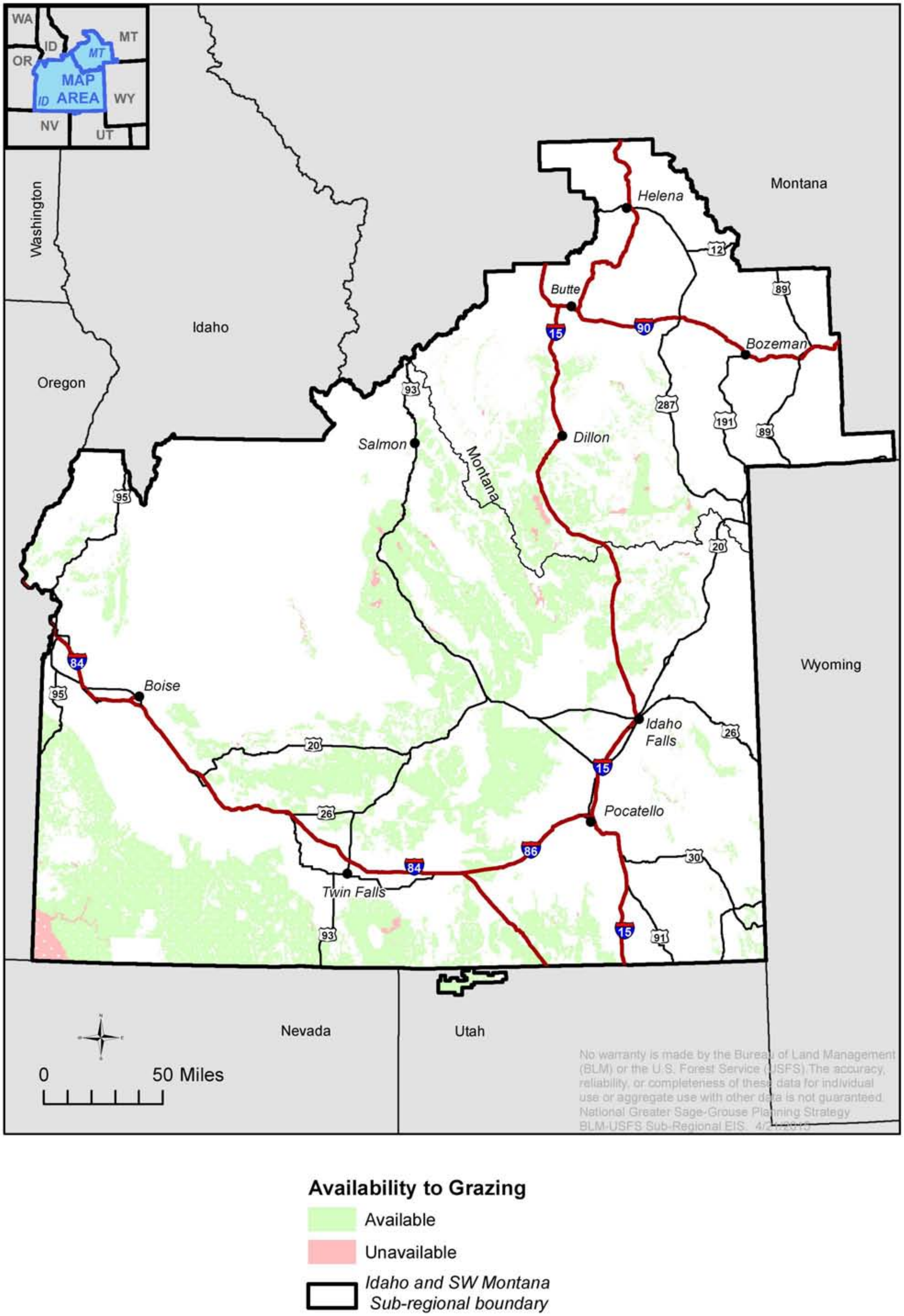
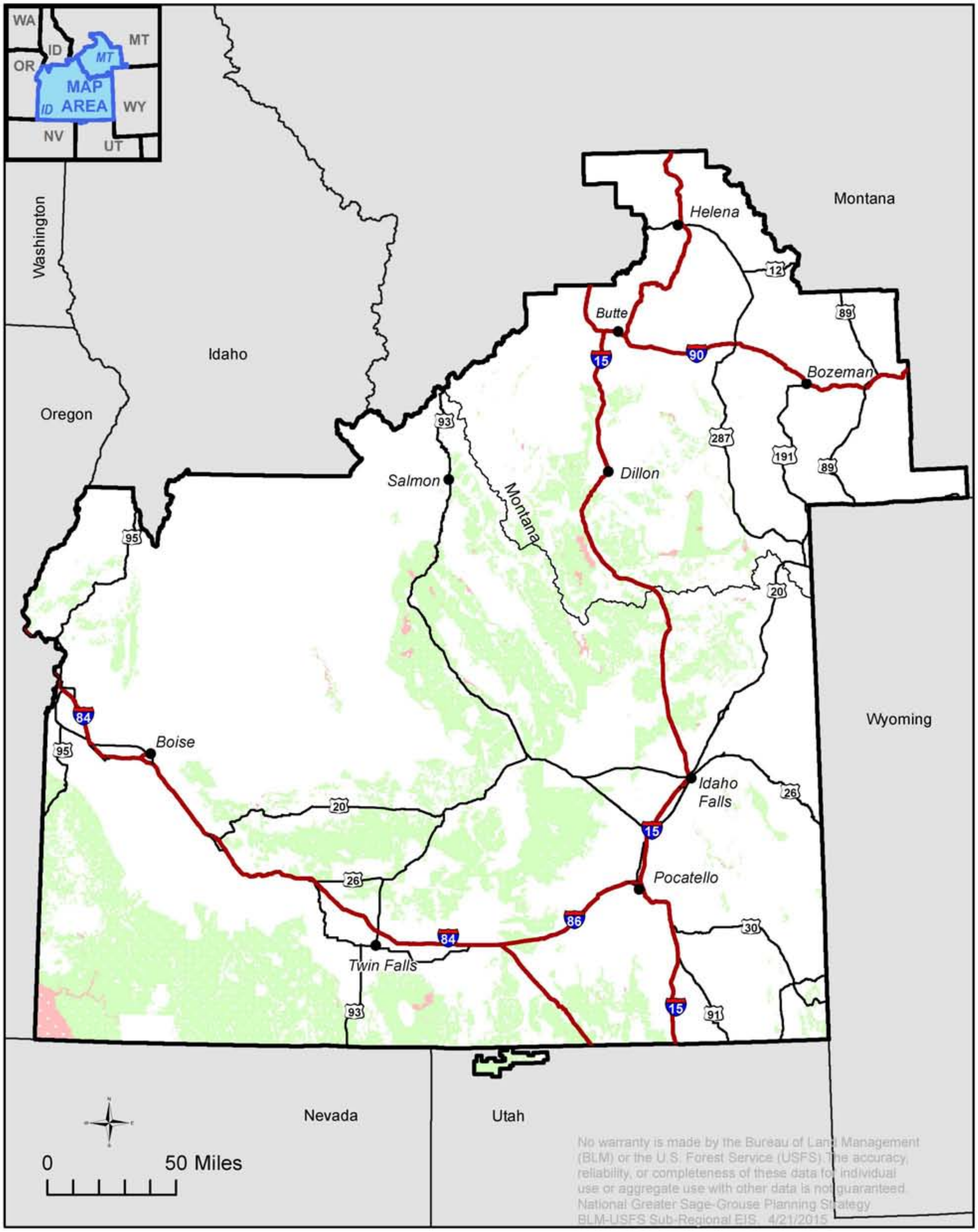


Figure 2-24
Alternative B: Available and Unavailable to Grazing



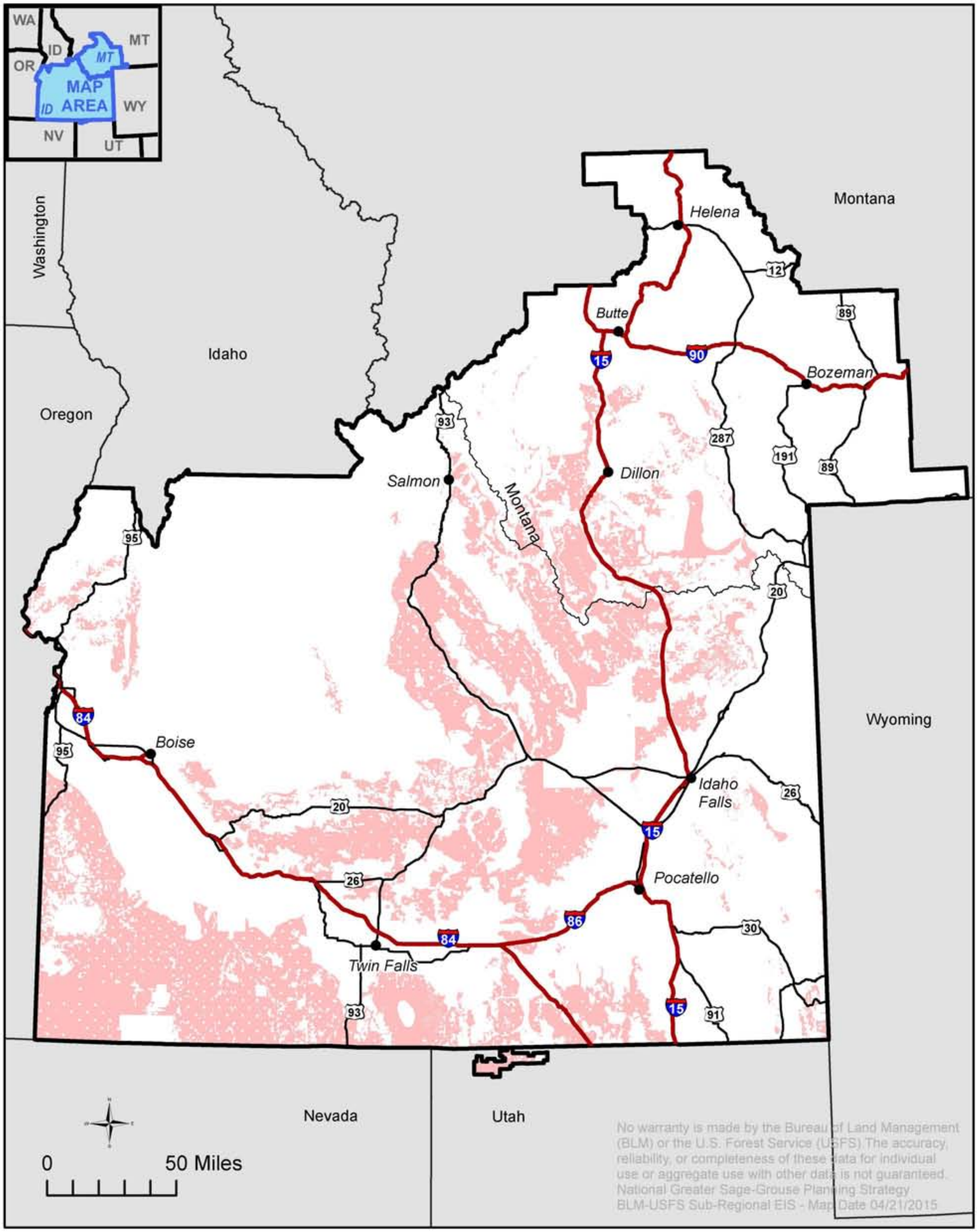
Availability to Grazing

Available

Unavailable

Idaho and SW Montana Sub-regional boundary

Figure 2-25
Alternative C: Available and Unavailable to Grazing



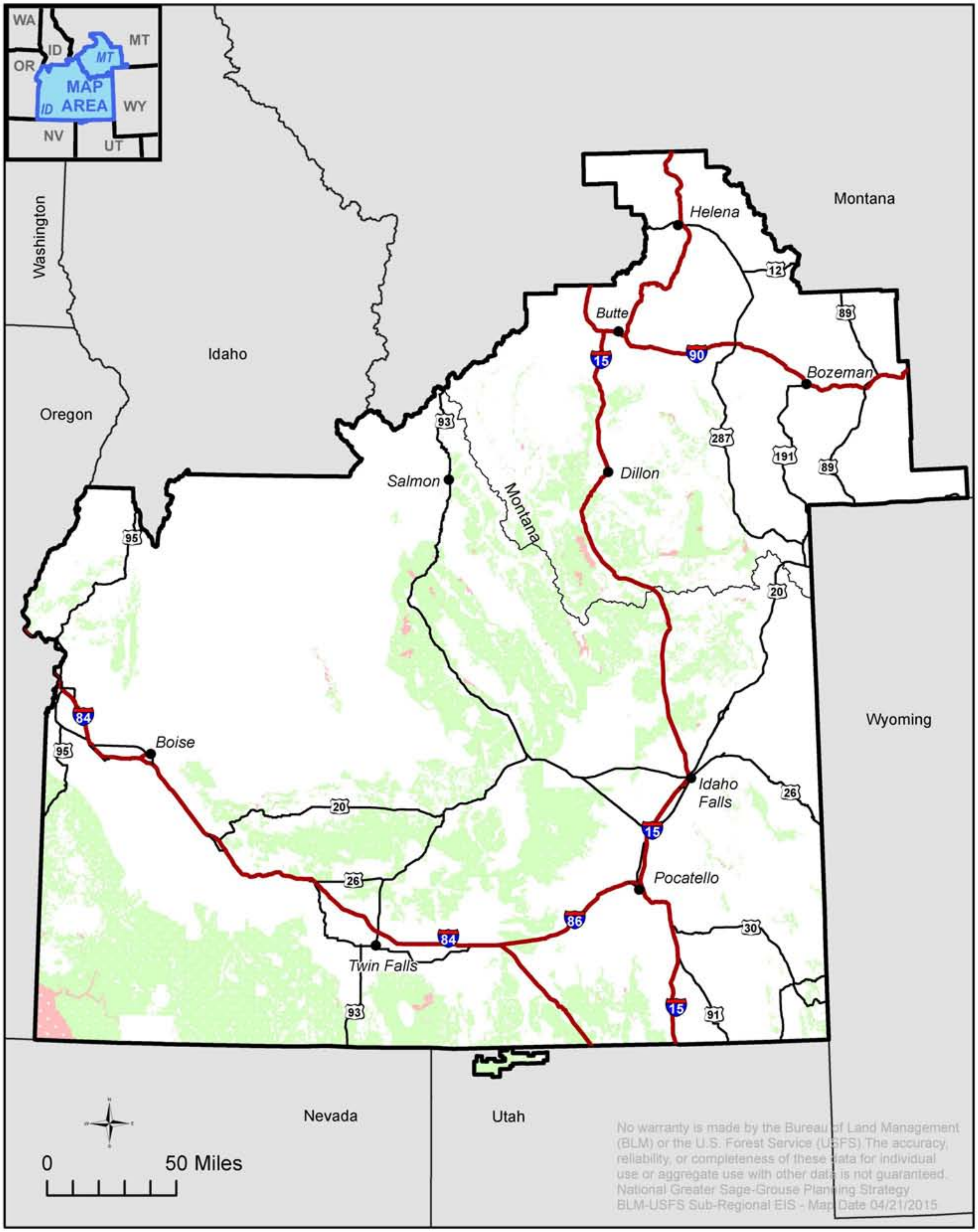
Availability to Grazing

Unavailable *

Idaho and SW Montana Sub-regional boundary

* All Habitat Unavailable to Grazing

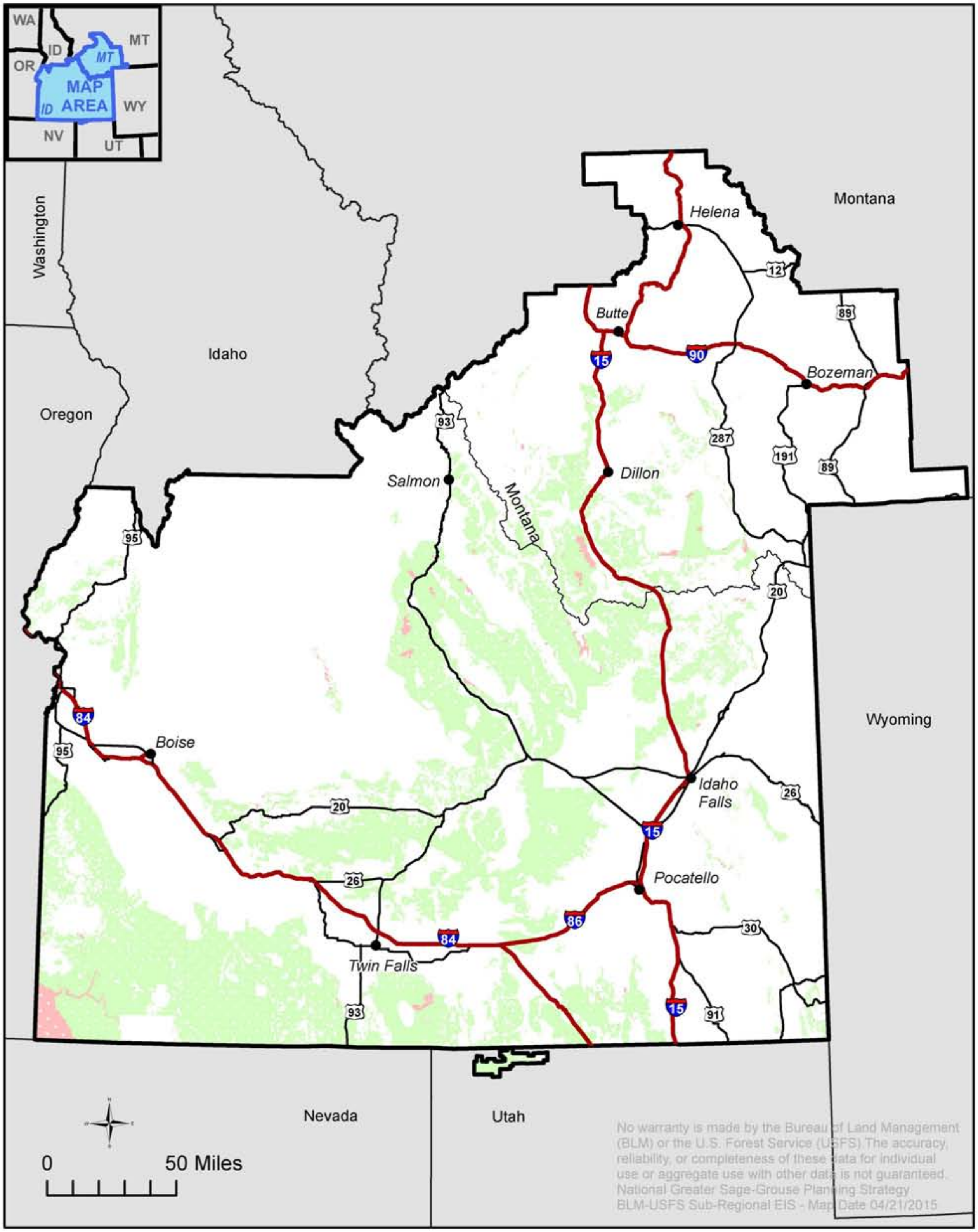
Figure 2-26
Alternative D: Available and Unavailable to Grazing



Availability to Grazing

- Available
- Unavailable
- *Idaho and SW Montana Sub-regional boundary*

Figure 2-27
Alternative E: Available and Unavailable to Grazing



Availability to Grazing

Available

Unavailable

Idaho and SW Montana Sub-regional boundary

Figure 2-28
Alternative F: Available and Unavailable to Grazing

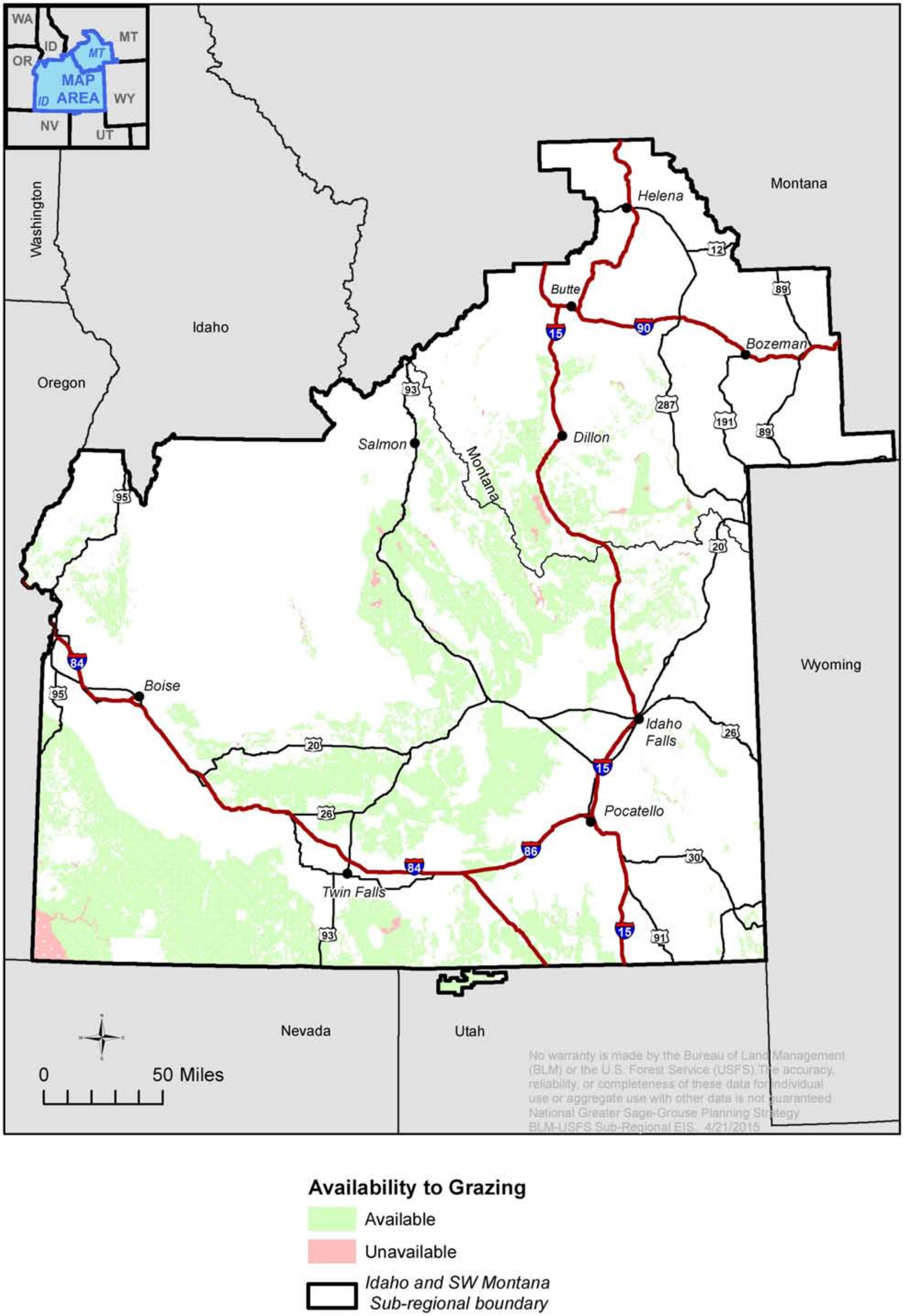
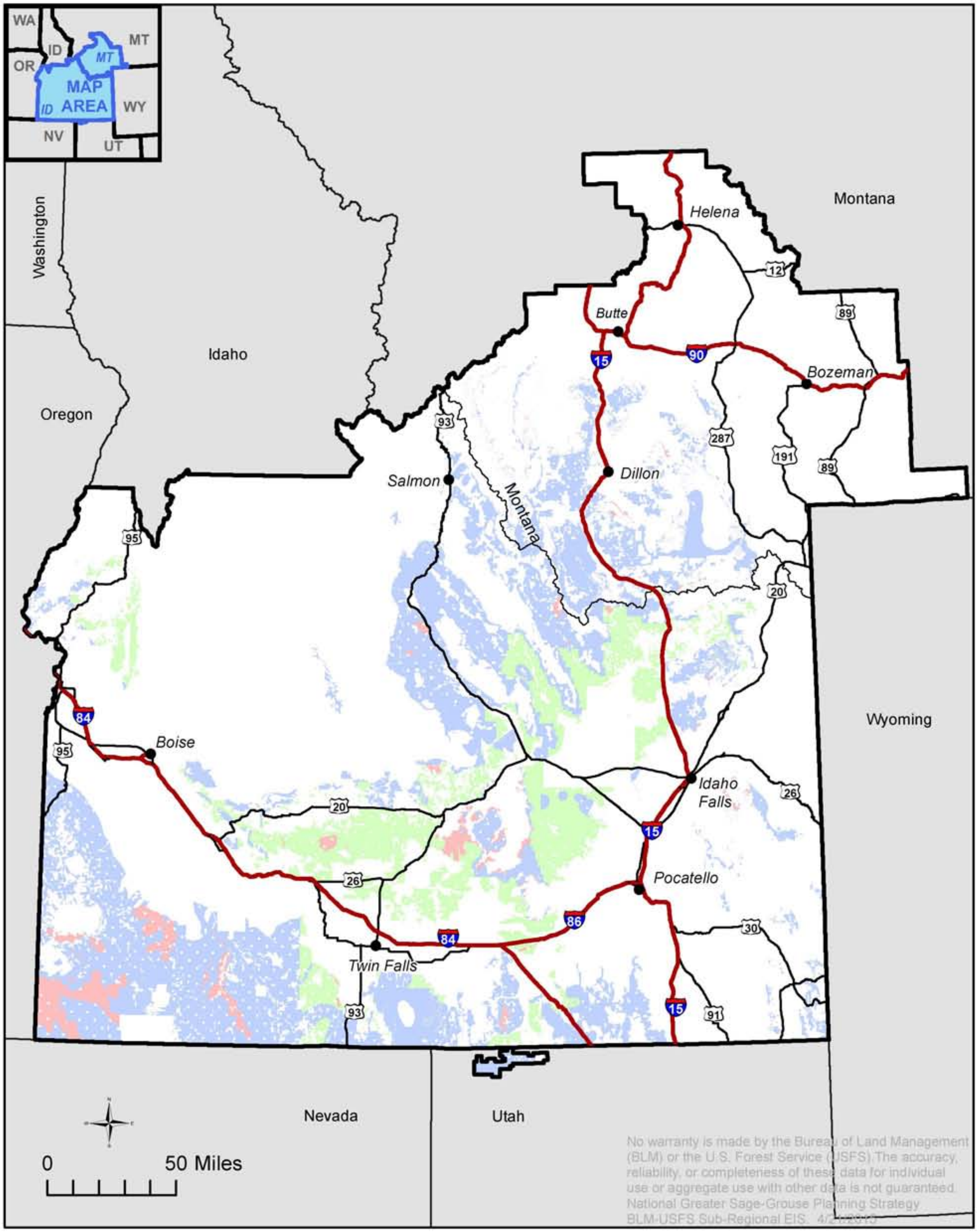


Figure 2-29
Alternative A: Travel Management Allocations

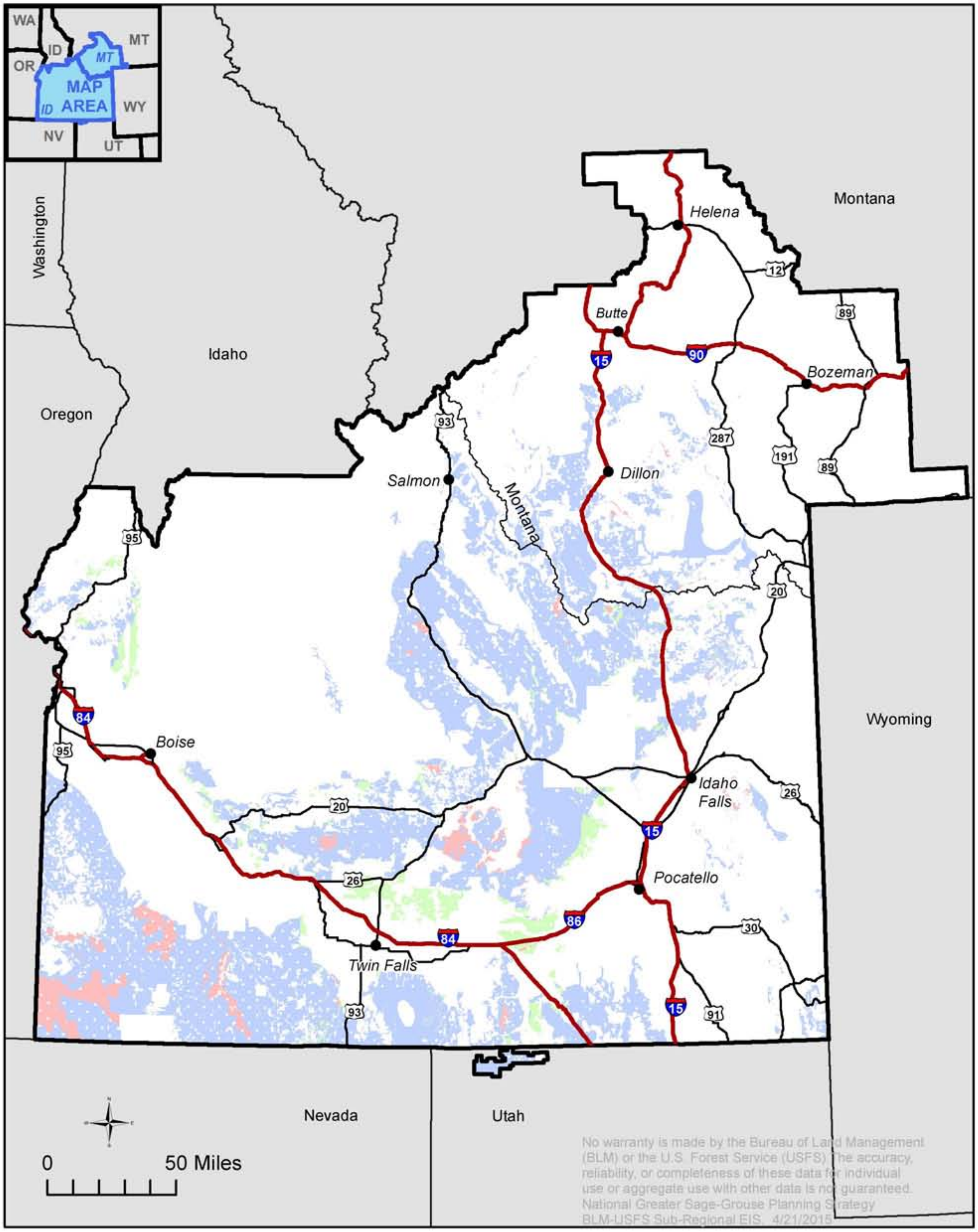


Travel Management Designation

- CLOSED
- LIMITED
- OPEN

Idaho and SW Montana Sub-regional boundary

Figure 2-30
Alternative B: Travel Management Allocations

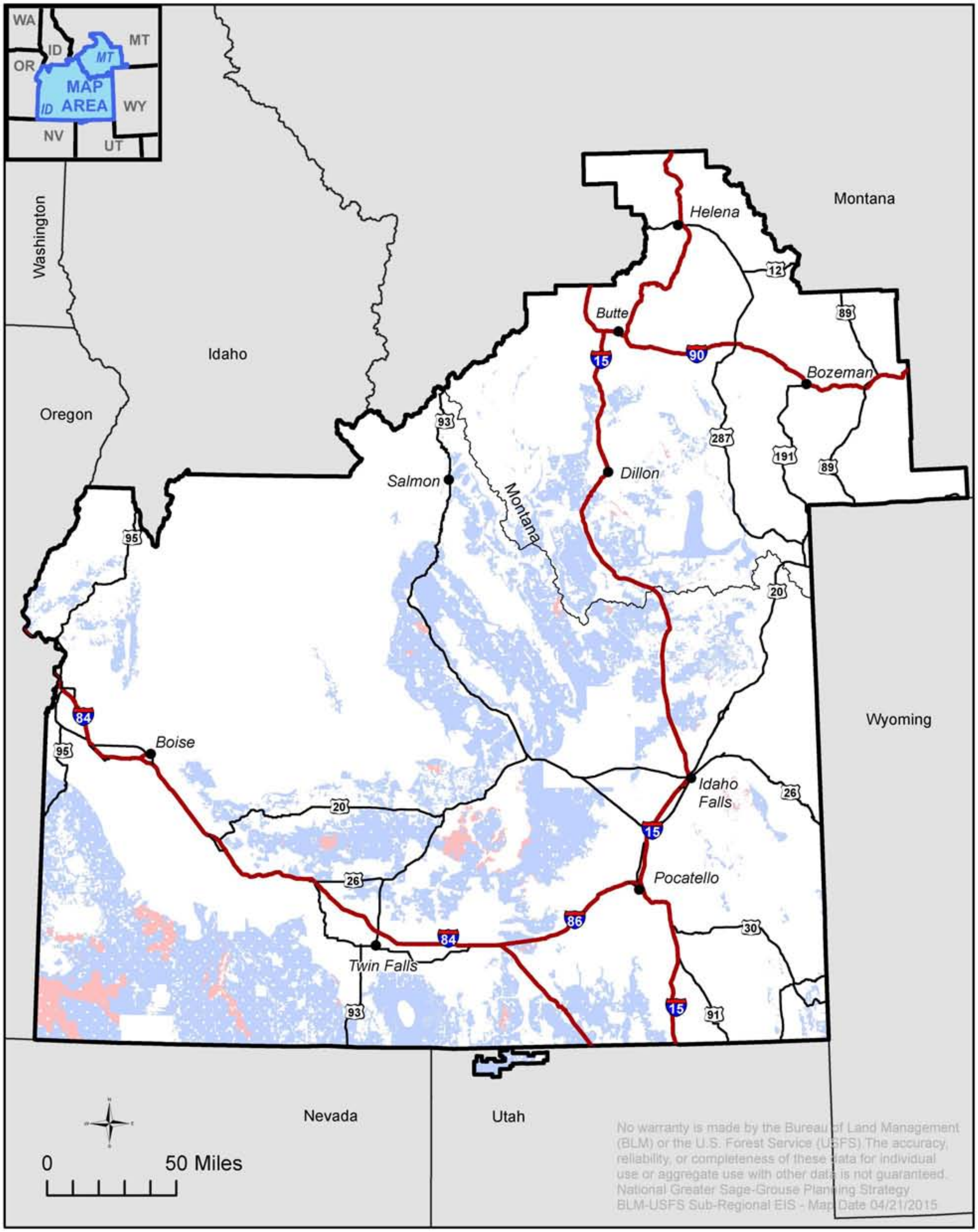


Travel Management Designation

- CLOSED
- LIMITED
- OPEN

Idaho and SW Montana Sub-regional boundary

Figure 2-31
Alternative C: Travel Management Allocations



Travel Management Designation

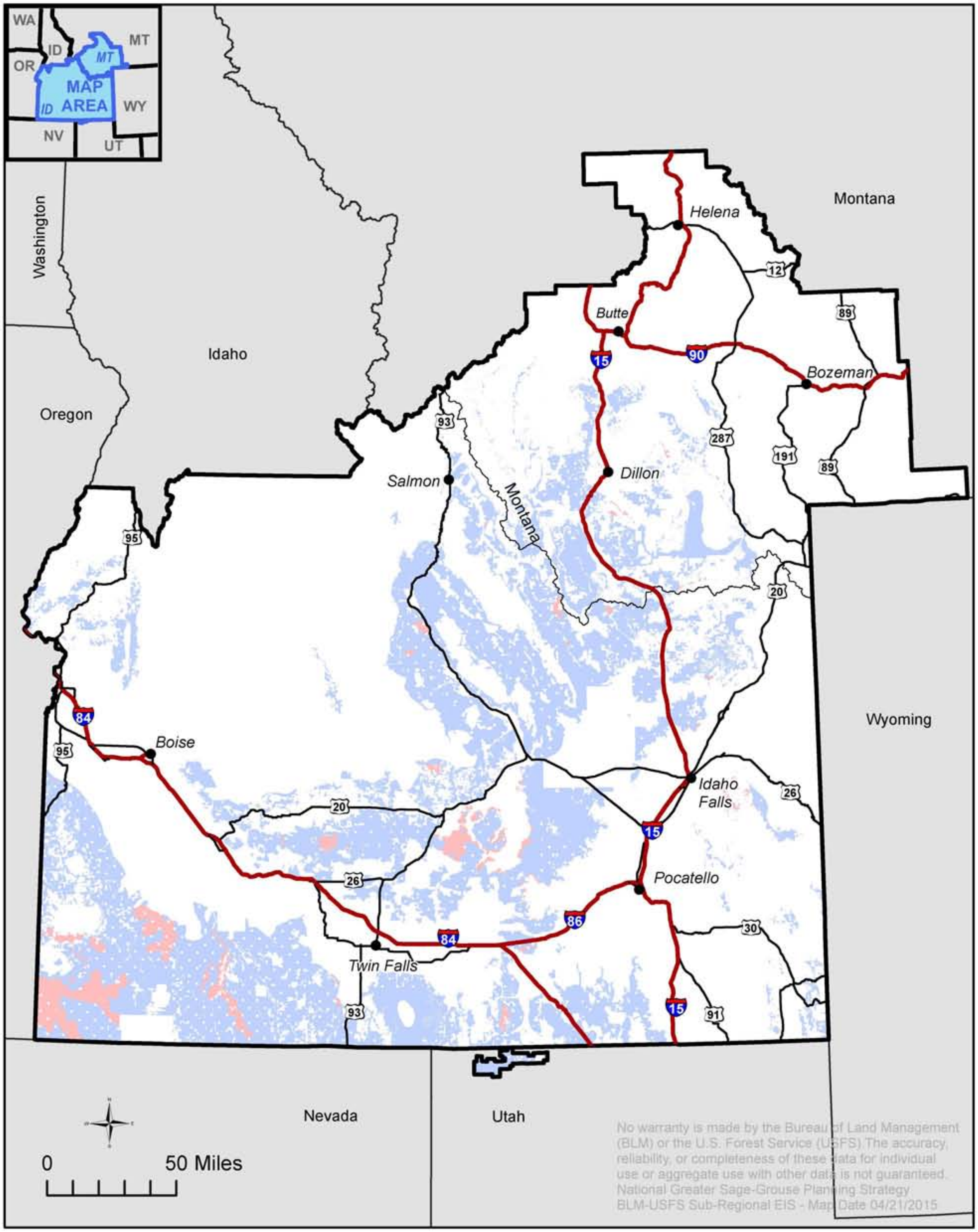
CLOSED

LIMITED

No Areas Open to cross-country travel in Habitat

Idaho and SW Montana Sub-regional boundary

Figure 2-32
Alternative D: Travel Management Allocations

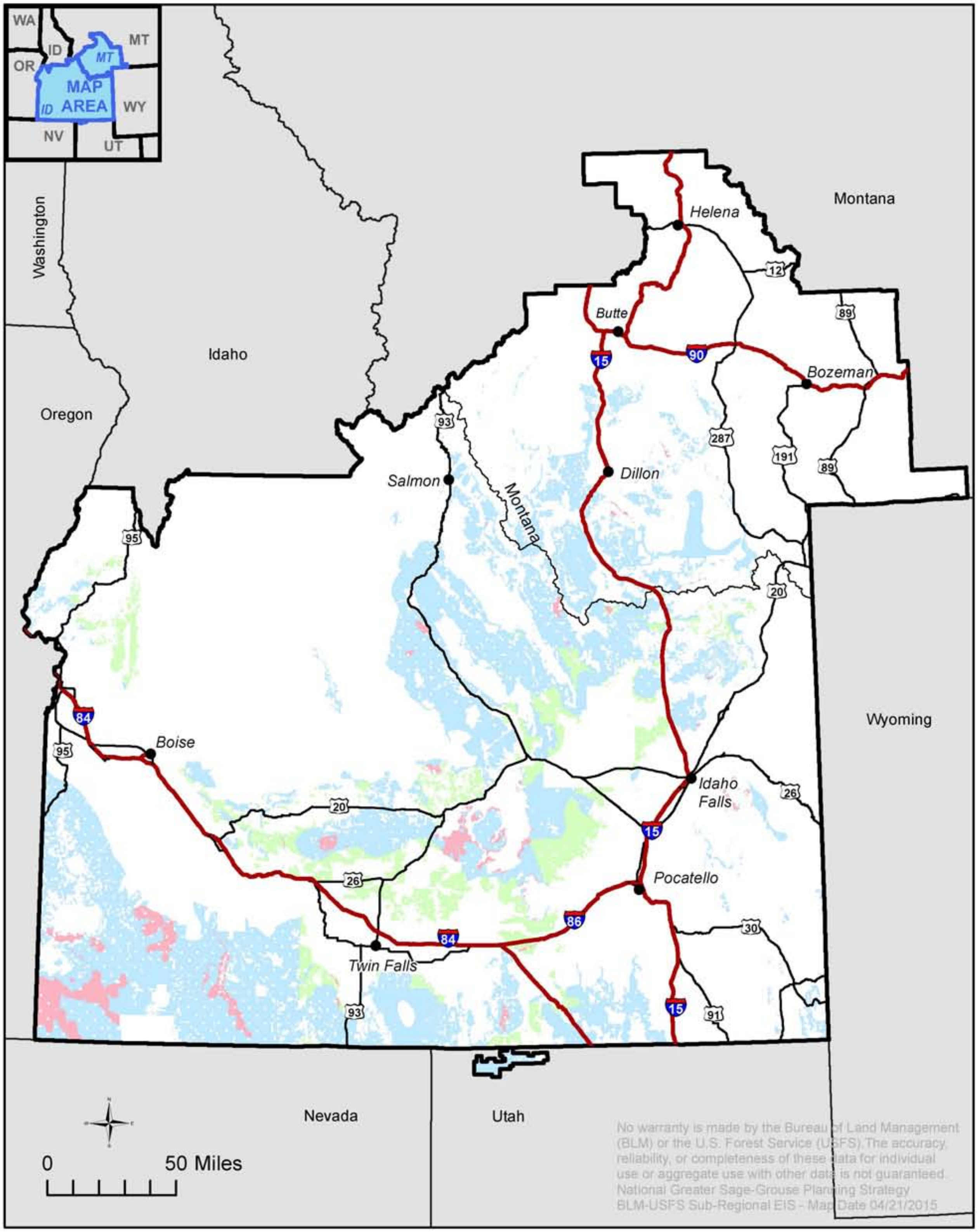


Travel Management Designation

- CLOSED
- LIMITED
- OPEN

Idaho and SW Montana Sub-regional boundary

Figure 2-33
Alternative E: Travel Management Allocations



Travel Management Designation

- CLOSED
- LIMITED
- OPEN

Idaho and SW Montana Sub-regional boundary

Figure 2-34
Alternative F: Travel Management Allocations

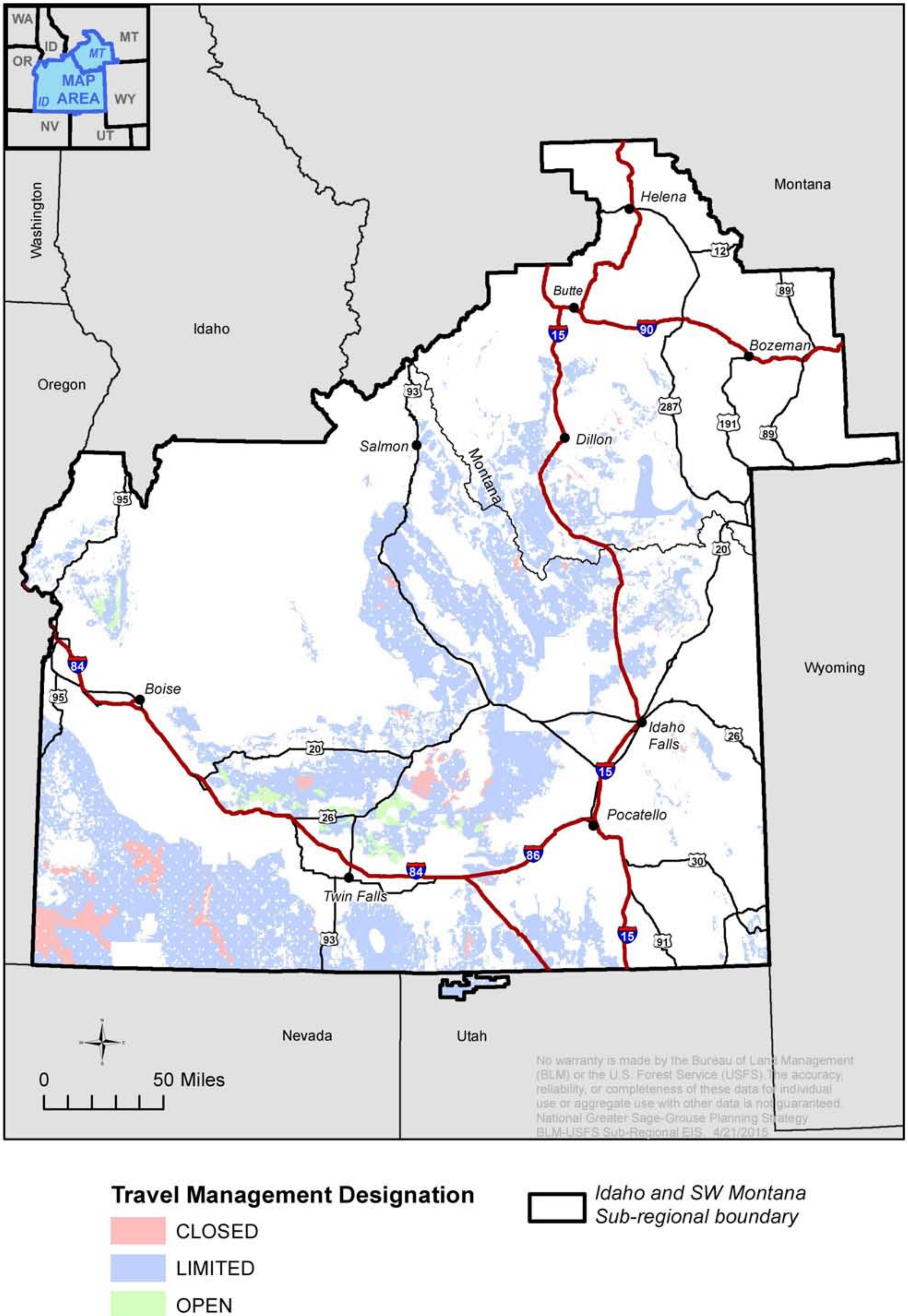
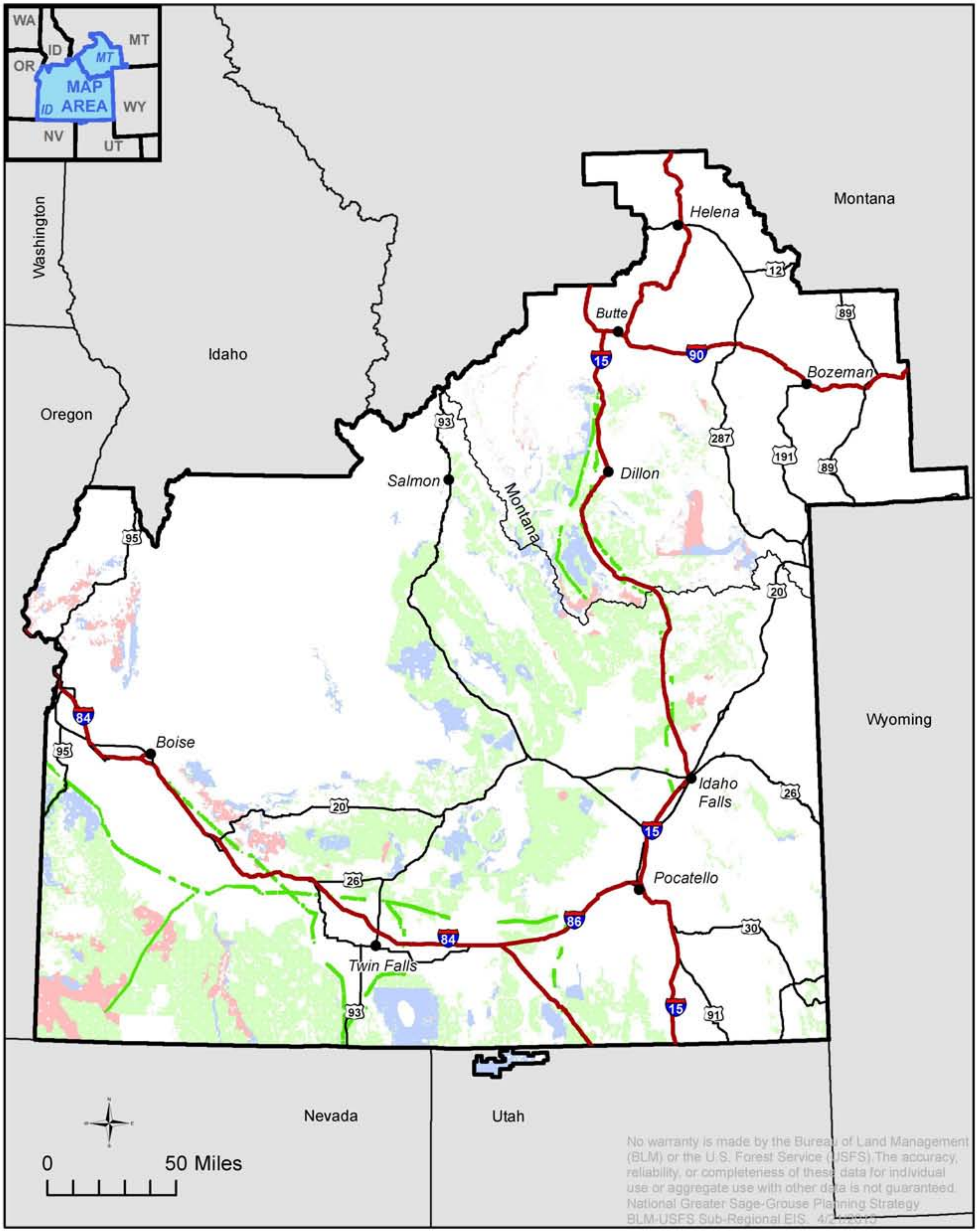


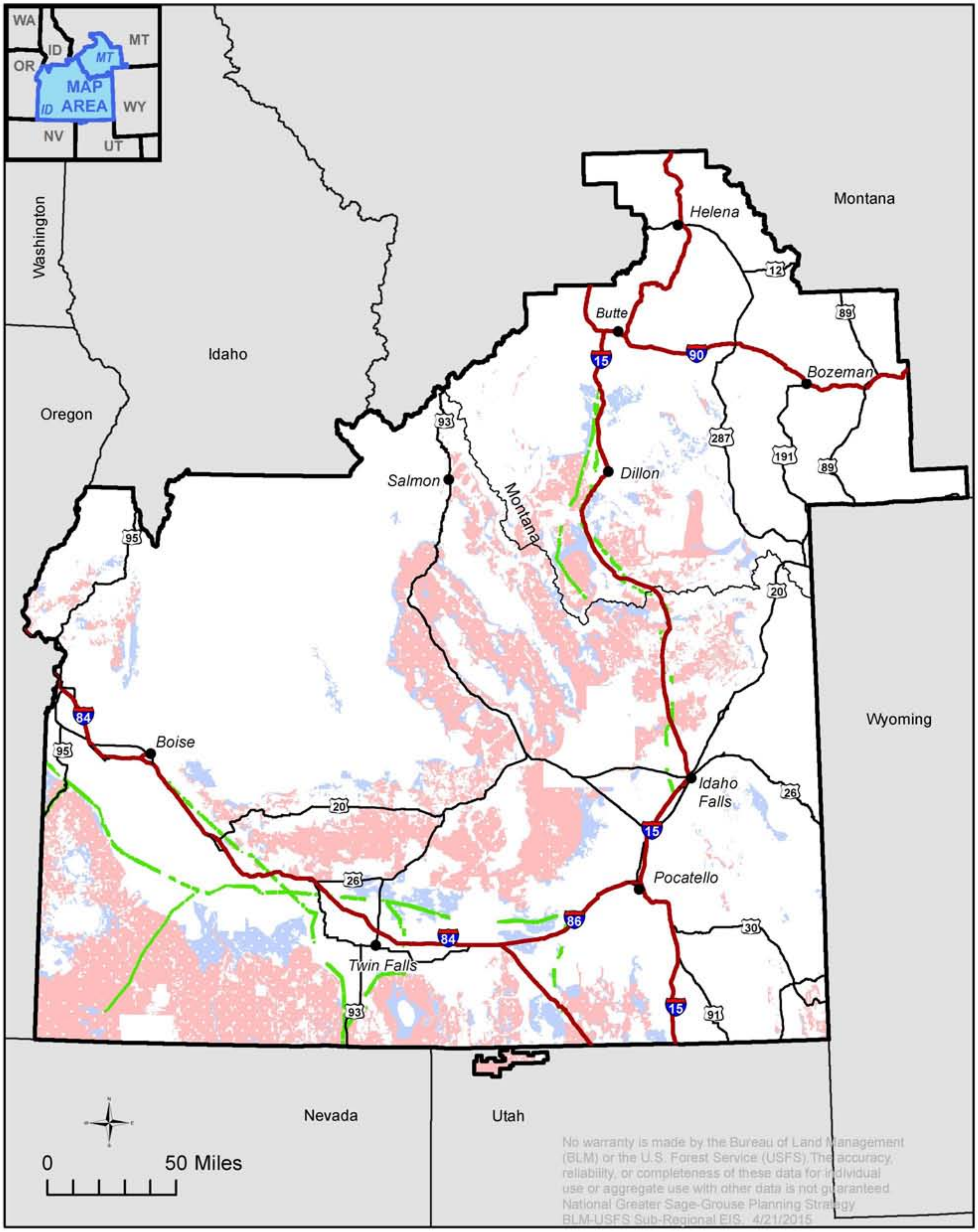
Figure 2-35
Alternative A: Right-of-Way Development Allocations



Constraint

- Exclusion
- Avoidance
- Open
- Existing Utility Corridor
- *Idaho and SW Montana Sub-regional boundary*

Figure 2-36
Alternative B: Right-of-Way Development Allocations



Constraint
- Exclusion
- Avoidance
- Open
- Existing Utility Corridor
- *Idaho and SW Montana Sub-regional boundary*

Figure 2-37
Alternative C: Right-of-Way Development Allocations

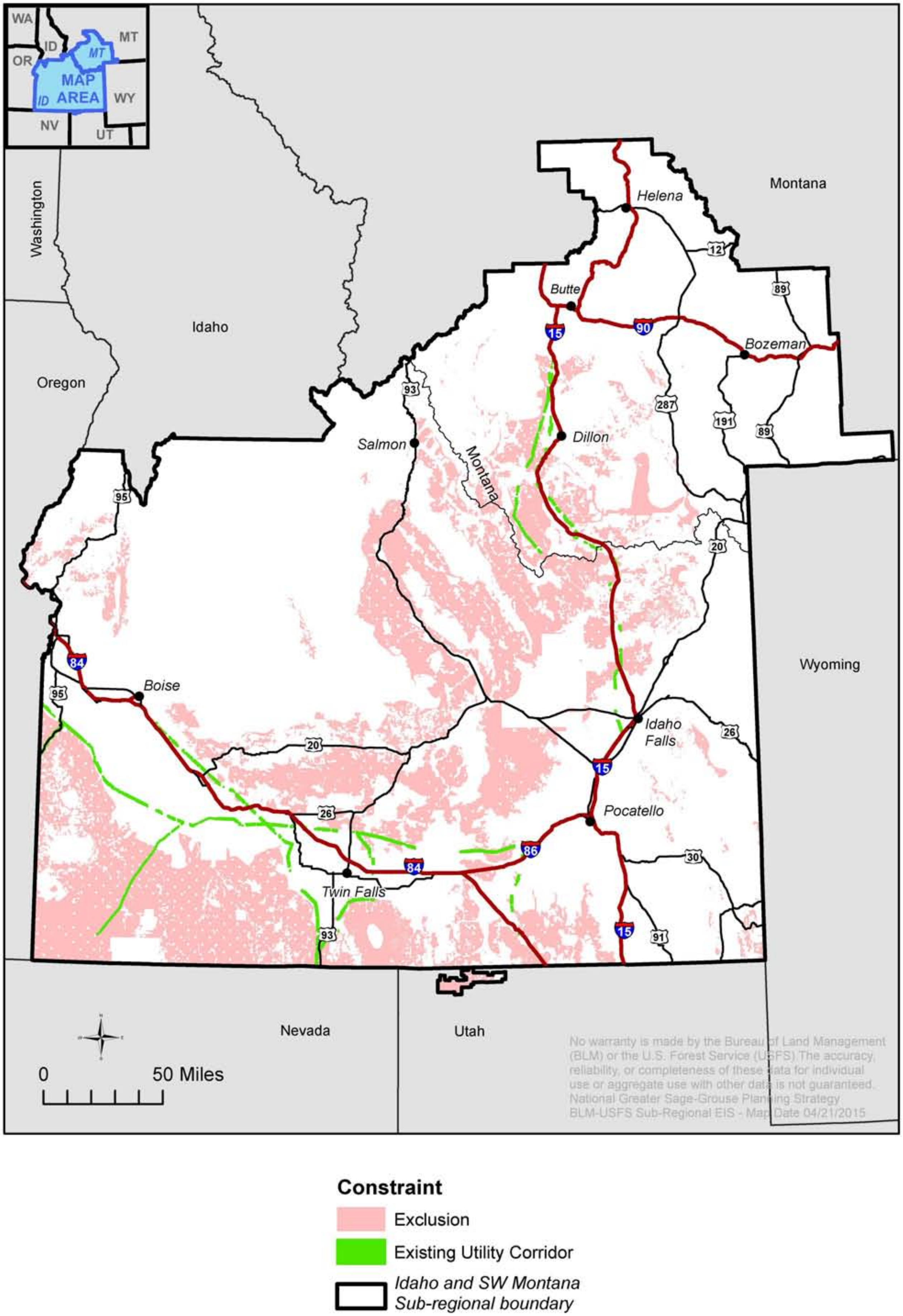
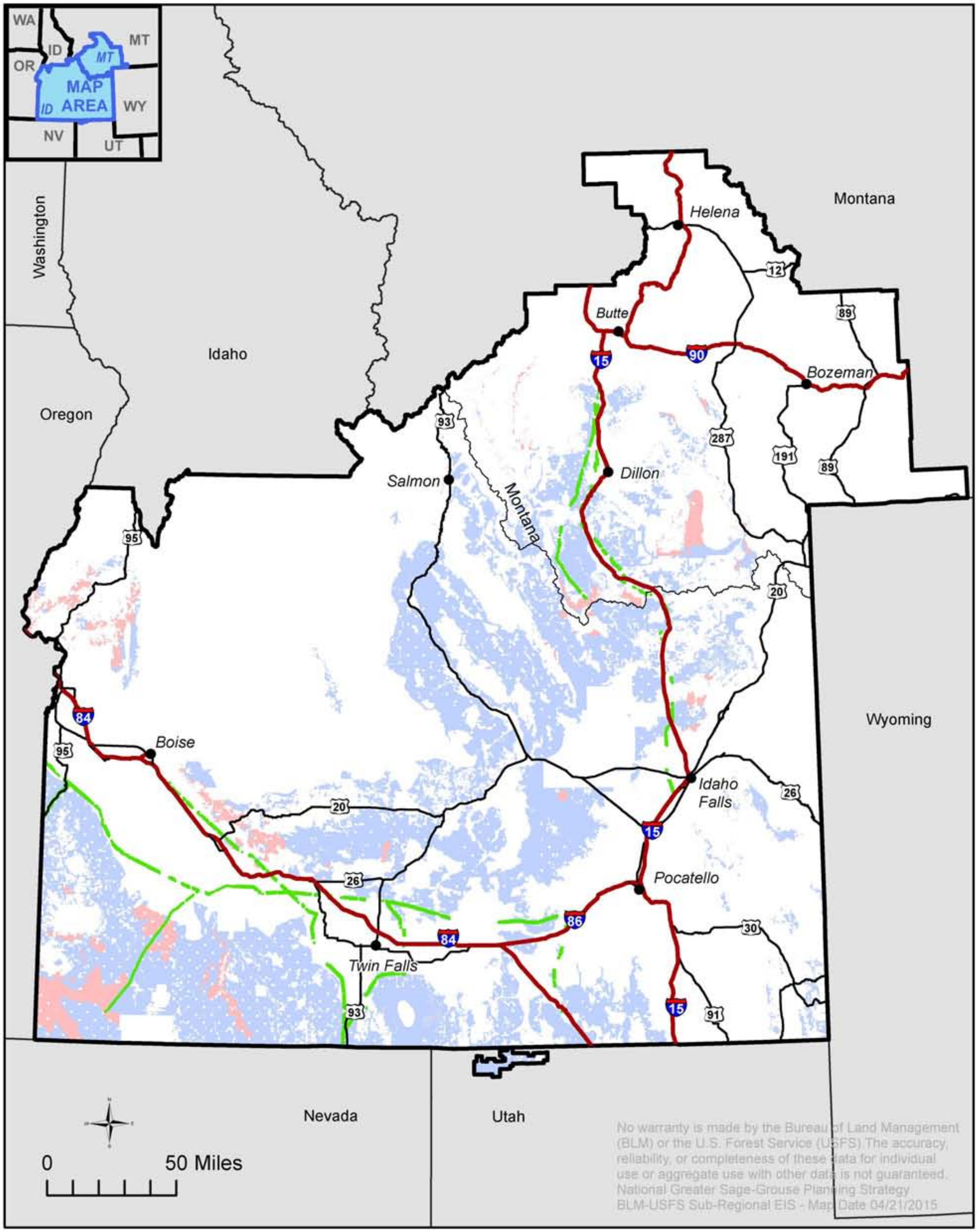


Figure 2-38
Alternative D: Right-of-Way Development Allocations



Constraint

- Exclusion
- Avoidance
- Open
- Existing Utility Corridor
- *Idaho and SW Montana Sub-regional boundary*

Figure 2-39
Alternative E: Right-of-Way Development Allocations

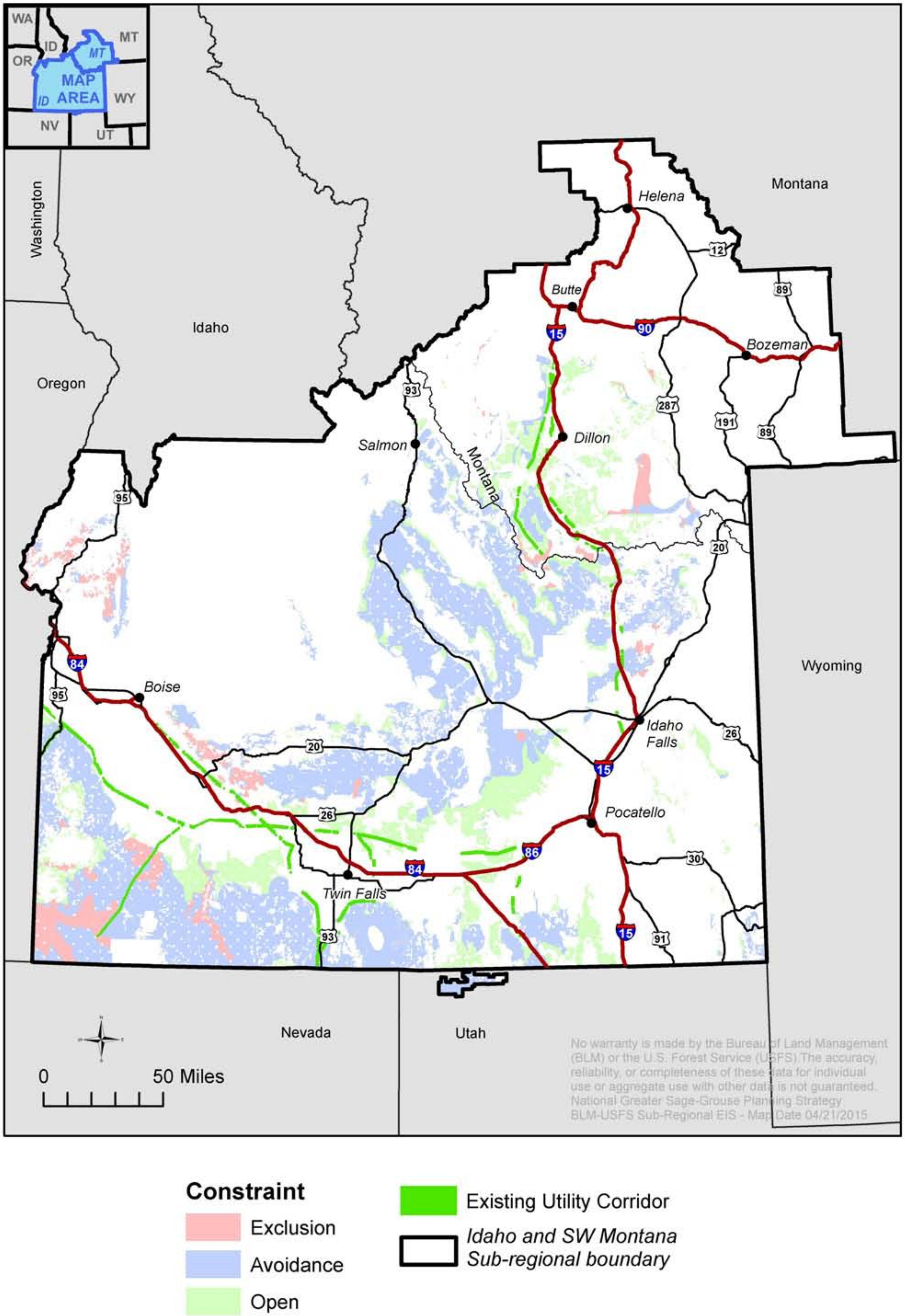


Figure 2-40
Alternative F: Right-of-Way Development Allocations

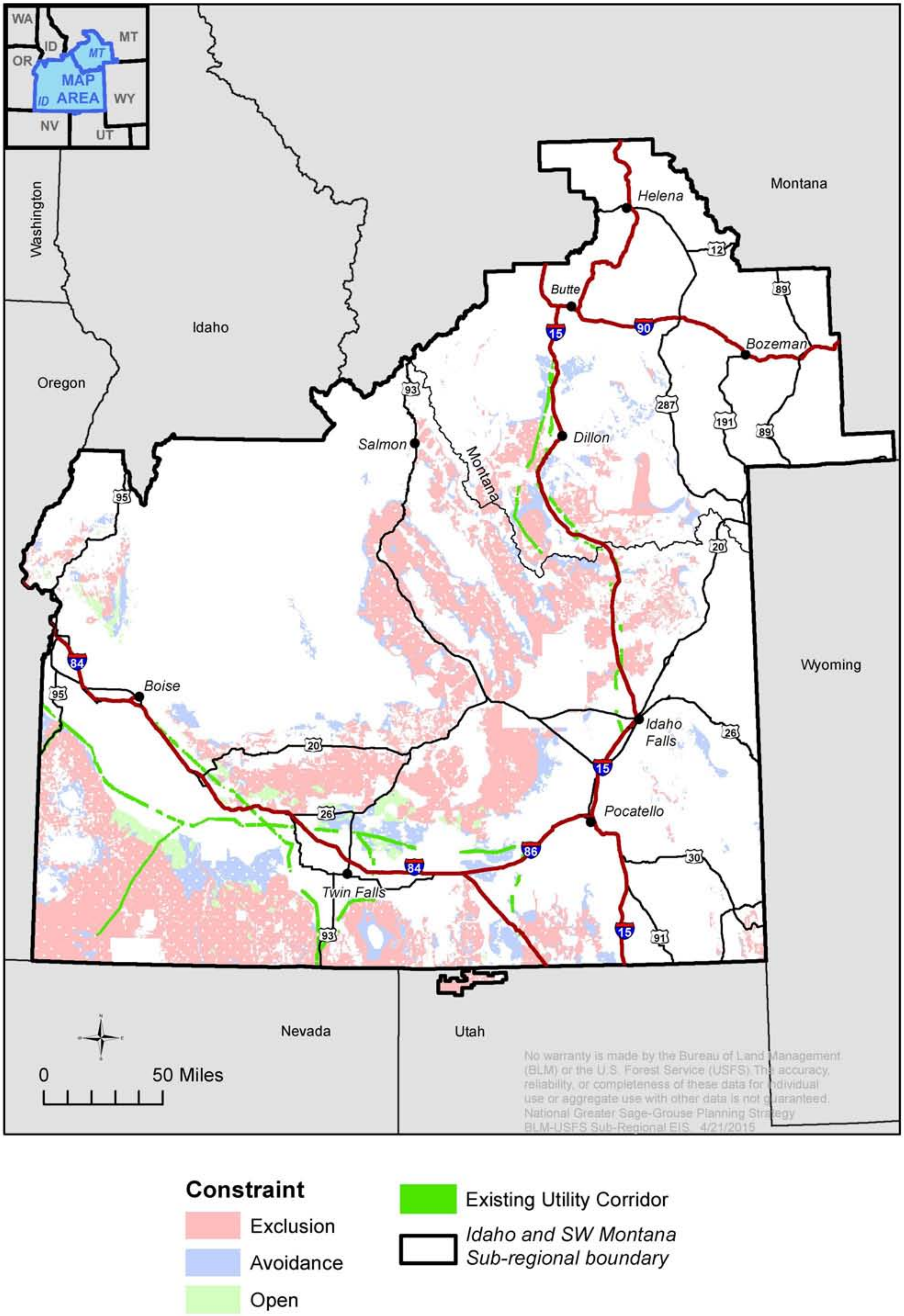


Figure 2-41
Alternative A: Wind and Solar Development Allocations

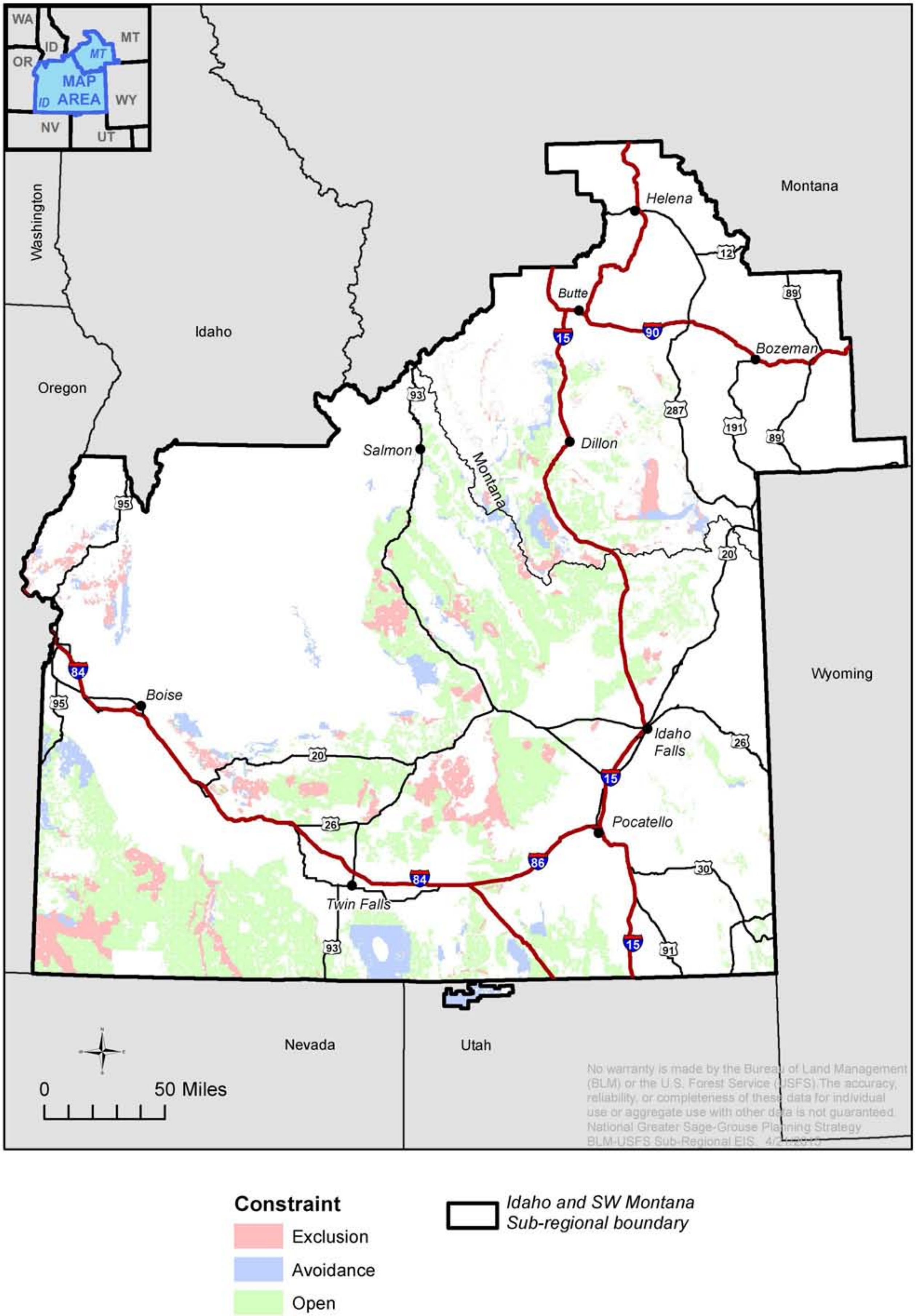
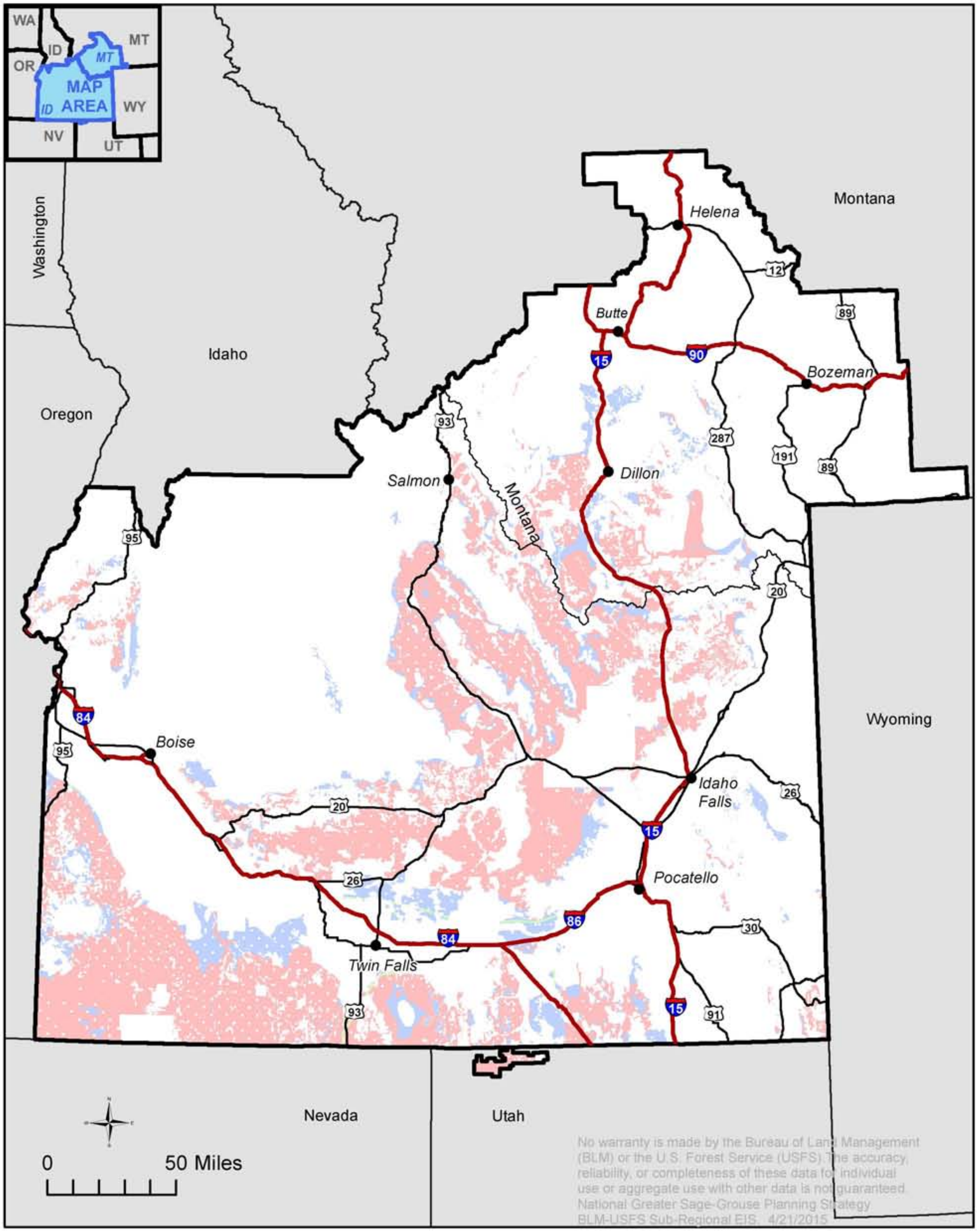


Figure 2-42
Alternative B: Wind and Solar Development Allocations



Constraint

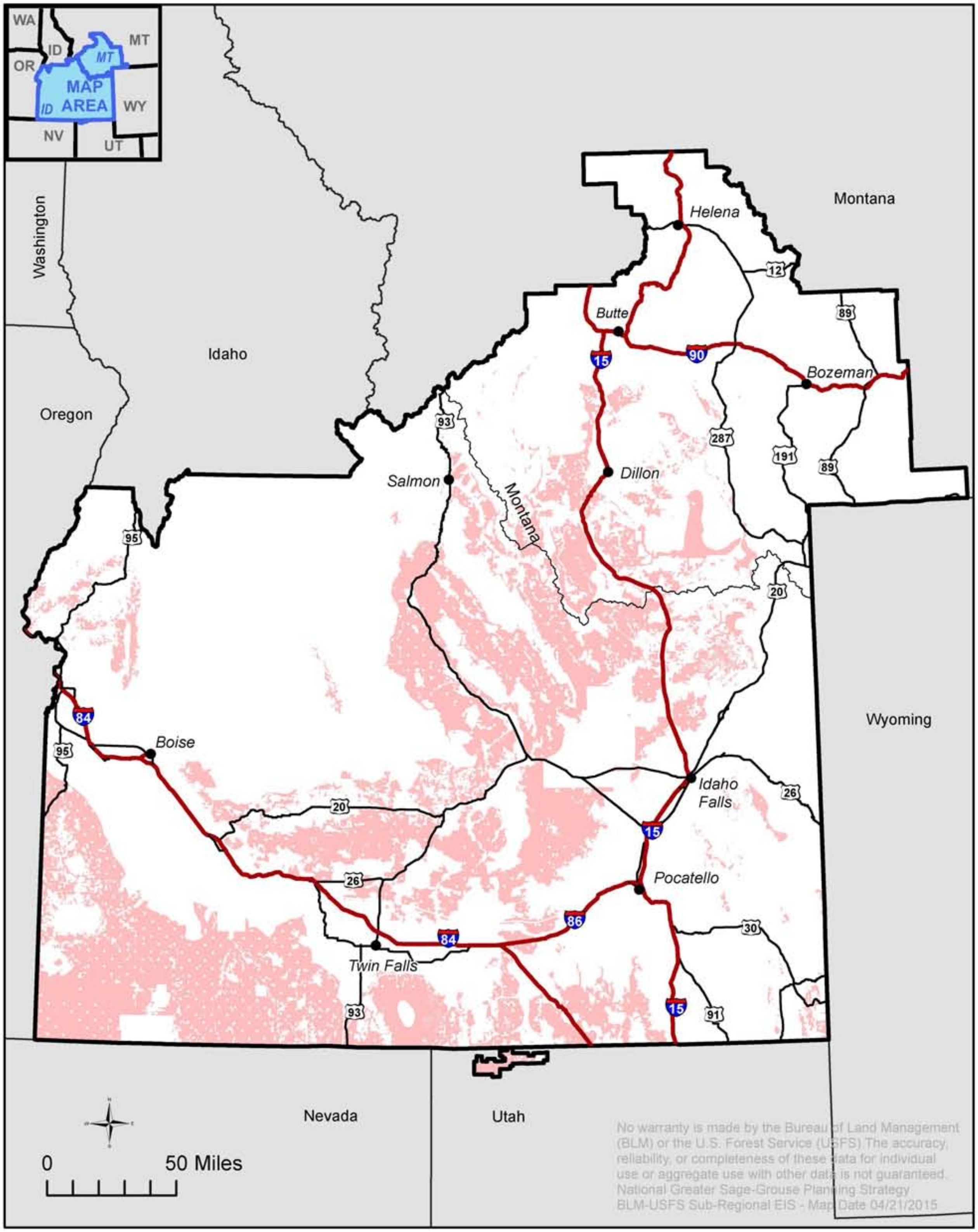
Exclusion

Avoidance

Open

Idaho and SW Montana Sub-regional boundary

Figure 2-43
Alternative C: Wind and Solar Development Allocations

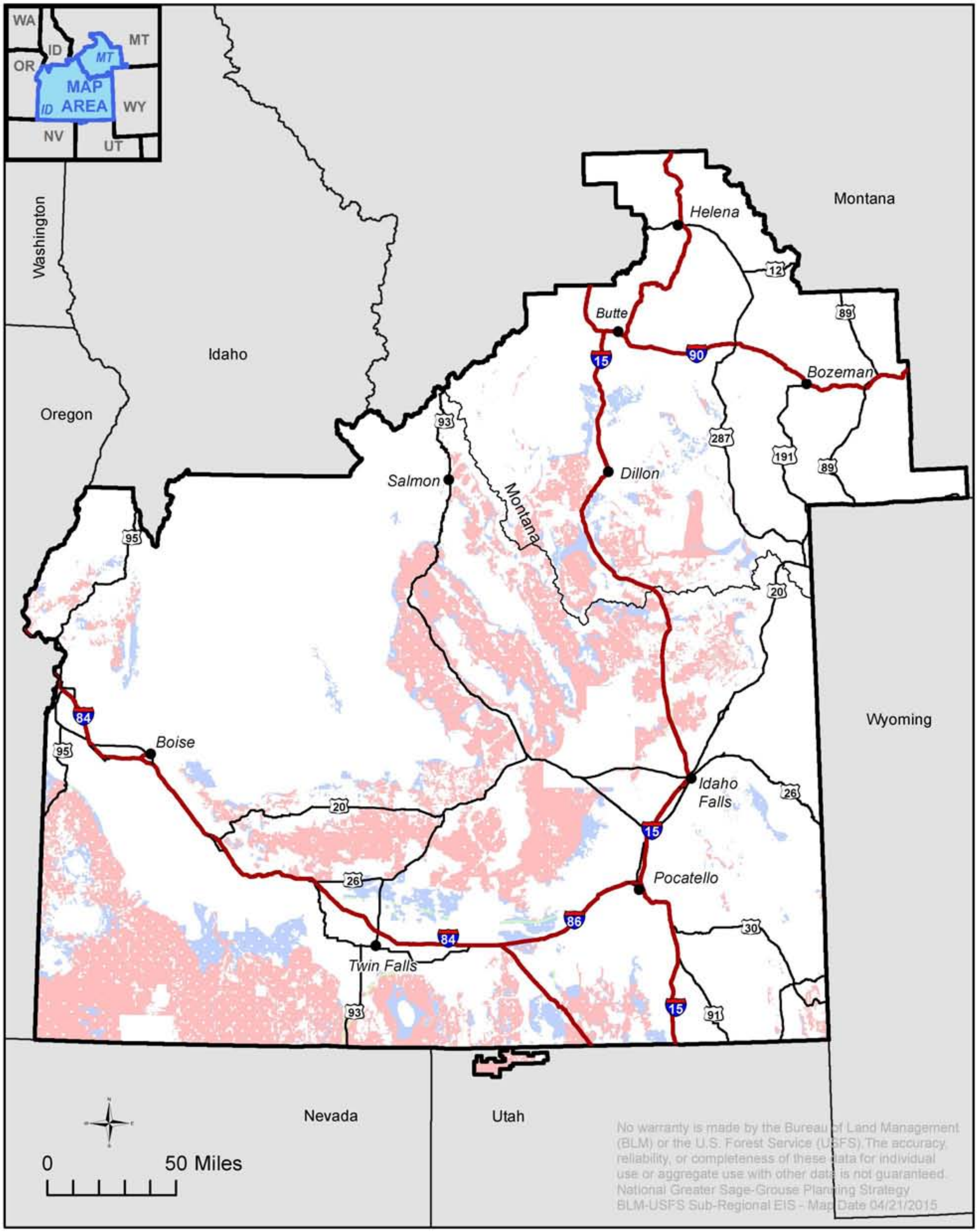


Constraint

Exclusion

Idaho and SW Montana Sub-regional boundary

Figure 2-44
Alternative D: Wind and Solar Development Allocations

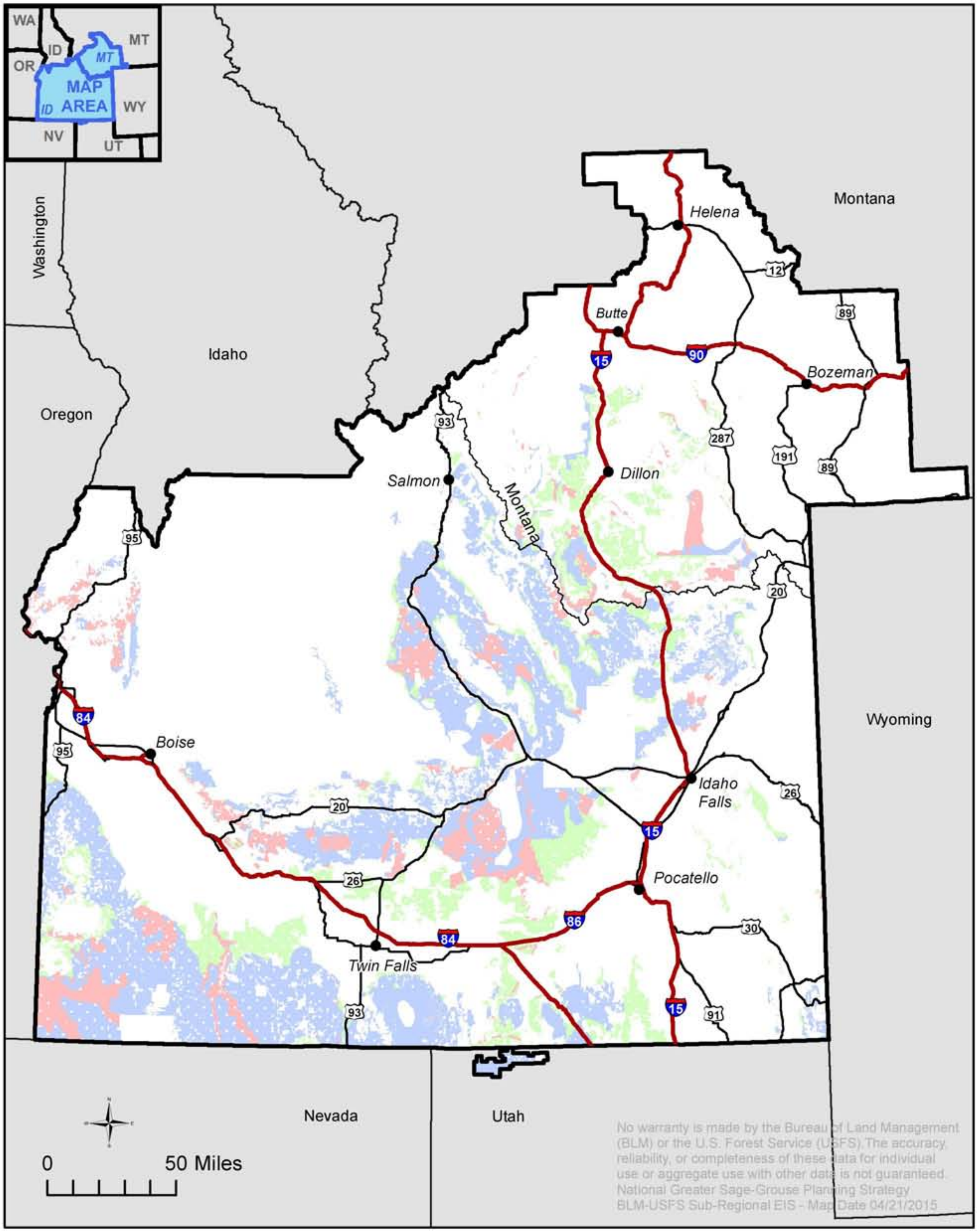


Constraint

- Exclusion
- Avoidance
- Open

Idaho and SW Montana Sub-regional boundary

Figure 2-45
Alternative E: Wind and Solar Development Allocations



Constraint

- Exclusion
- Avoidance
- Open

Idaho and SW Montana Sub-regional boundary

Figure 2-46
Alternative F: Wind and Solar Development Allocations

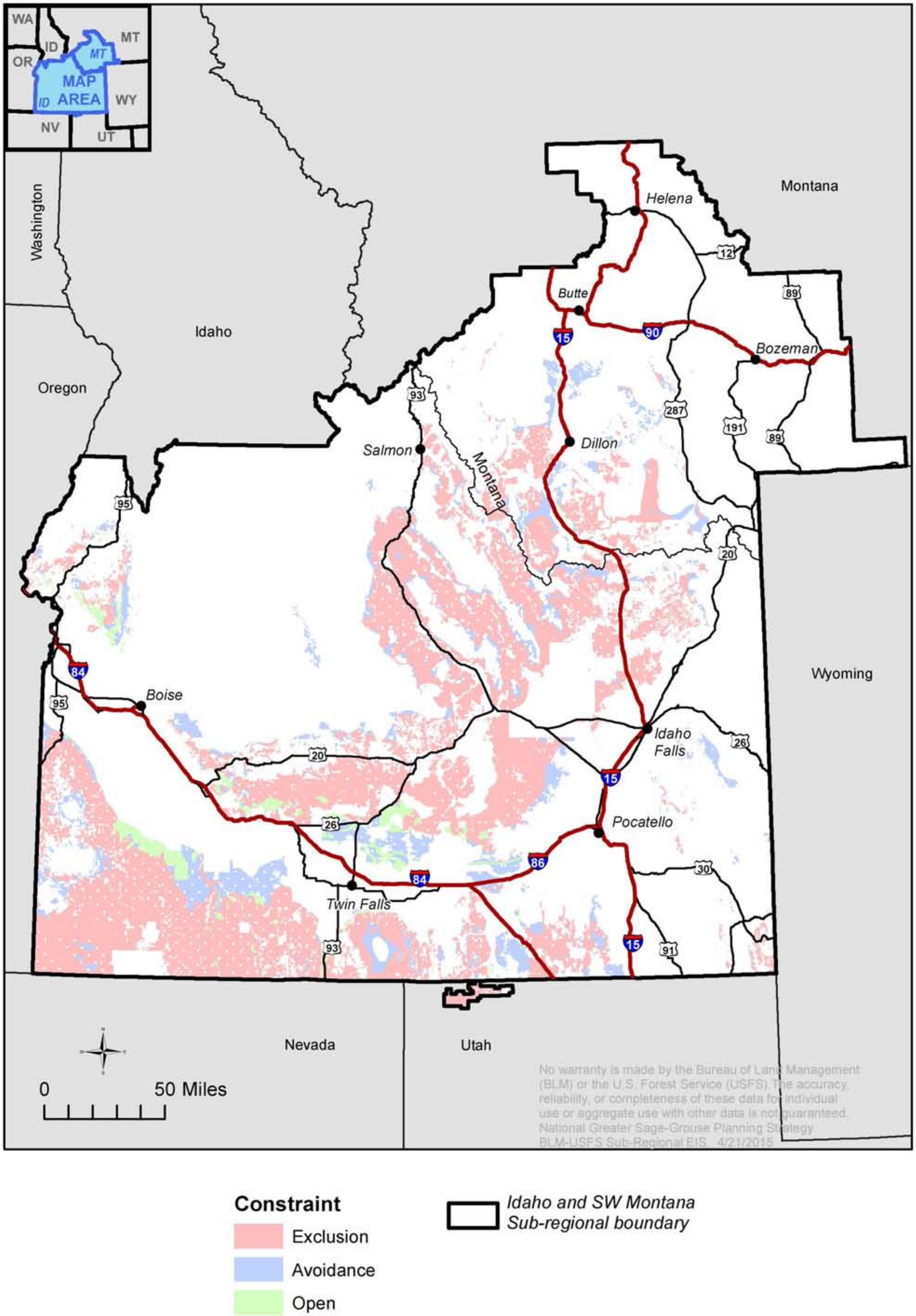


Figure 2-47
Alternative A: Existing Designated Utility Corridors

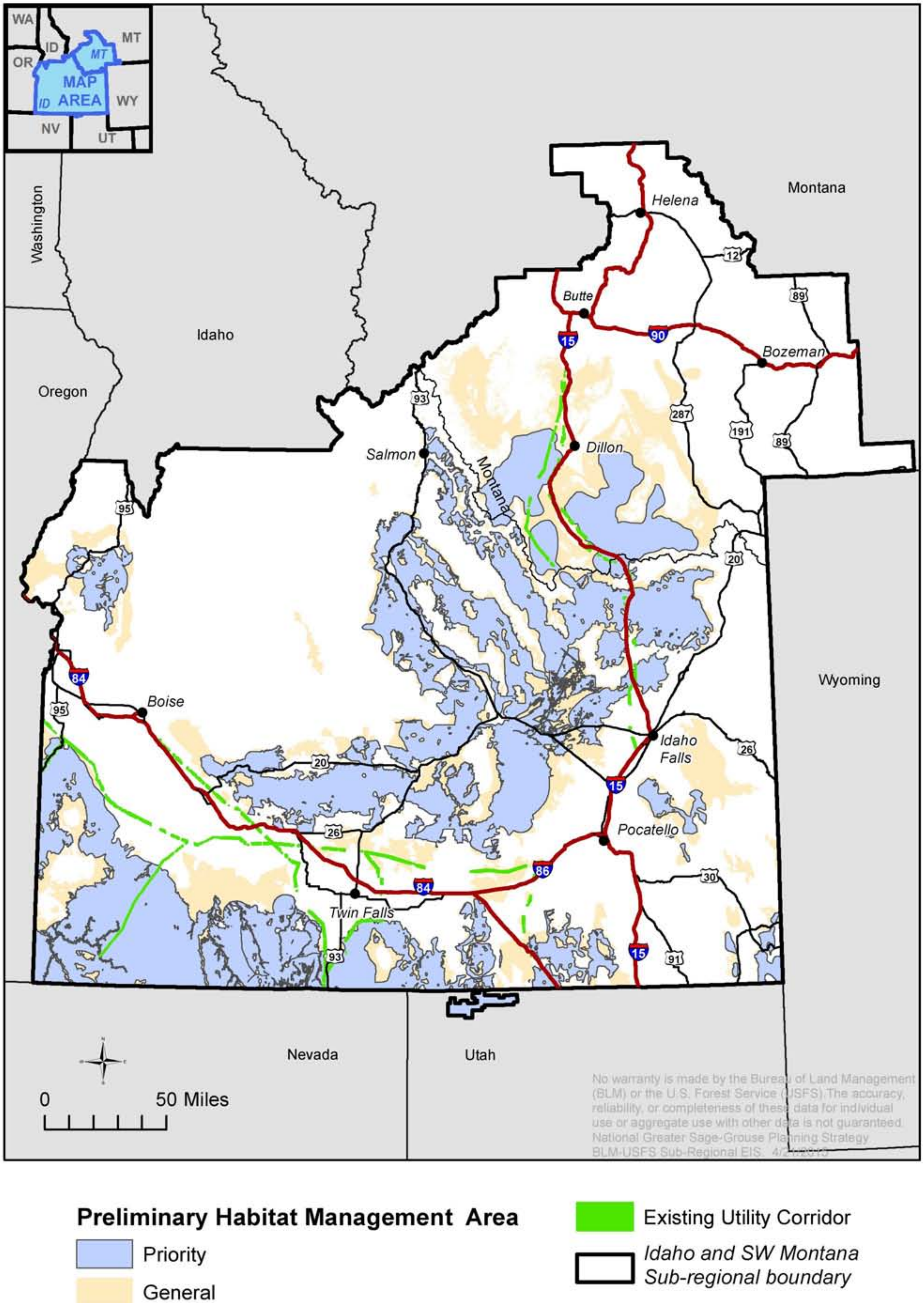


Figure 2-48
Alternative B: Existing Designated Utility Corridors

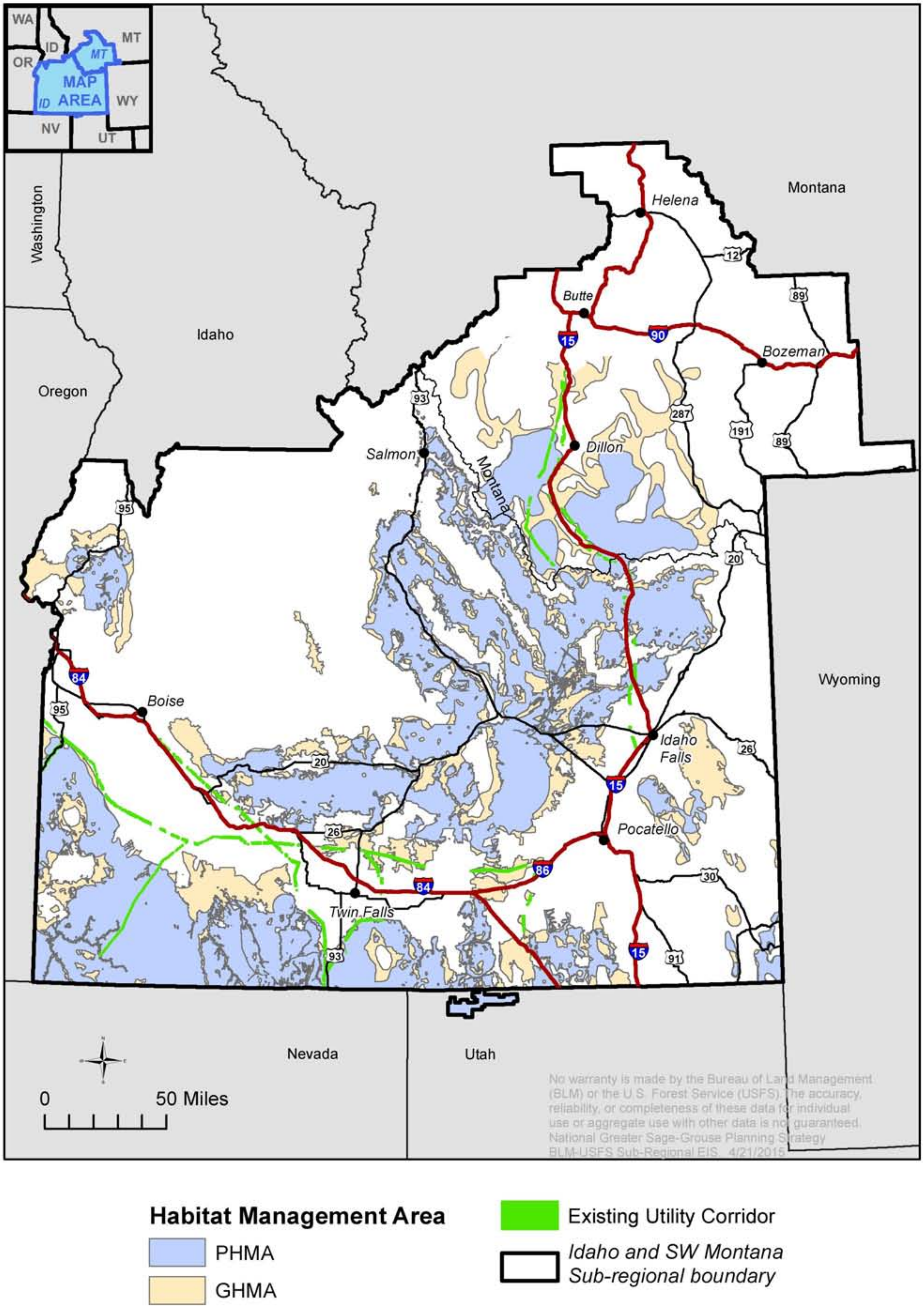


Figure 2-49
Alternative C: Existing Designated Utility Corridors

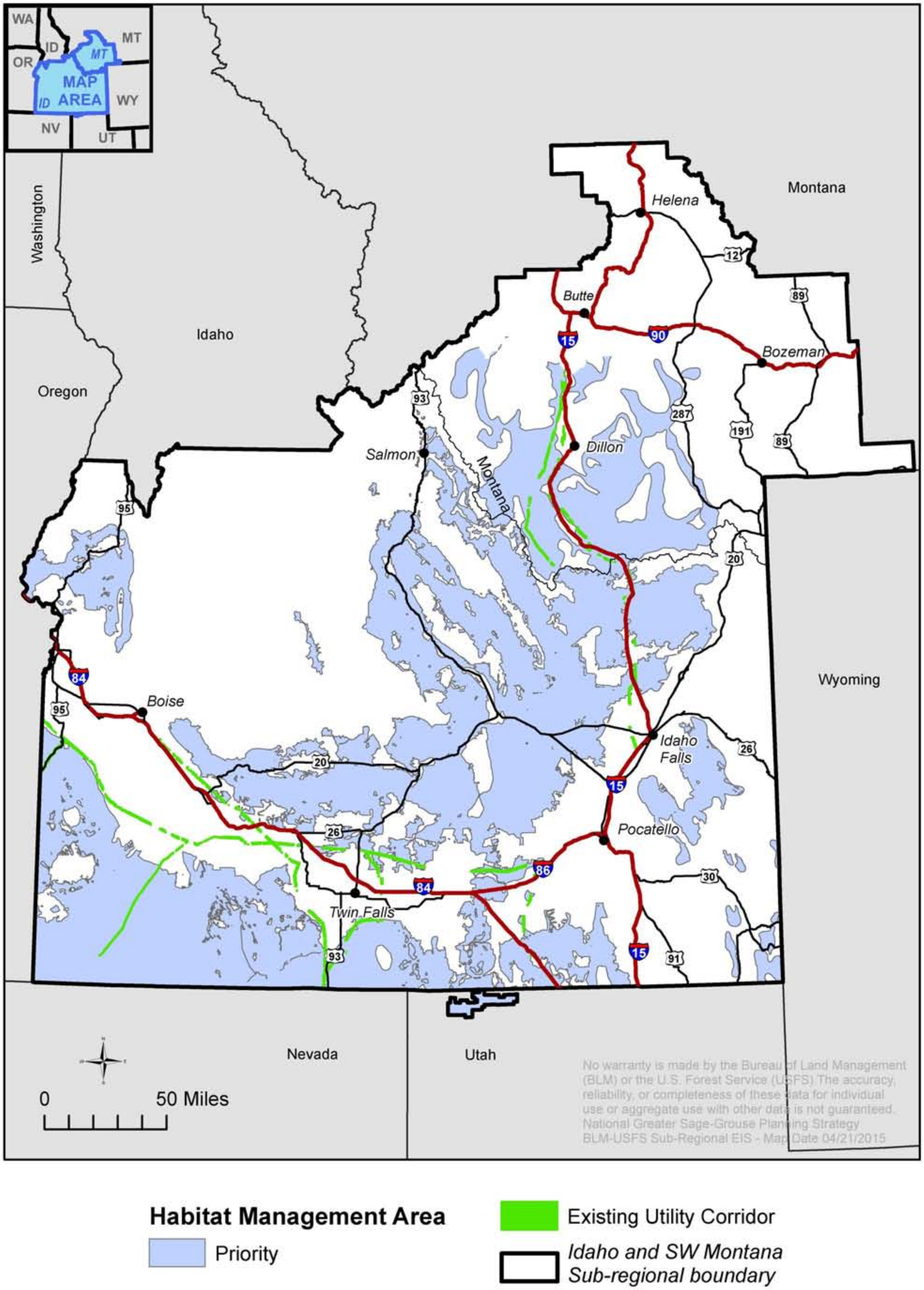
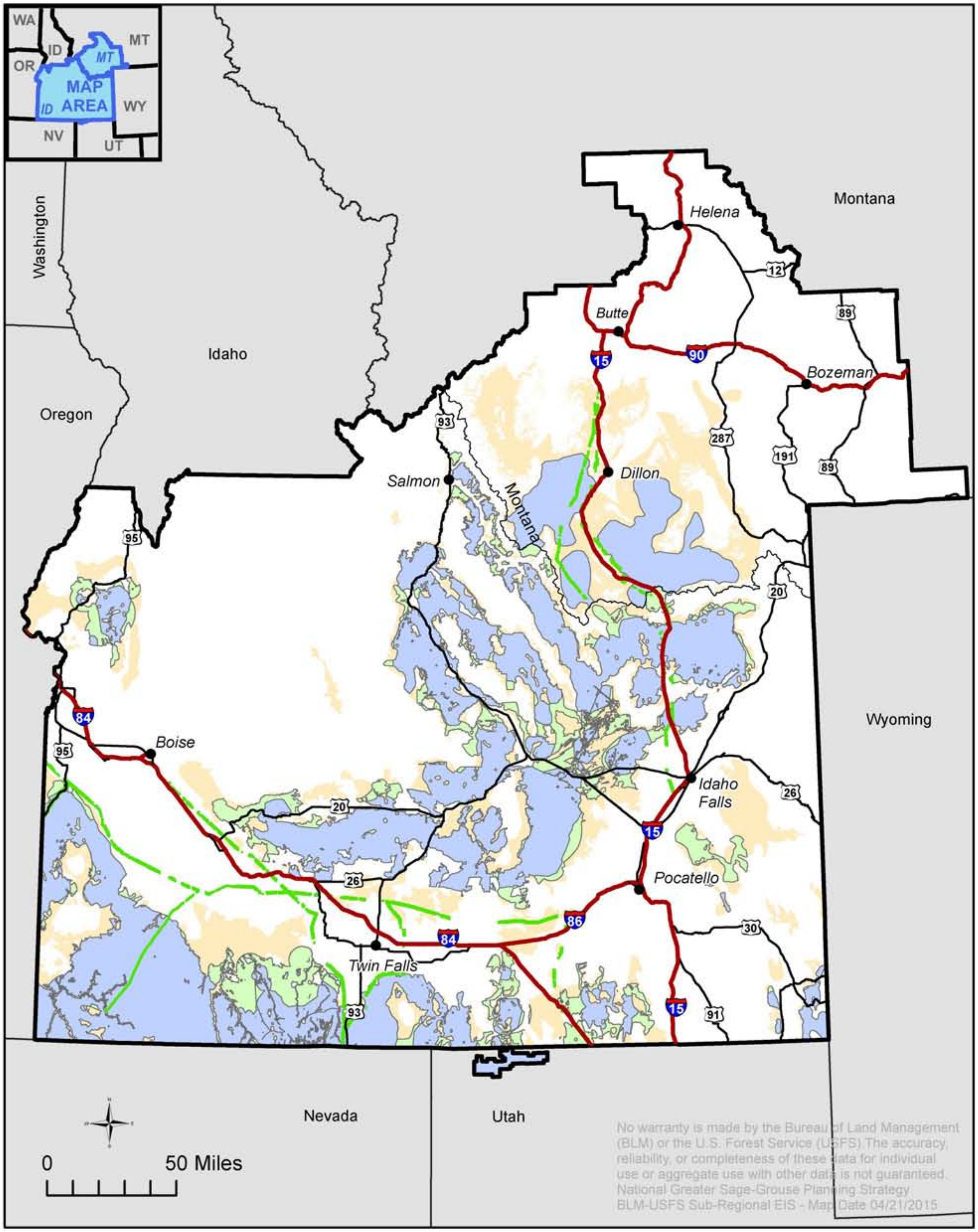


Figure 2-50
Alternative D: Existing Designated Utility Corridors



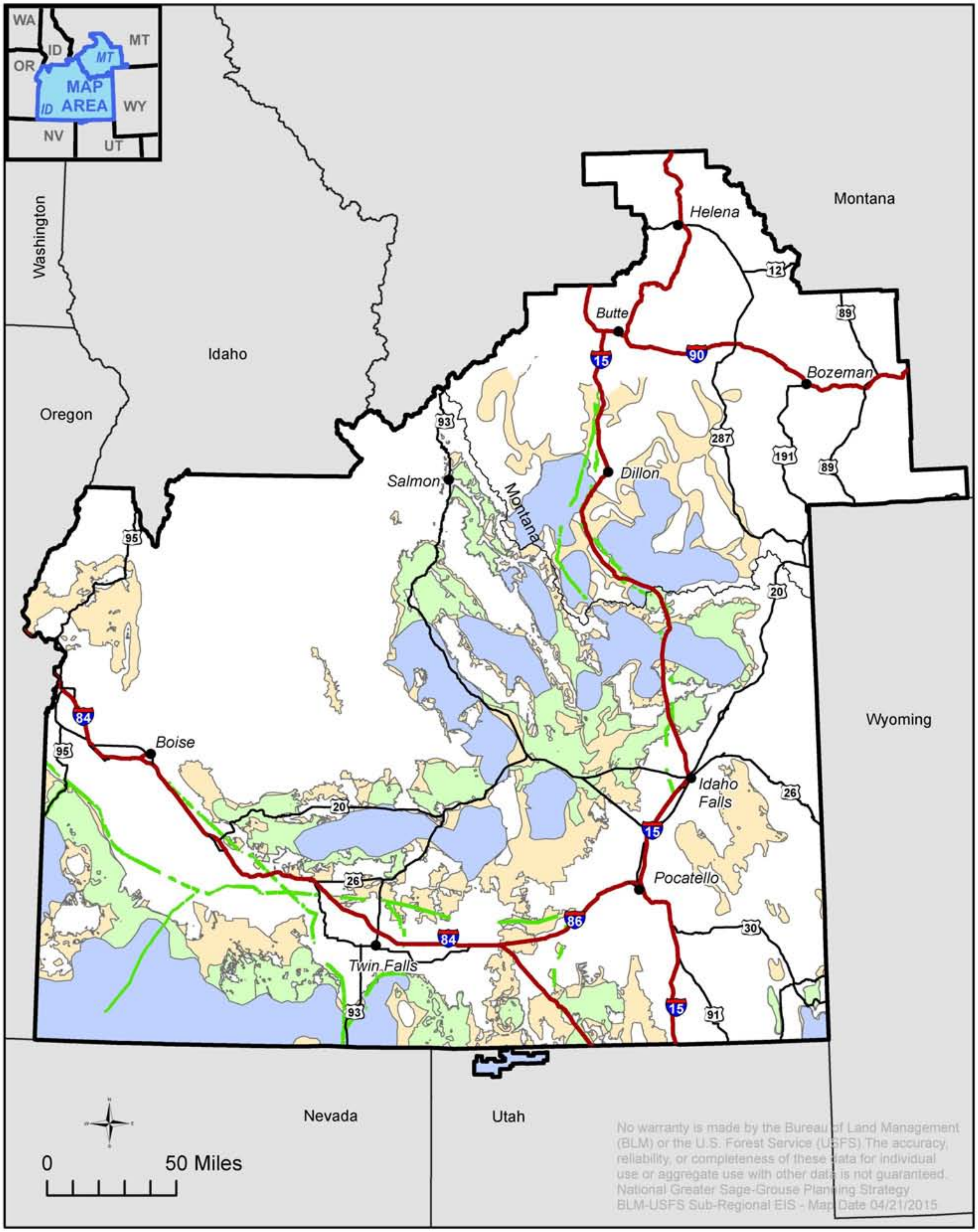
Habitat Management Area

- PHMA
- IHMA
- GHMA

Existing Utility Corridor

Idaho and SW Montana Sub-regional boundary

Figure 2-51
Alternative E: Existing Designated Utility Corridors



Habitat Management Area

- PHMA
- IHMA
- GHMA
- Existing Utility Corridor
- *Idaho and SW Montana Sub-regional boundary*

Figure 2-52
Alternative F: Existing Designated Utility Corridors

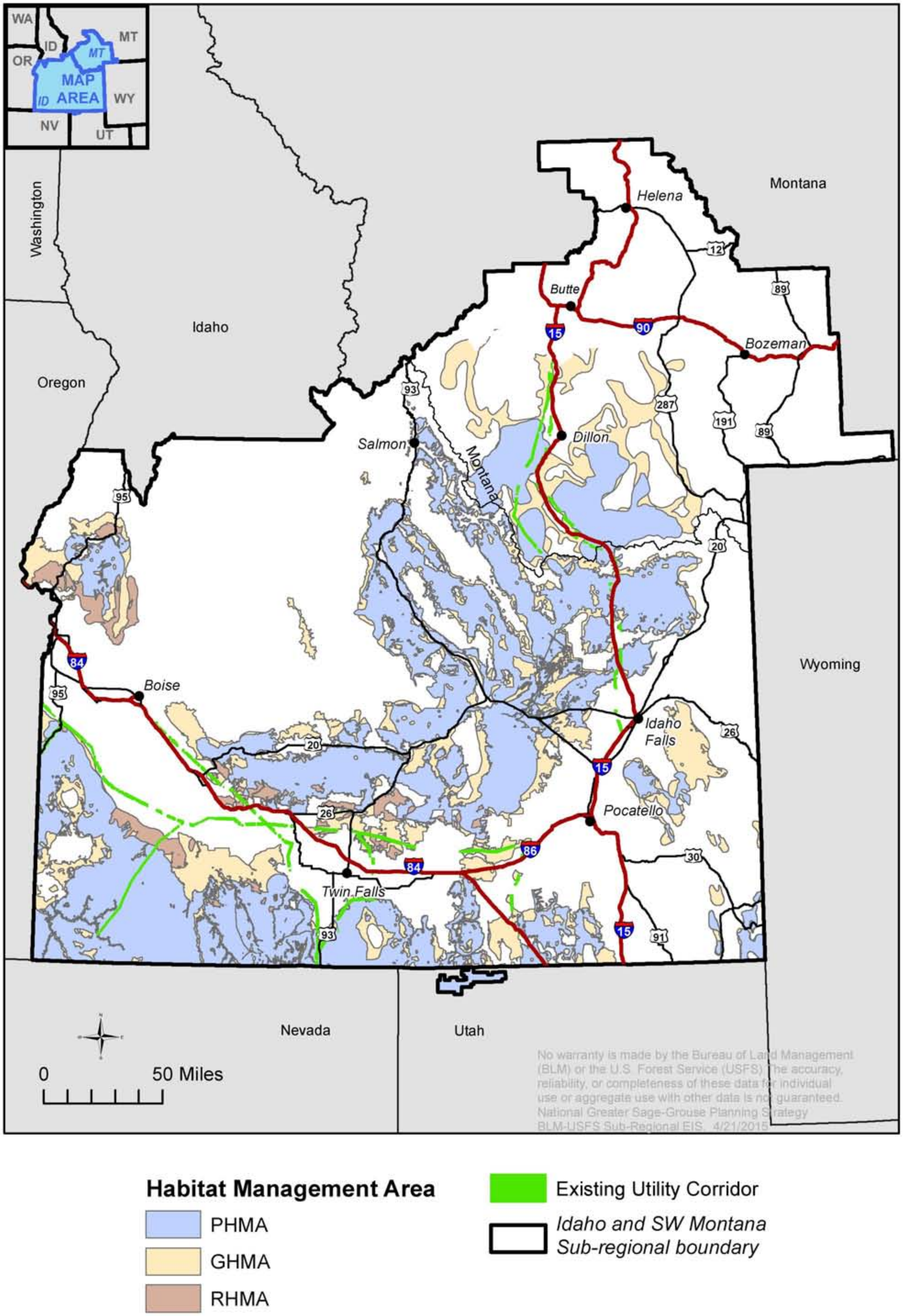
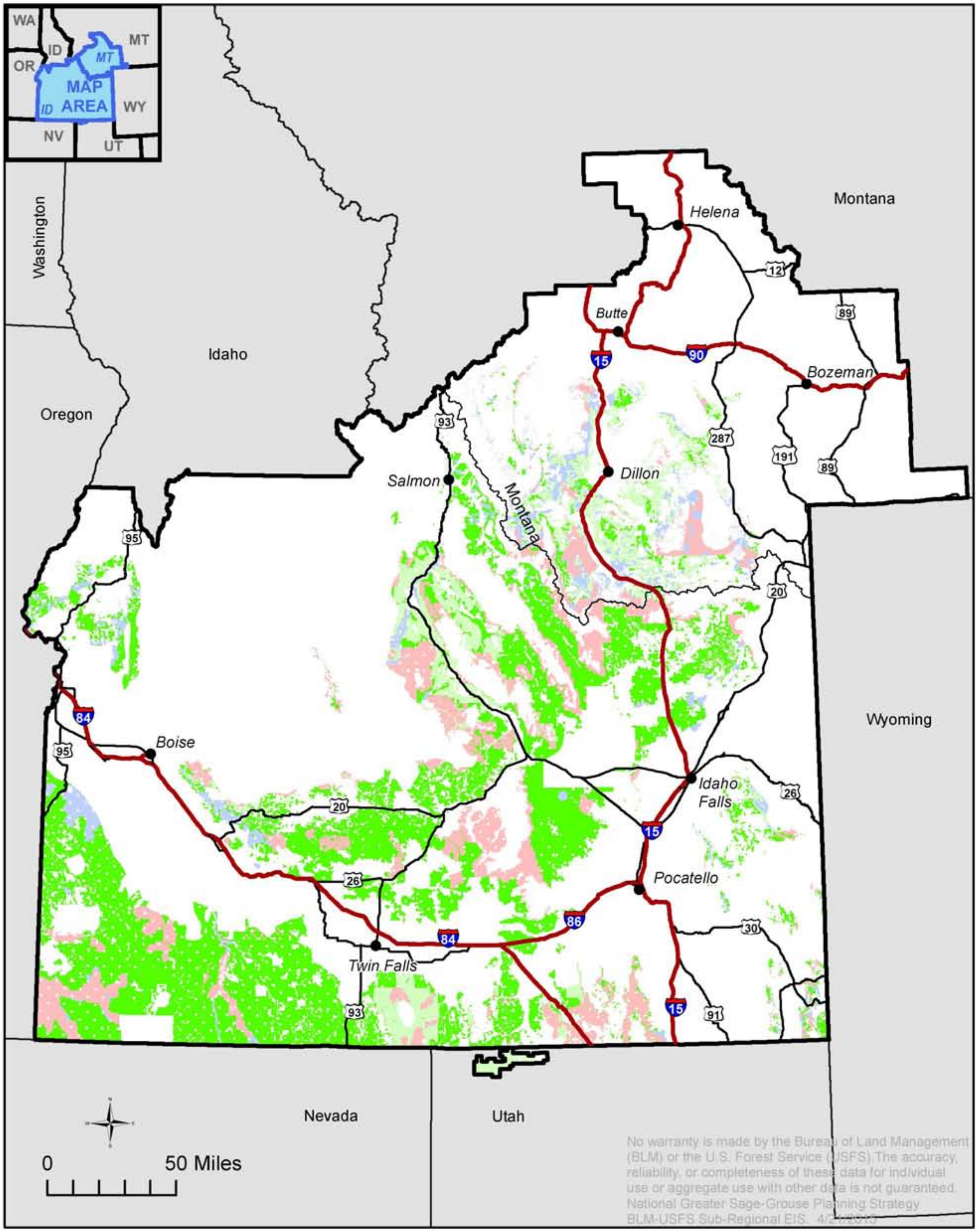


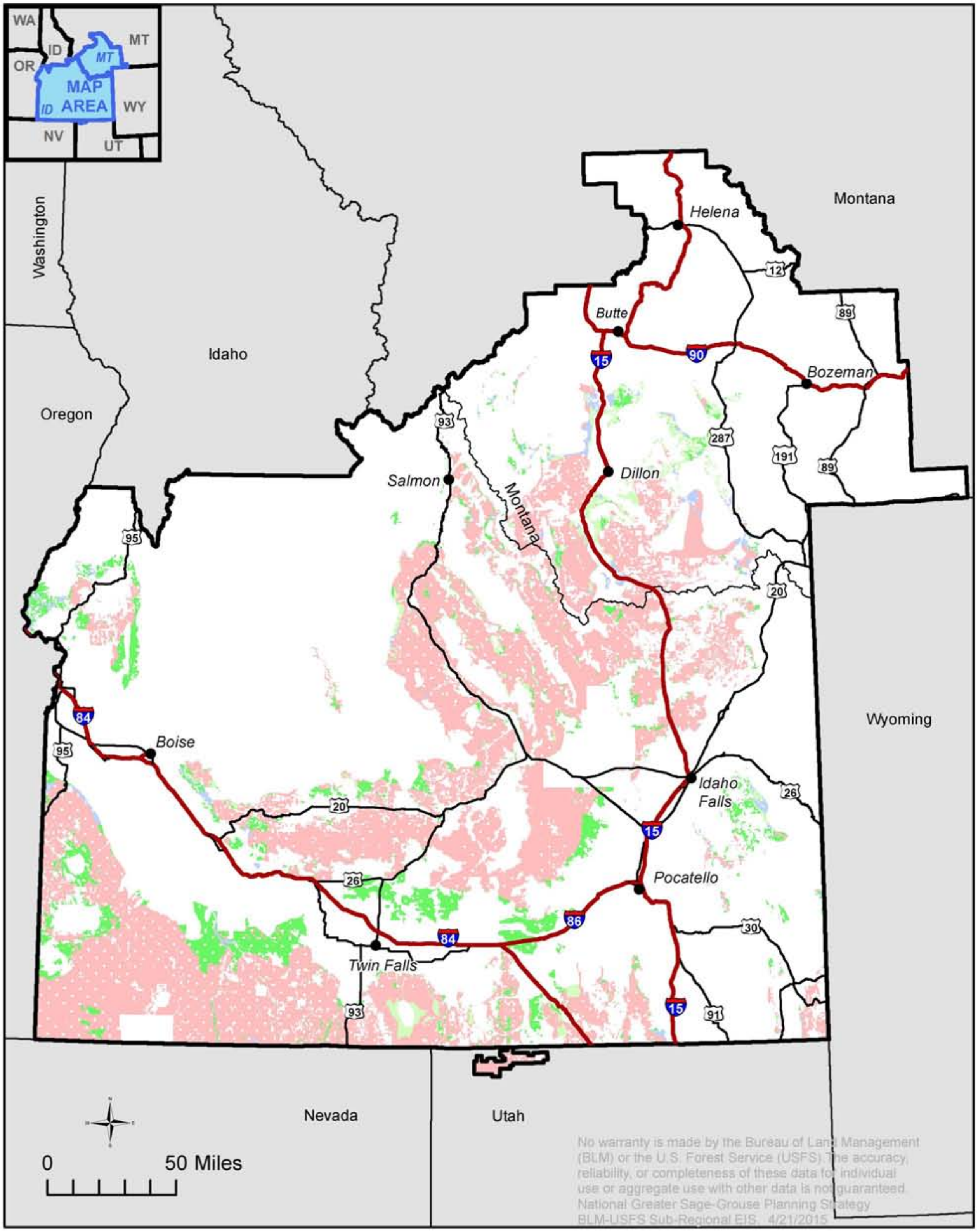
Figure 2-53
Alternative A: Fluid Mineral Resource Allocations
Oil and Gas



Constraint

- Closed to leasing
- Open to leasing, NSO
- Open to leasing, moderate constraints
- Open to leasing, standard lease stips
- *Idaho and SW Montana Sub-regional boundary*

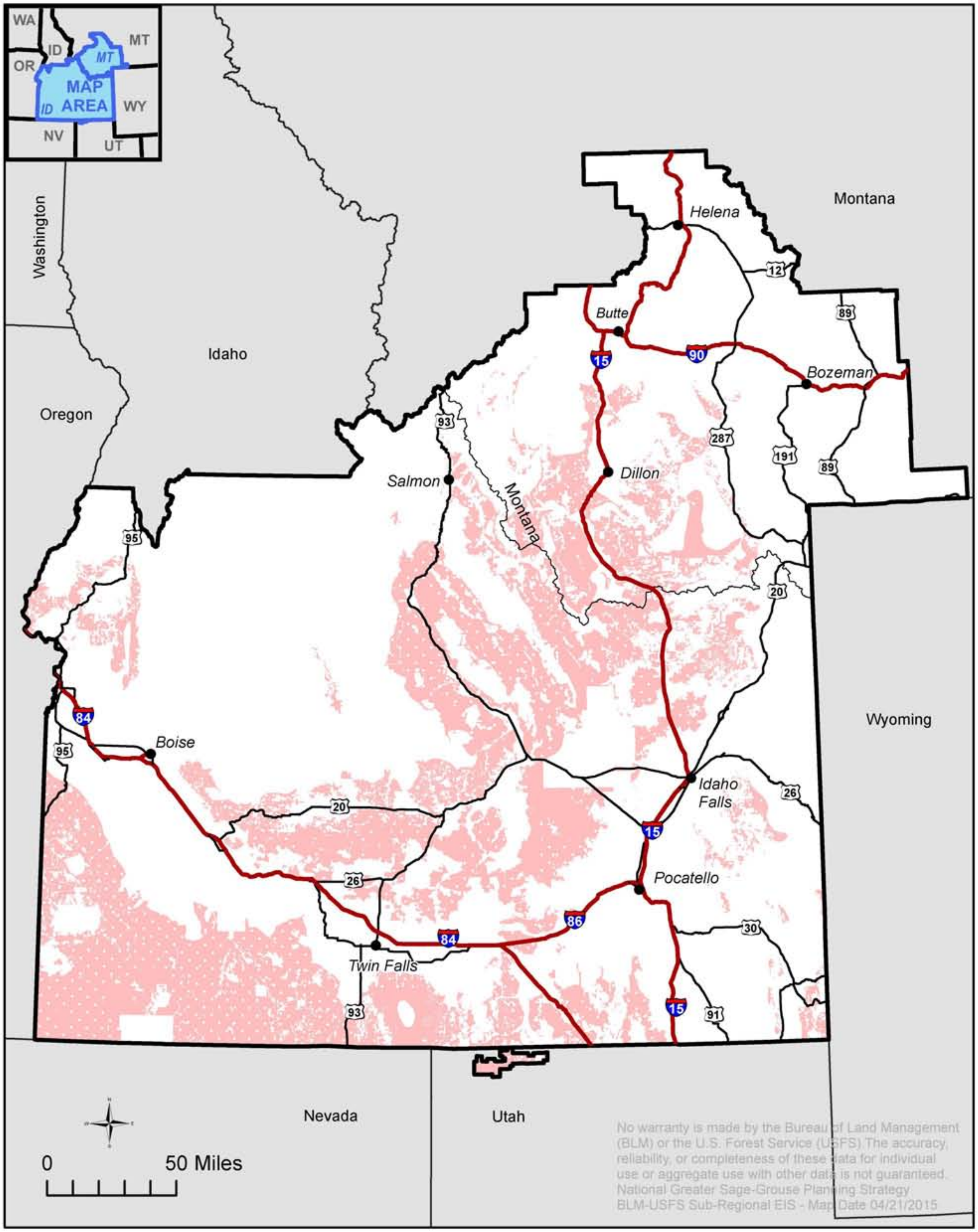
Figure 2-54
Alternative B: Fluid Mineral Resource Allocations
Oil and Gas



Constraint

- Closed to leasing
- Open to leasing, NSO
- Open to leasing, moderate constraints
- Open to leasing, standard lease stips
- *Idaho and SW Montana Sub-regional boundary*

Figure 2-55
Alternative C: Fluid Mineral Resource Allocations
Oil and Gas

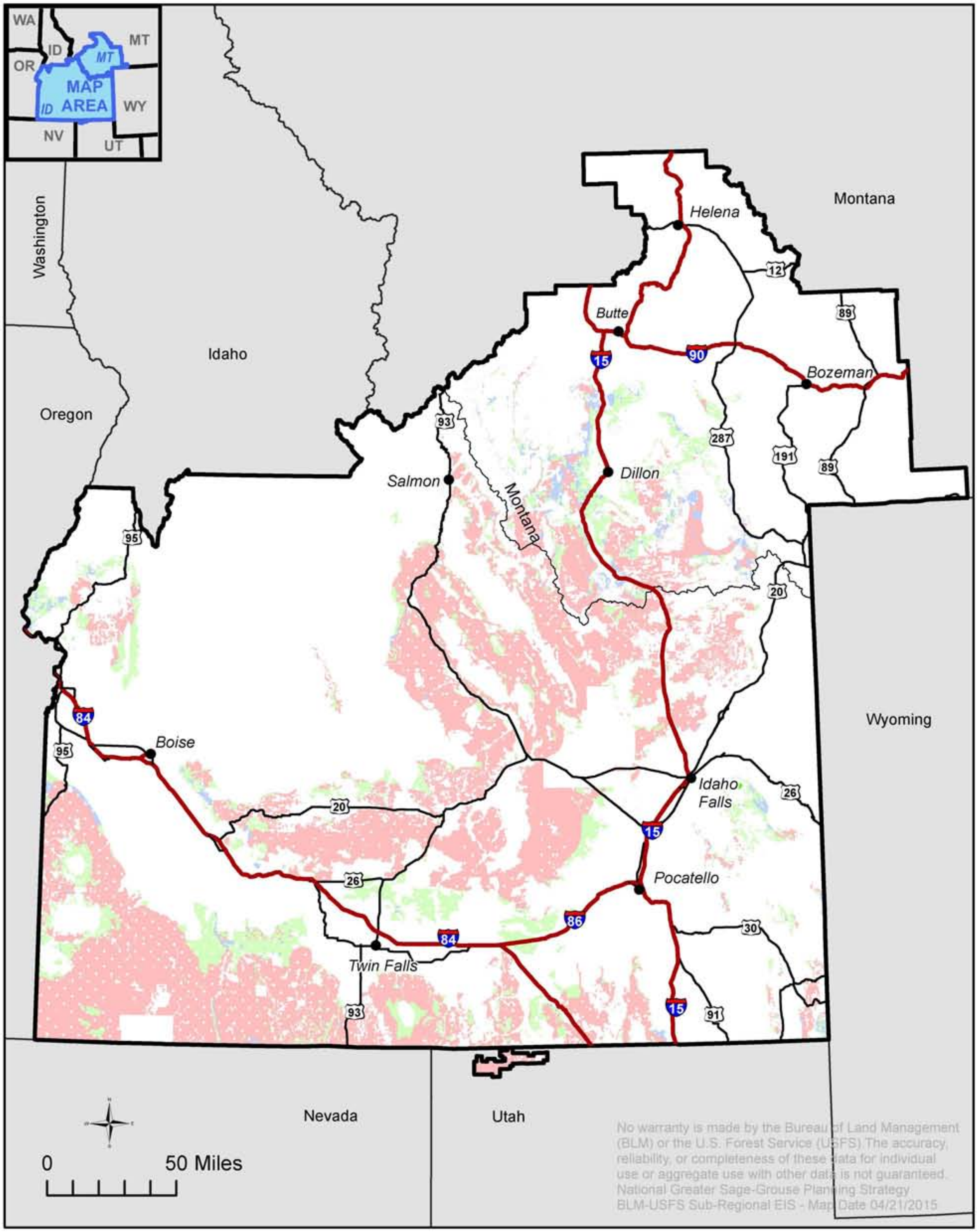


Constraint

Closed to leasing

Idaho and SW Montana Sub-regional boundary

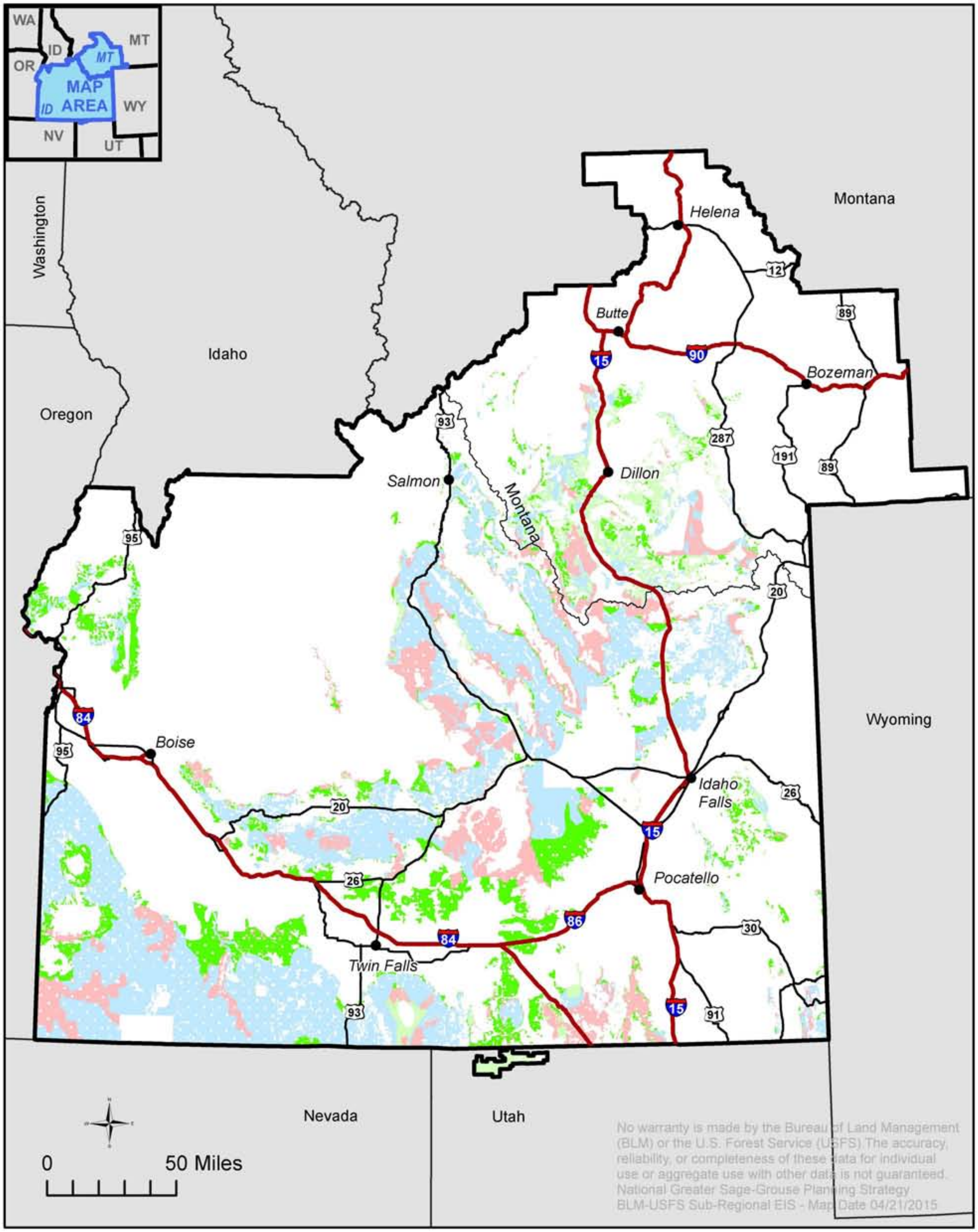
Figure 2-56
Alternative D: Fluid Mineral Resource Allocations
Oil and Gas



Constraint

- Closed to leasing
- Open to leasing, NSO
- Open to leasing, moderate constraints
- Open to leasing, standard lease stips
- *Idaho and SW Montana Sub-regional boundary*

Figure 2-56
Alternative E: Fluid Mineral Resource Allocations
Oil and Gas



Constraint

- Closed to leasing
- Open to leasing, NSO
- Open to leasing, moderate constraints
- Open to leasing, standard lease stips
- *Idaho and SW Montana Sub-regional boundary*

Figure 2-58
Alternative F: Fluid Mineral Resource Allocations
Oil and Gas

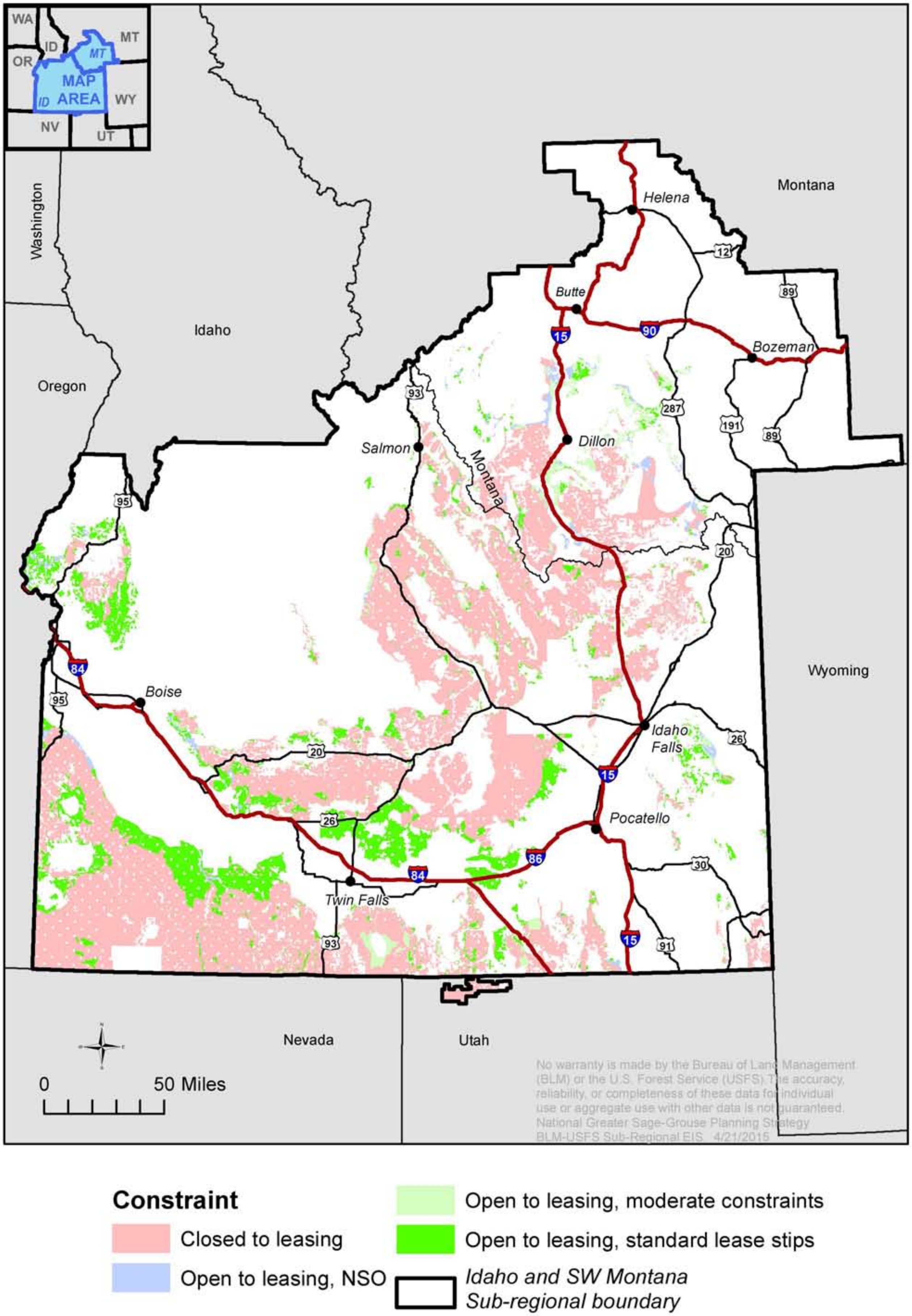
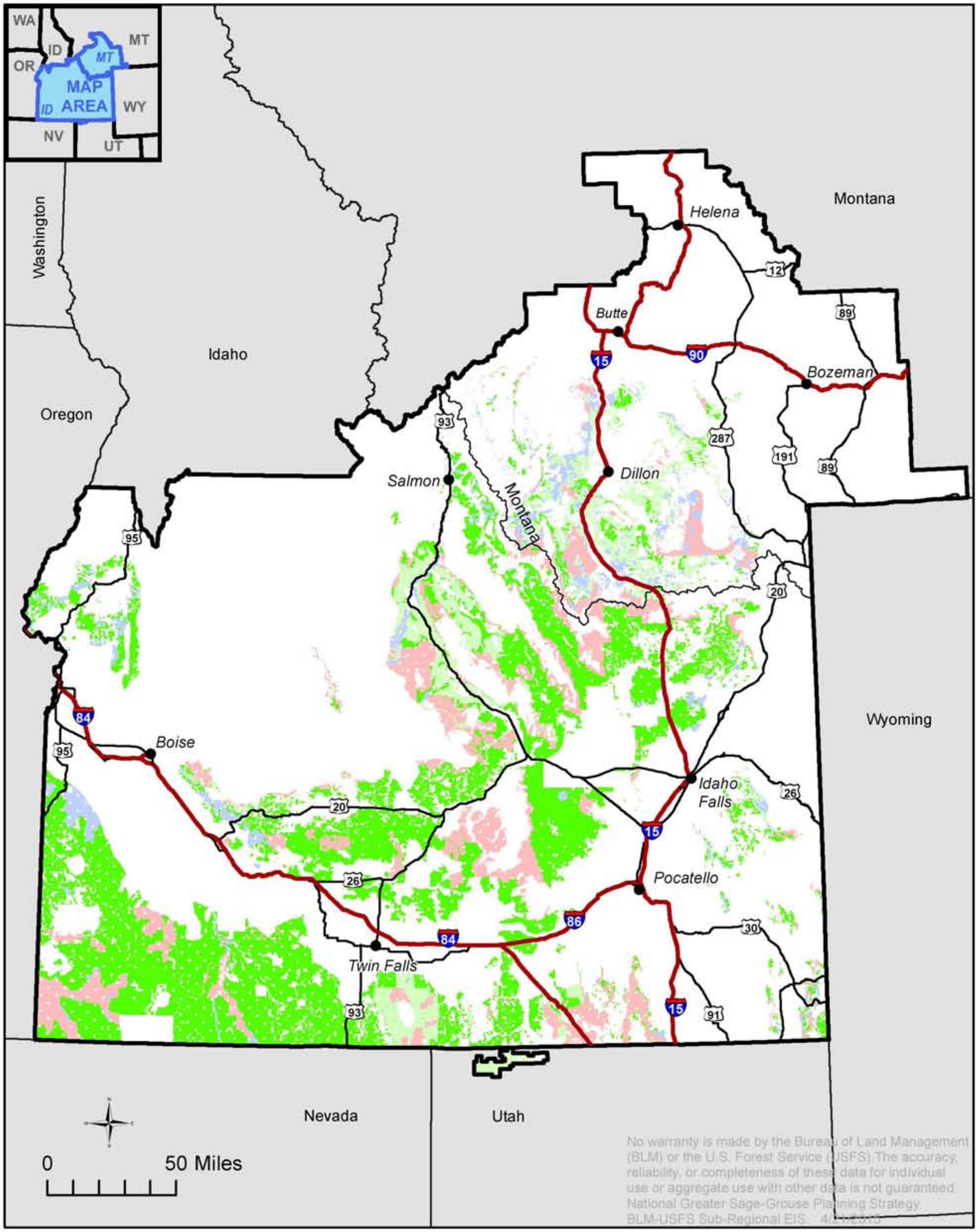


Figure 2-59
Alternative A: Fluid Mineral Resource Allocations
Geothermal

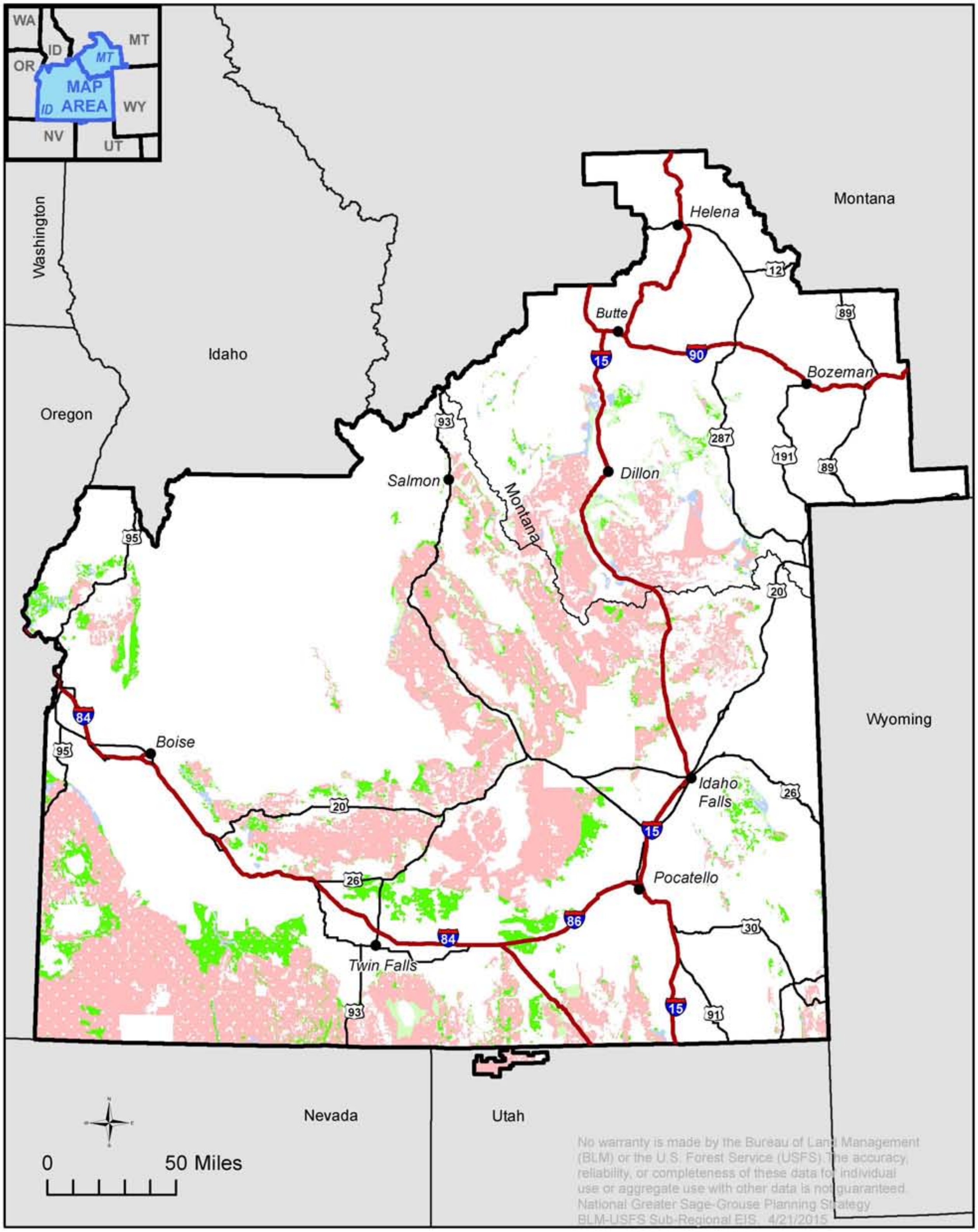


Constraint

- Closed to leasing
- Open to leasing, NSO
- Open to leasing, moderate constraints
- Open to leasing, standard lease stips

Idaho and SW Montana Sub-regional boundary

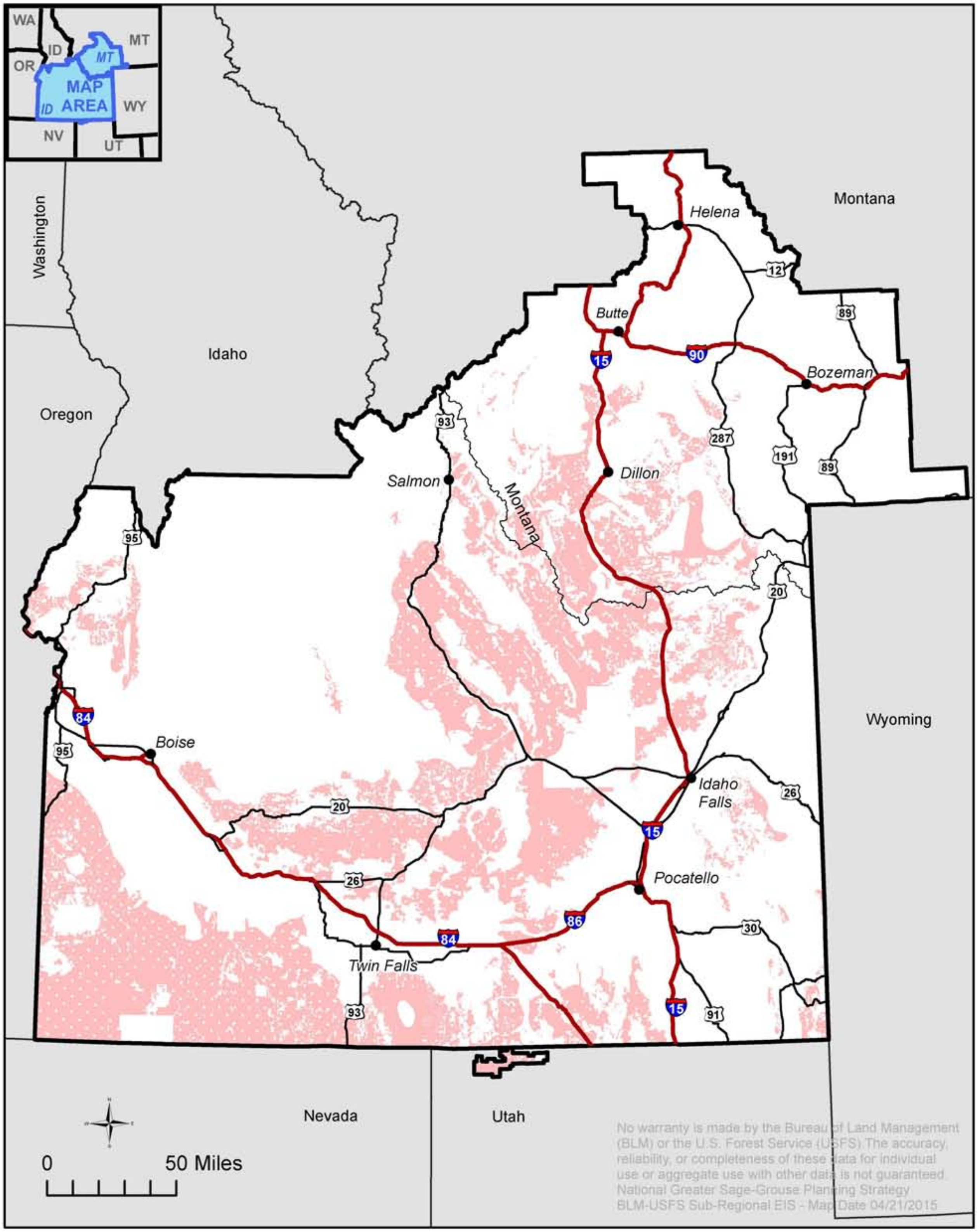
Figure 2-60
Alternative B: Fluid Mineral Resource Allocations
Geothermal



Constraint

- Closed to leasing
- Open to leasing, NSO
- Open to leasing, moderate constraints
- Open to leasing, standard lease stips
- *Idaho and SW Montana Sub-regional boundary*

Figure 2-61
Alternative C: Fluid Mineral Resource Allocations
Geothermal



Constraint

Closed to leasing

Idaho and SW Montana Sub-regional boundary

Figure 2-62
Alternative D: Fluid Mineral Resource Allocations
Geothermal

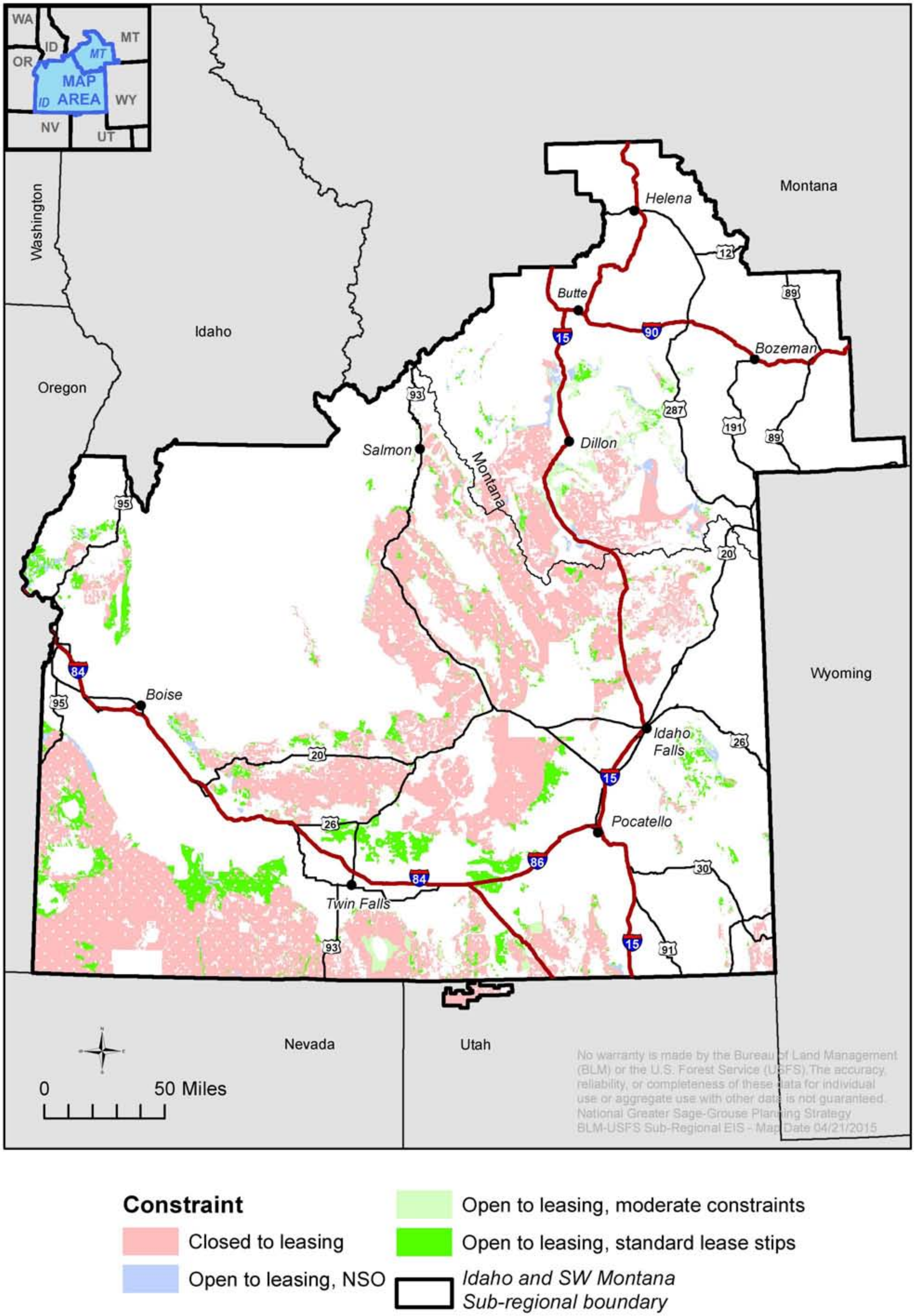


Figure 2-63
Alternative E: Fluid Mineral Resource Allocations
Geothermal

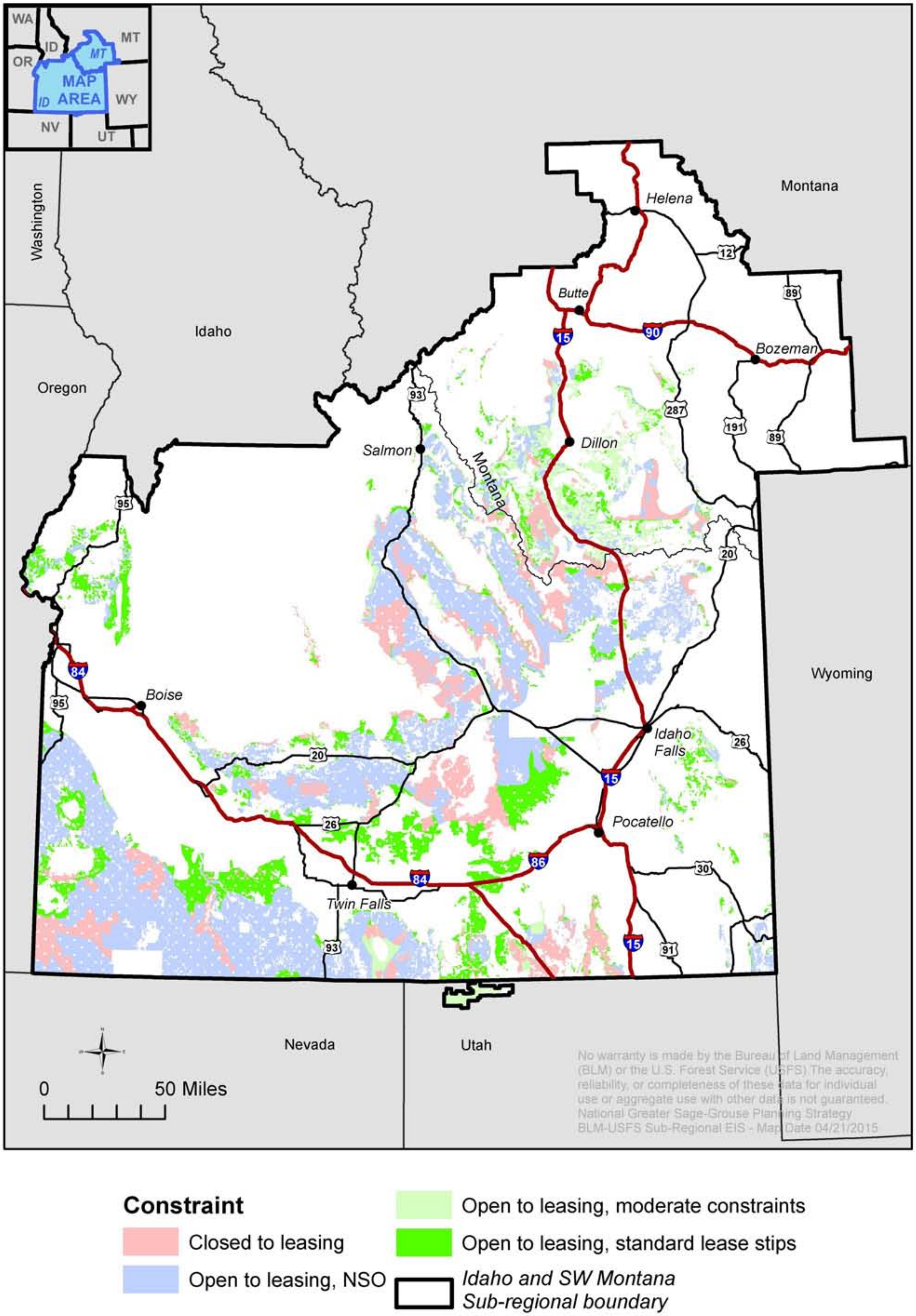
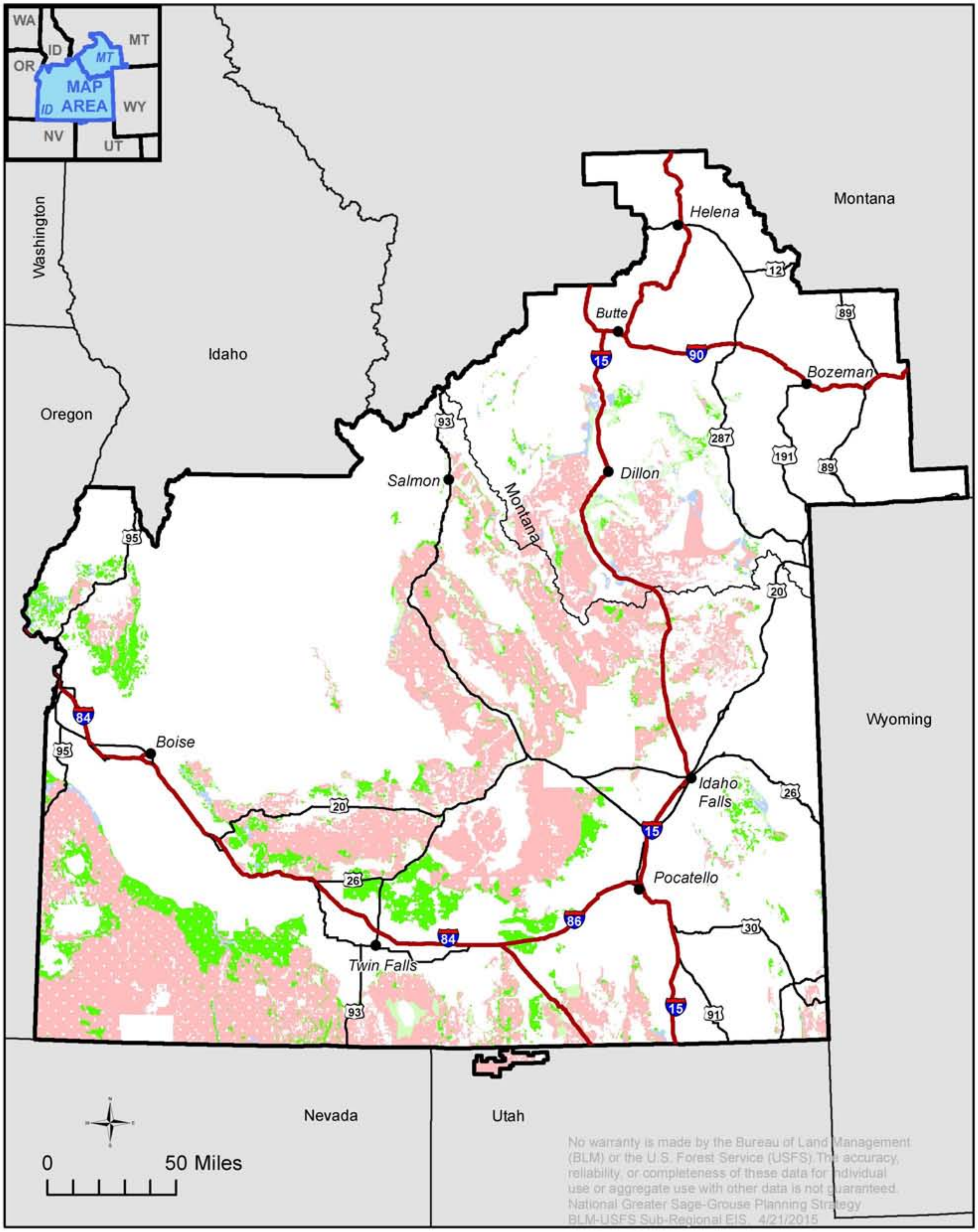


Figure 2-64
Alternative F: Fluid Mineral Resource Allocations
Geothermal



Constraint

- Closed to leasing
- Open to leasing, NSO
- Open to leasing, moderate constraints
- Open to leasing, standard lease stips
- *Idaho and SW Montana Sub-regional boundary*

Figure 2-65
Alternative A: Locatable Minerals Withdrawals

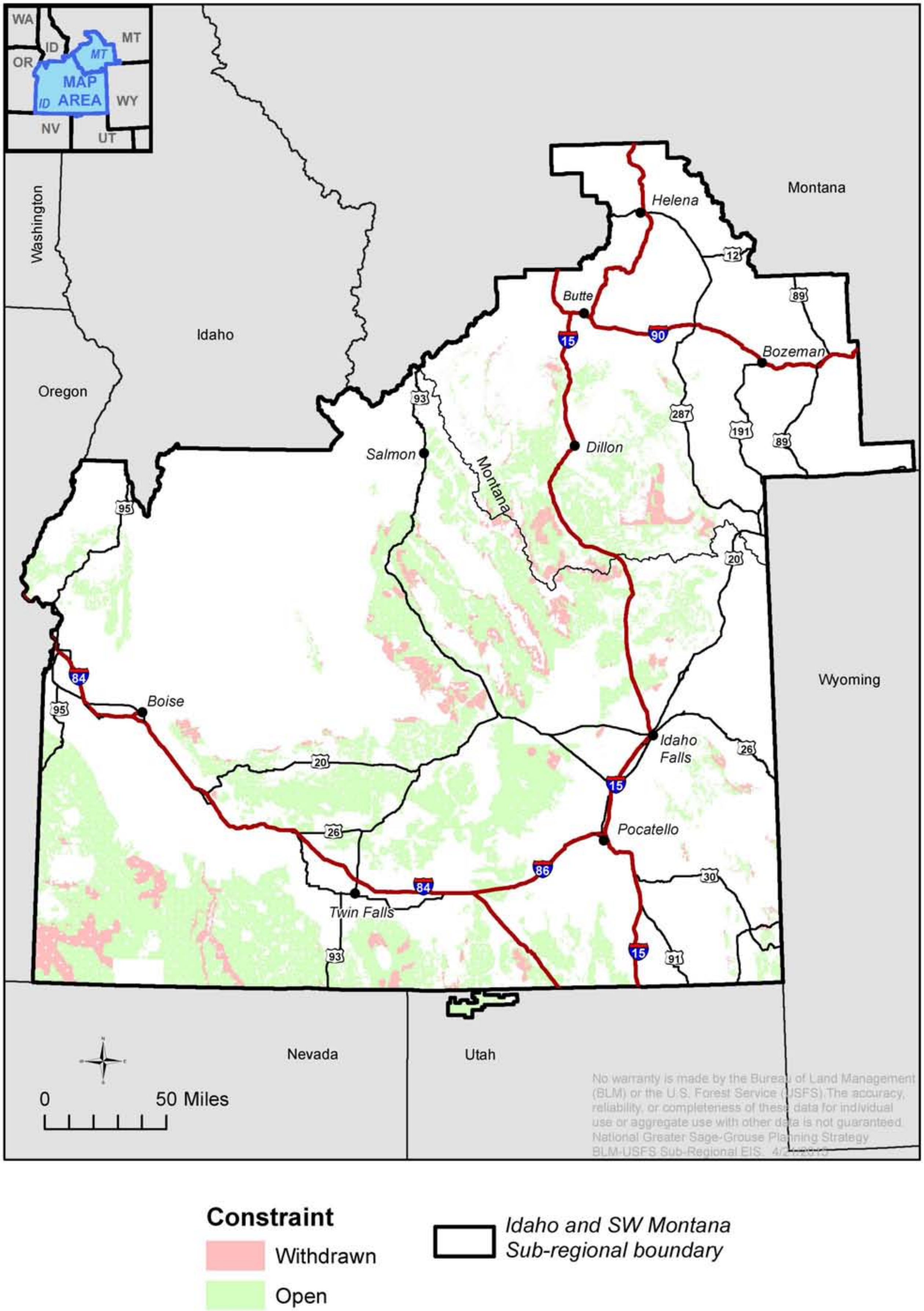
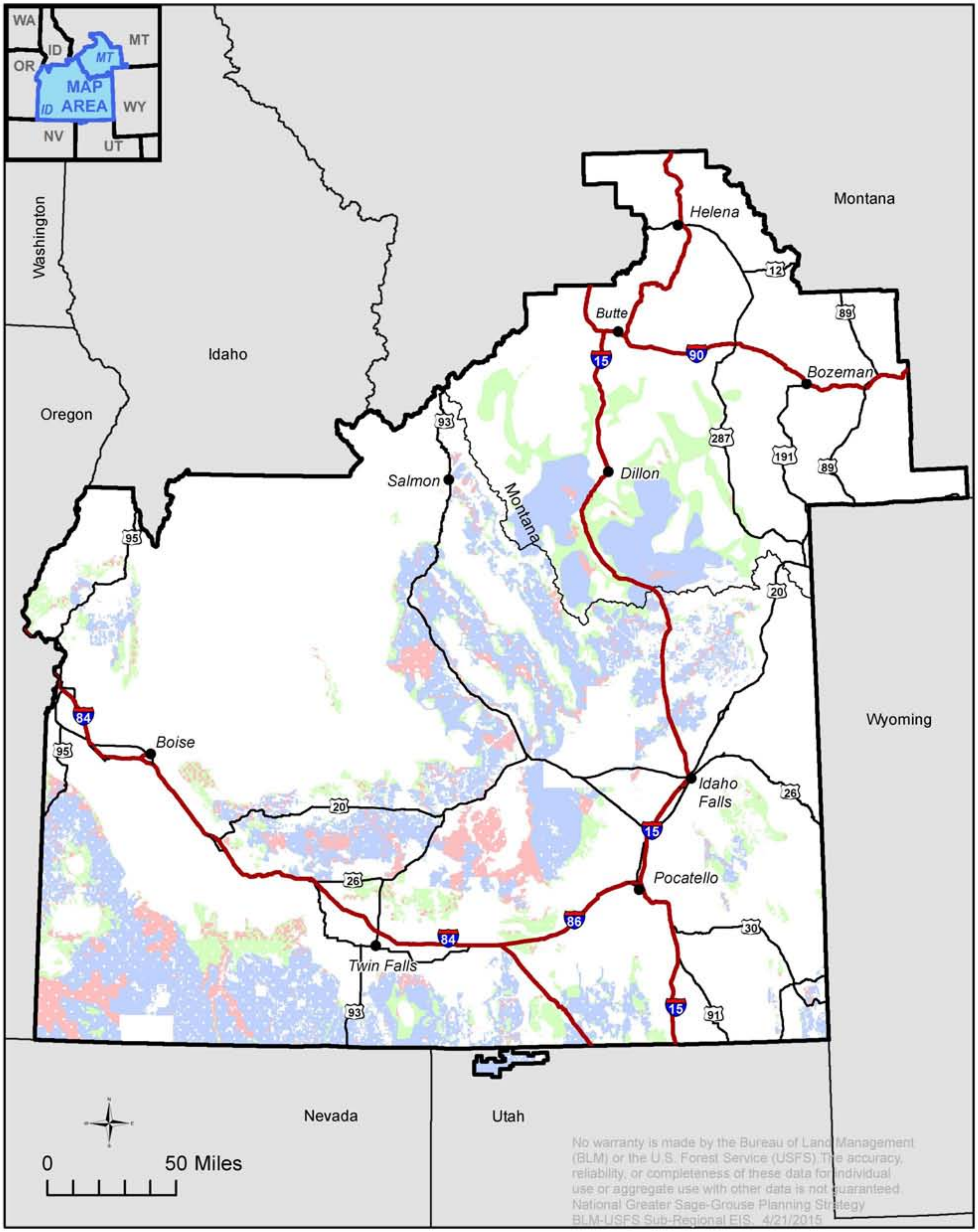


Figure 2-66
Alternative B: Locatable Minerals Withdrawals



Constraint

- Withdrawn
- Open
- Recommended for withdrawal

Idaho and SW Montana Sub-regional boundary

Figure 2-67
Alternative C: Locatable Minerals Withdrawals

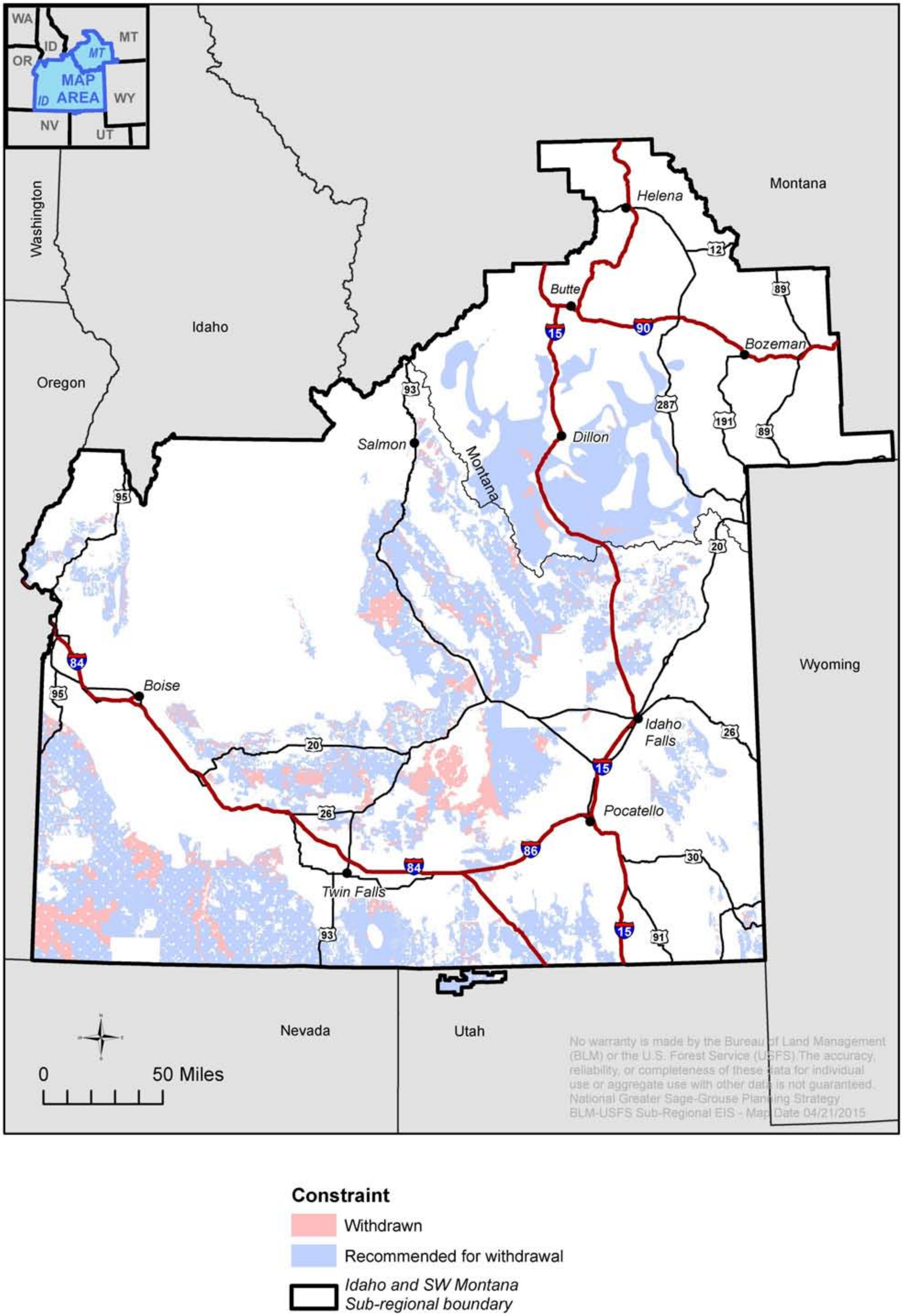
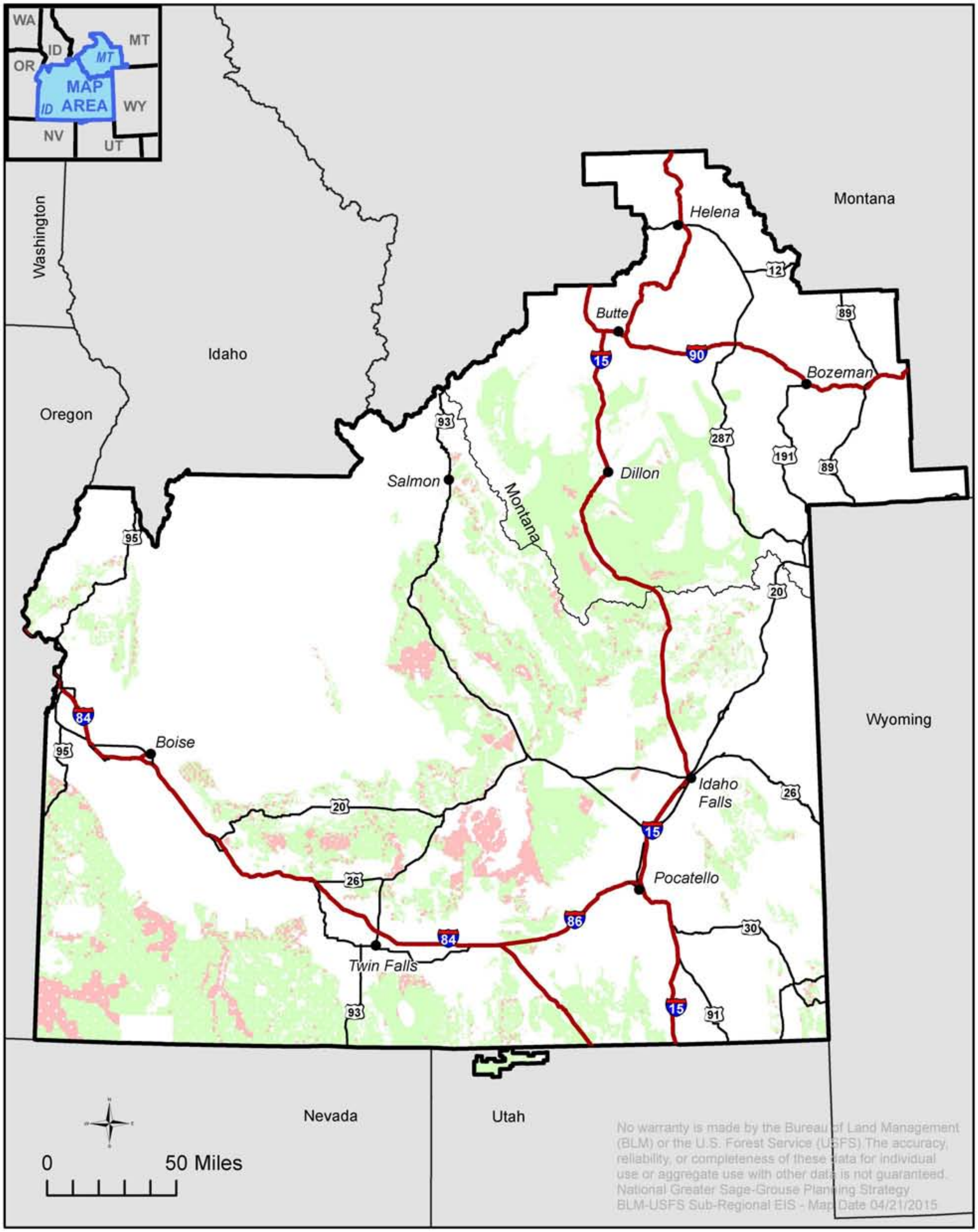


Figure 2-68
Alternative D: Locatable Minerals Withdrawals



Constraint

Withdrawn

Open

Idaho and SW Montana Sub-regional boundary

Figure 2-69
Alternative E: Locatable Minerals Withdrawals

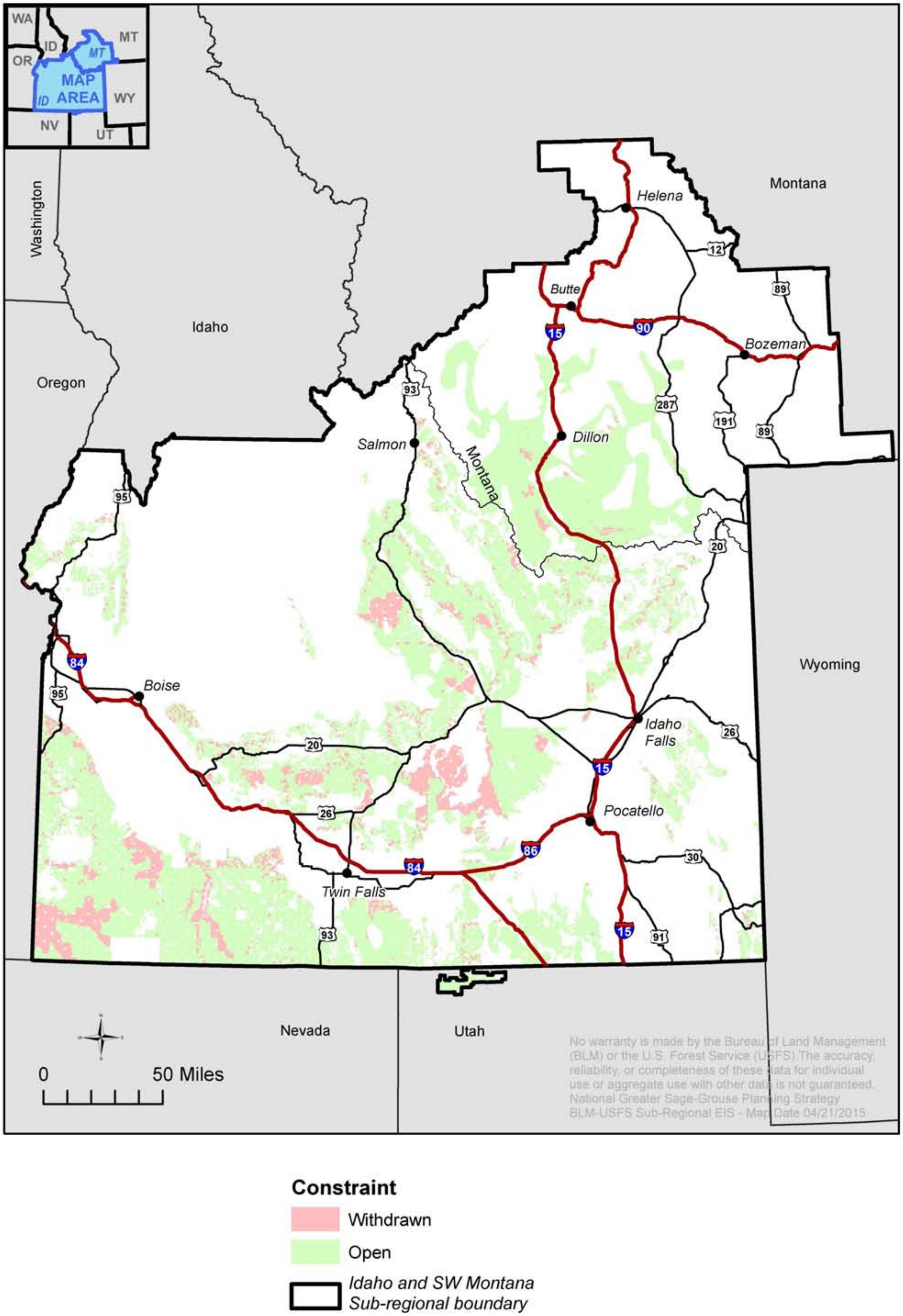
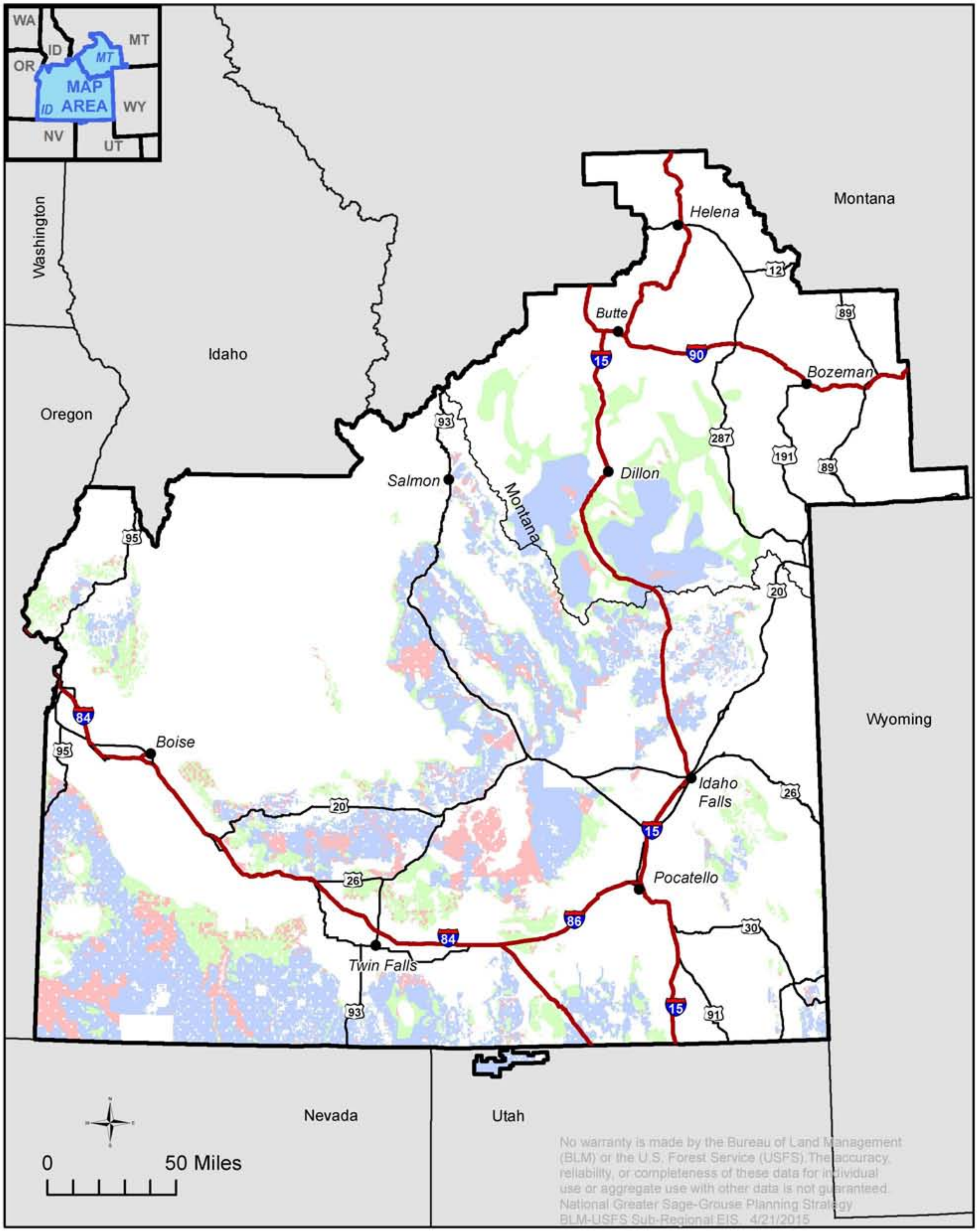


Figure 2-70
Alternative F: Locatable Minerals Withdrawals

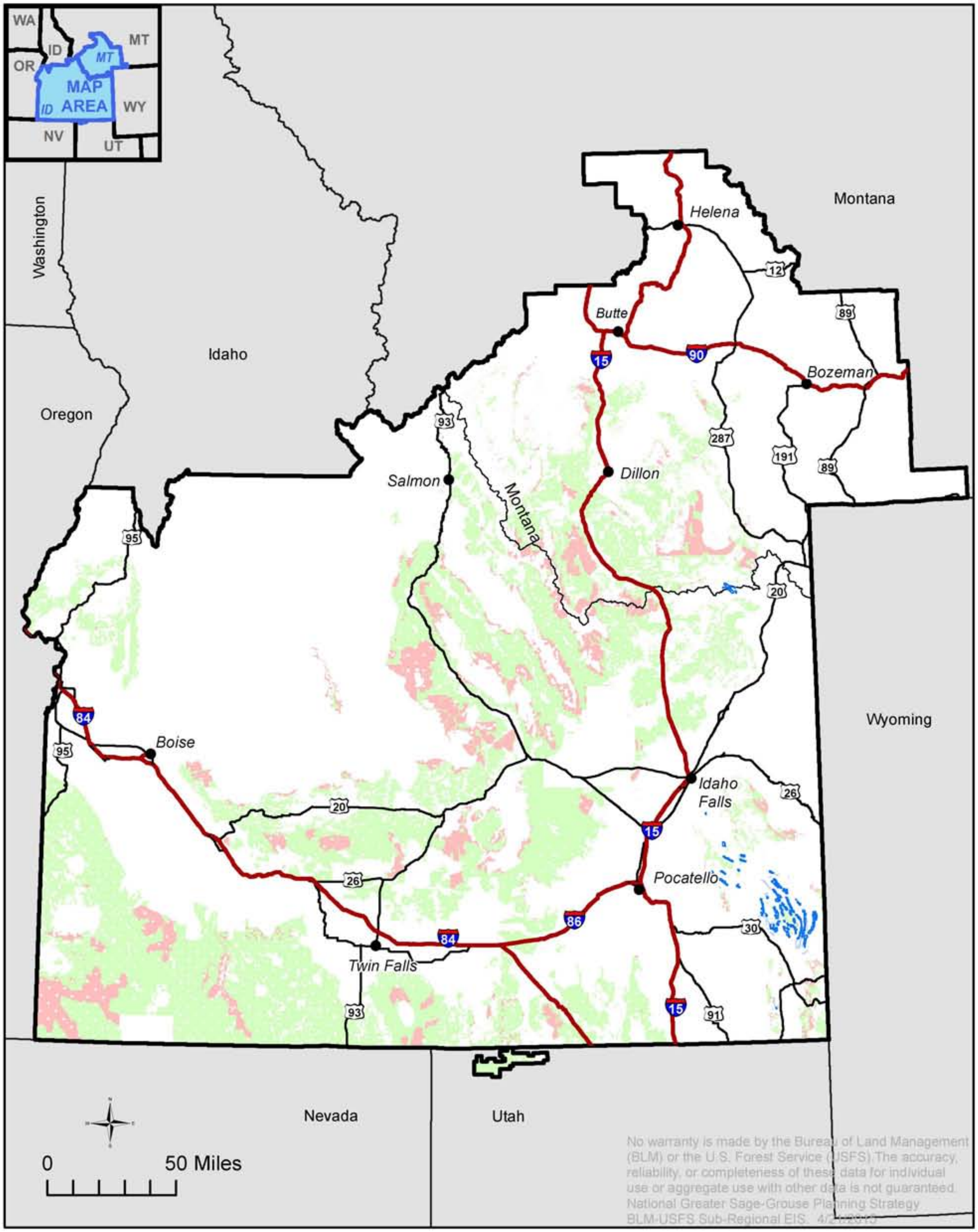


Constraint

- Withdrawn
- Open
- Recommended for withdrawal

Idaho and SW Montana Sub-regional boundary

Figure 2-71
Alternative A: Nonenergy Leasable Resource Allocations



Phosphate Leases

Known Phosphate Lease Areas

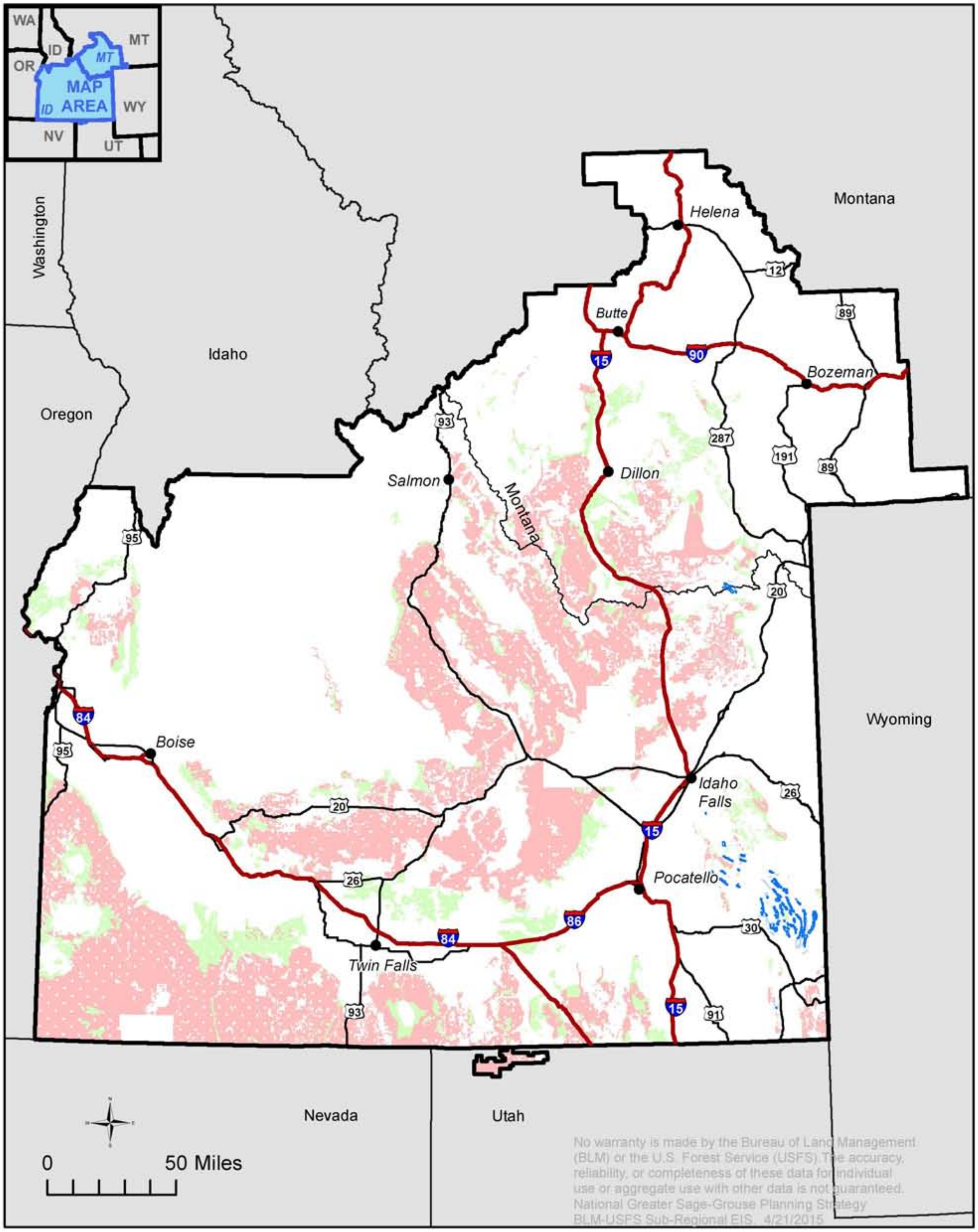
Constraint

Closed to non-energy leasing

Open to leasing

Idaho and SW Montana Sub-regional boundary

Figure 2-72
Alternative B: Nonenergy Leasable Resource Allocations



Phosphate Leases

Known Phosphate Lease Areas

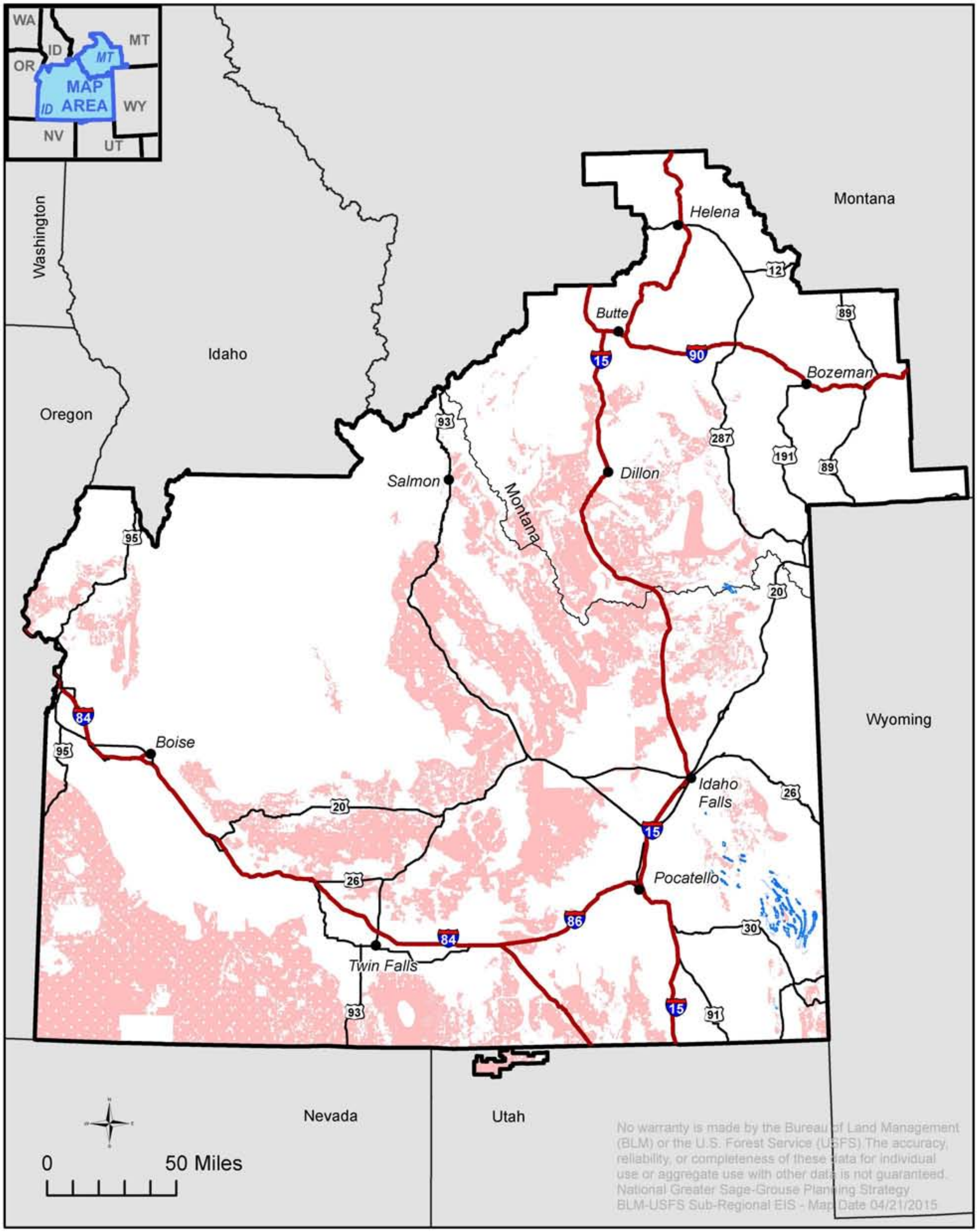
Constraint

Closed to non-energy leasing

Open to leasing

Idaho and SW Montana Sub-regional boundary

Figure 2-73
Alternative C: Nonenergy Leasable Resource Allocations



Phosphate Leases

Known Phosphate Lease Areas

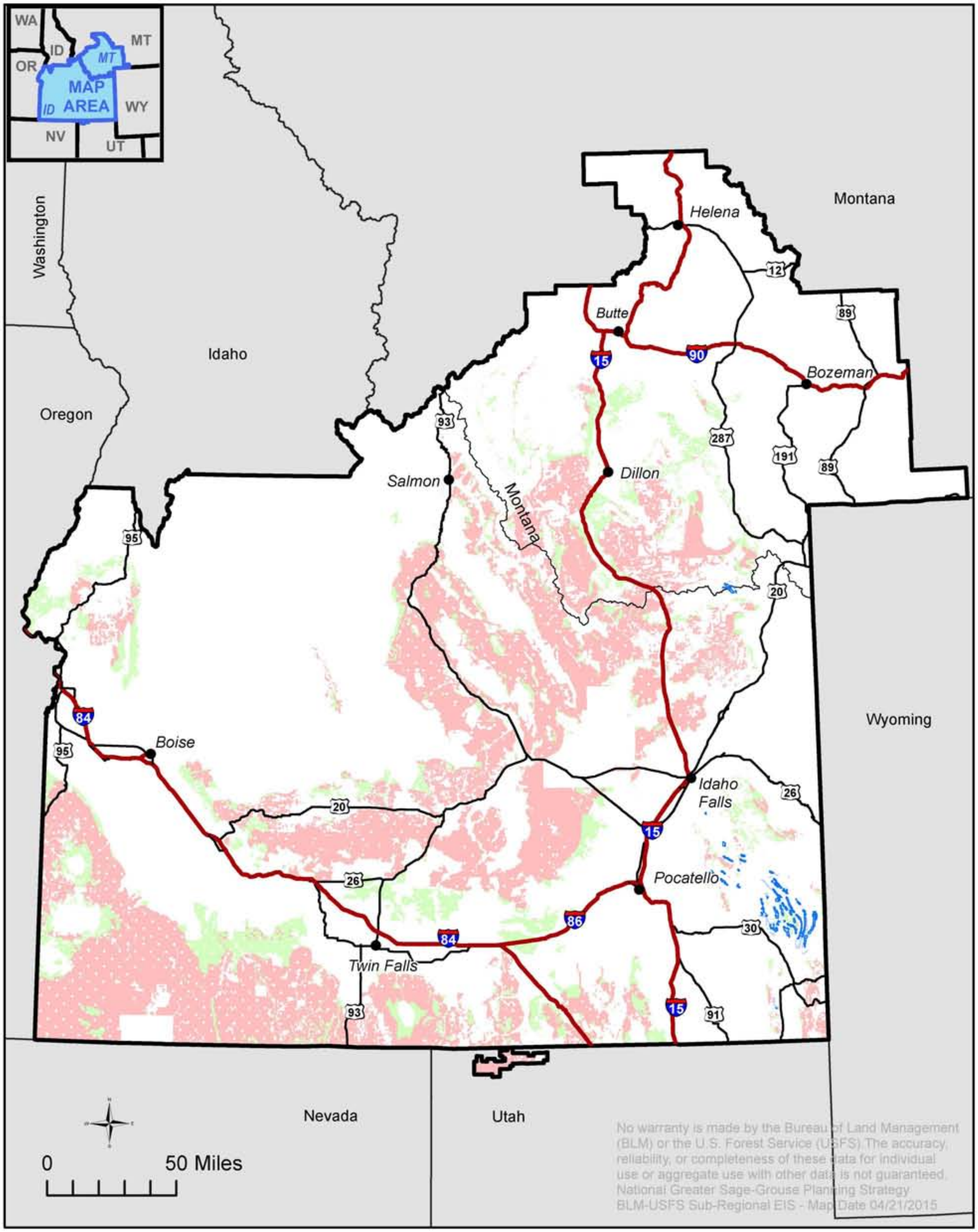
Constraint

Closed to non-energy leasing

Open to leasing

Idaho and SW Montana Sub-regional boundary

Figure 2-74
Alternative D: Nonenergy Leasable Resource Allocations



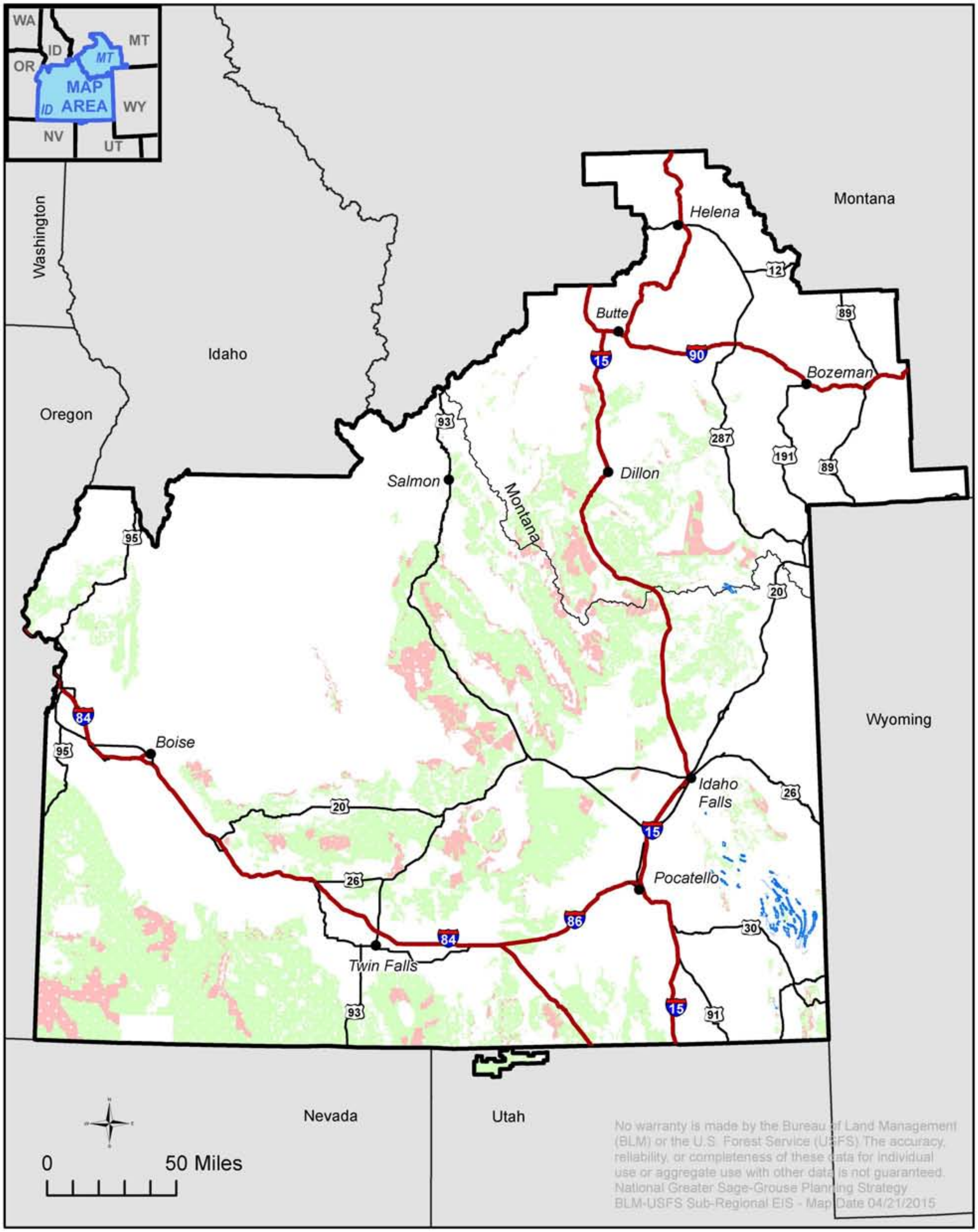
Phosphate Leases
Known Phosphate Lease Areas

Constraint

Closed to non-energy leasing
Open to leasing

Idaho and SW Montana Sub-regional boundary

Figure 2-75
Alternative E: Nonenergy Leasable Resource Allocations



Phosphate Leases

Known Phosphate Lease Areas

Constraint

Closed to non-energy leasing

Open to leasing

Idaho and SW Montana Sub-regional boundary

Figure 2-76
Alternative F: Nonenergy Leasable Resource Allocations

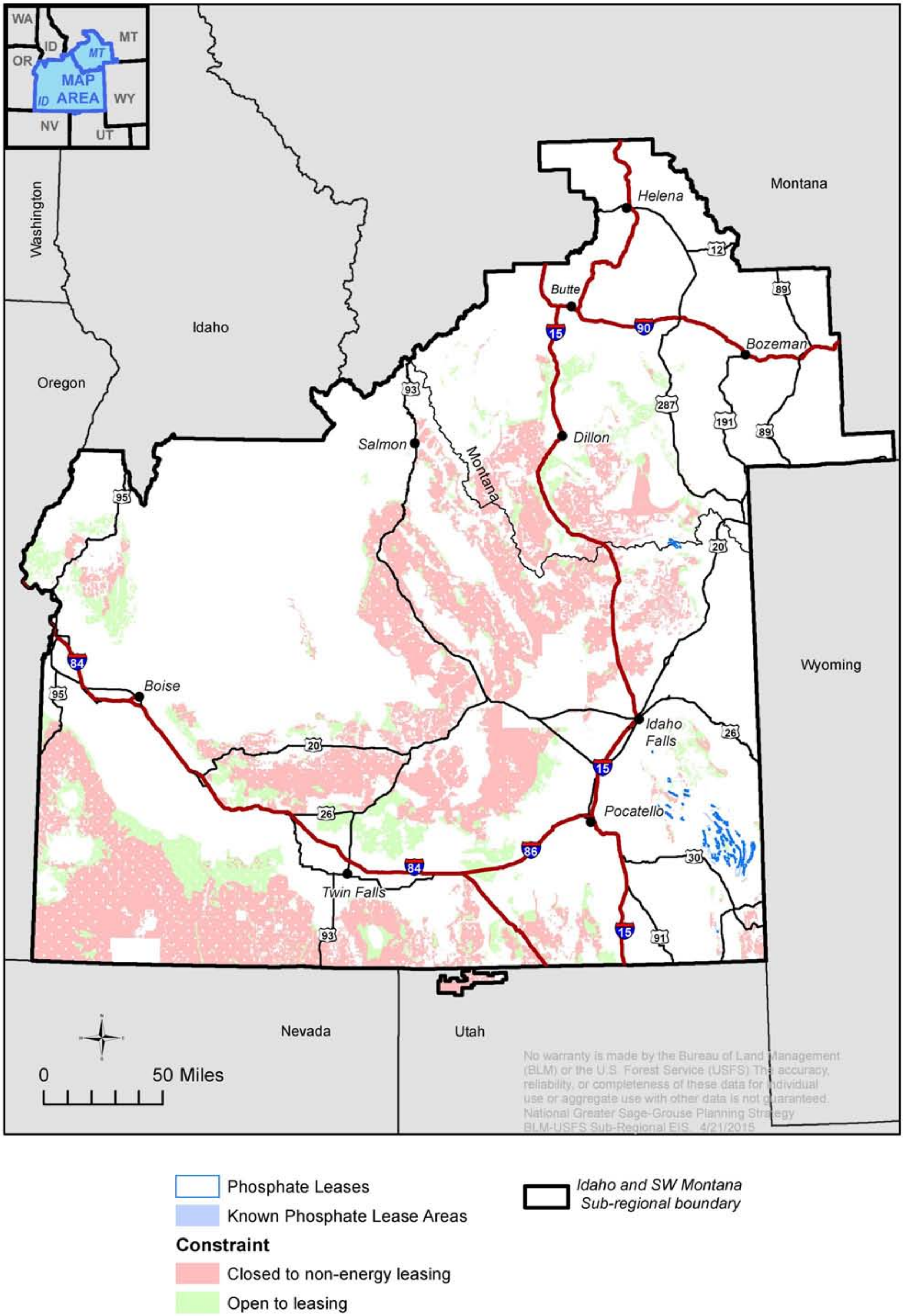
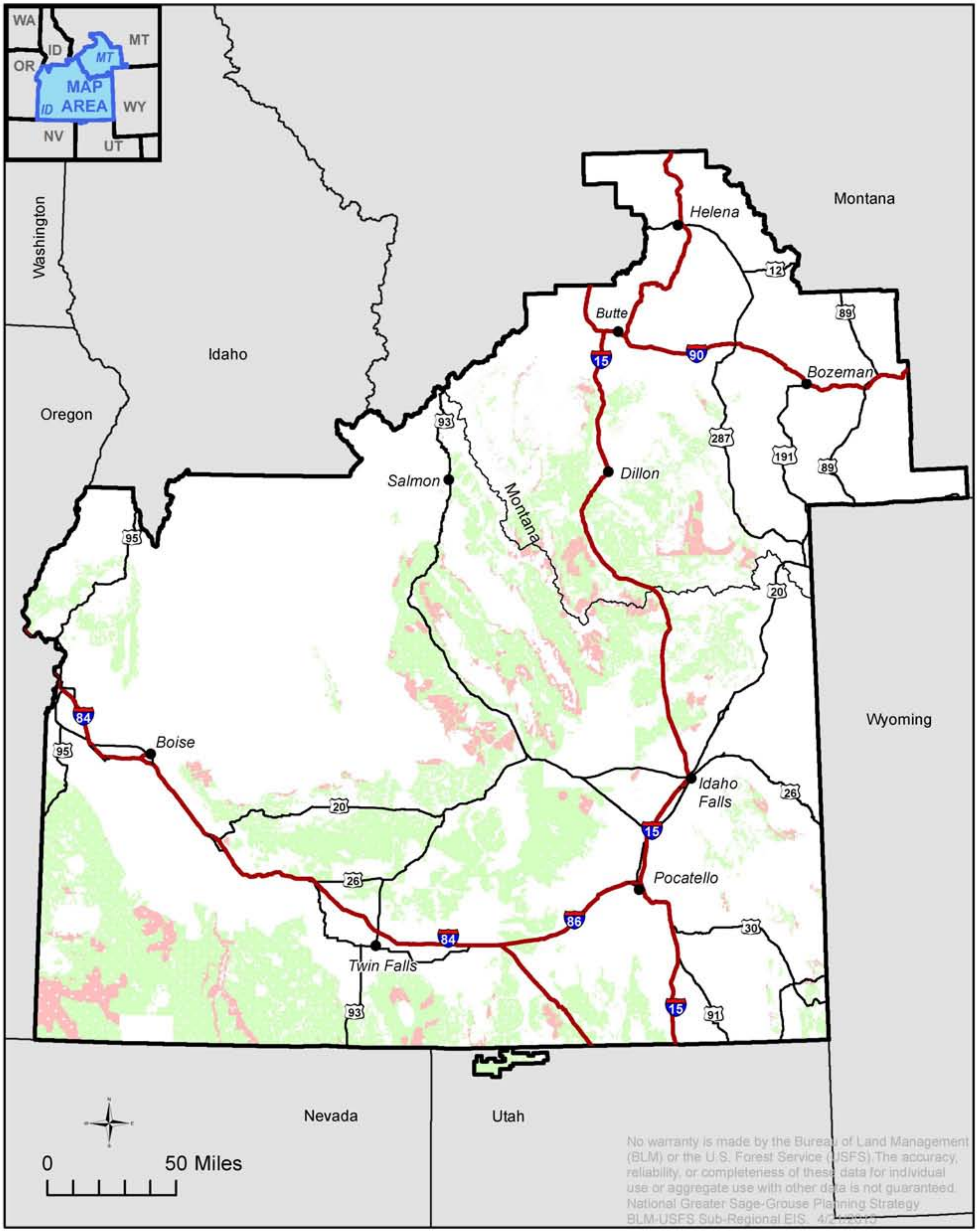


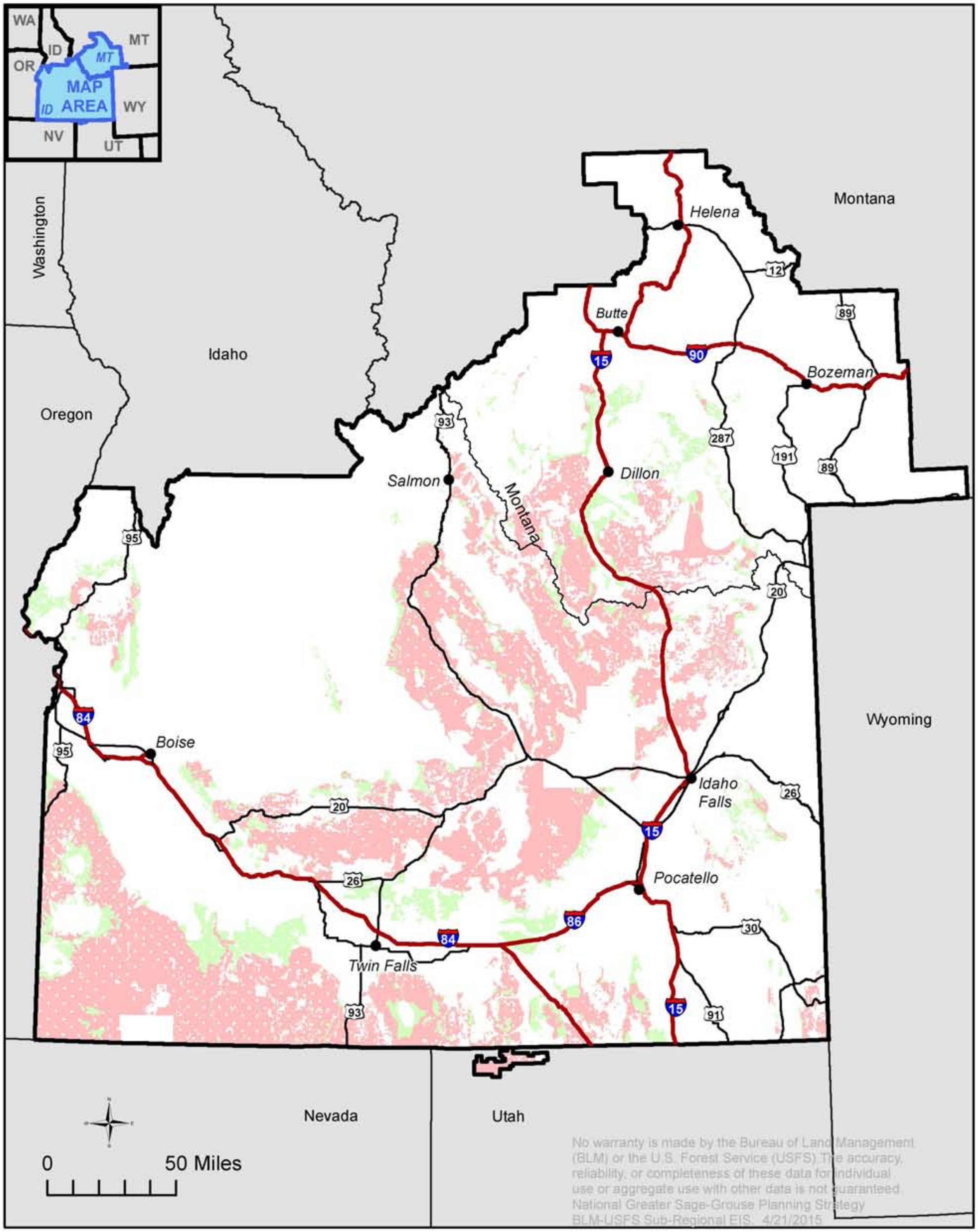
Figure 2-77
Alternative A: Saleable (Mineral Materials) Allocations



Constraint

- Closed to Saleable (Mineral Material Disposal)
- Open
- *Idaho and SW Montana Sub-regional boundary*

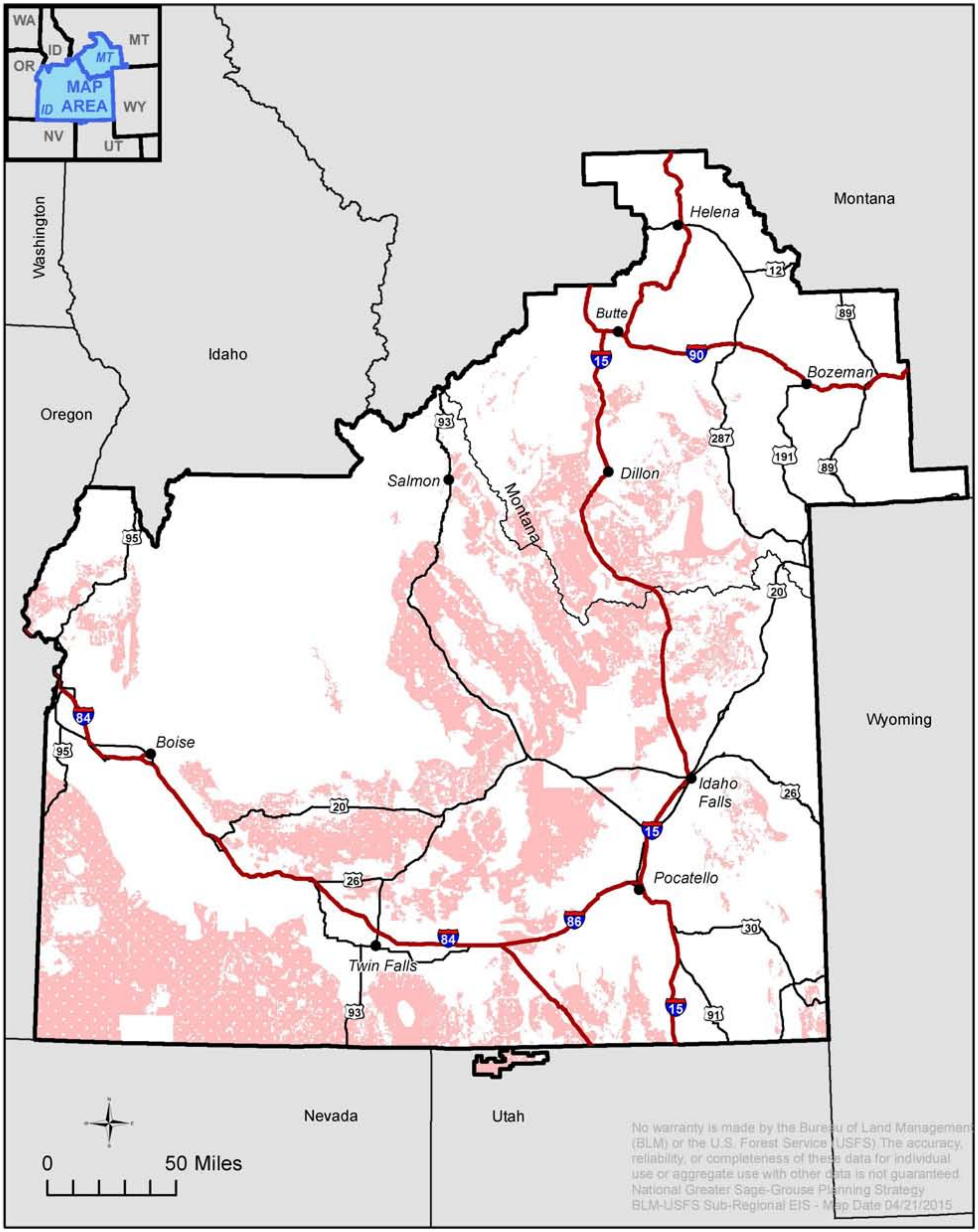
Figure 2-78
Alternative B: Saleable (Mineral Materials) Allocations



Constraint

- Closed to Saleable (Mineral Material Disposal)
- Open
- *Idaho and SW Montana Sub-regional boundary*

Figure 2-79
Alternative C: Saleable (Mineral Materials) Allocations

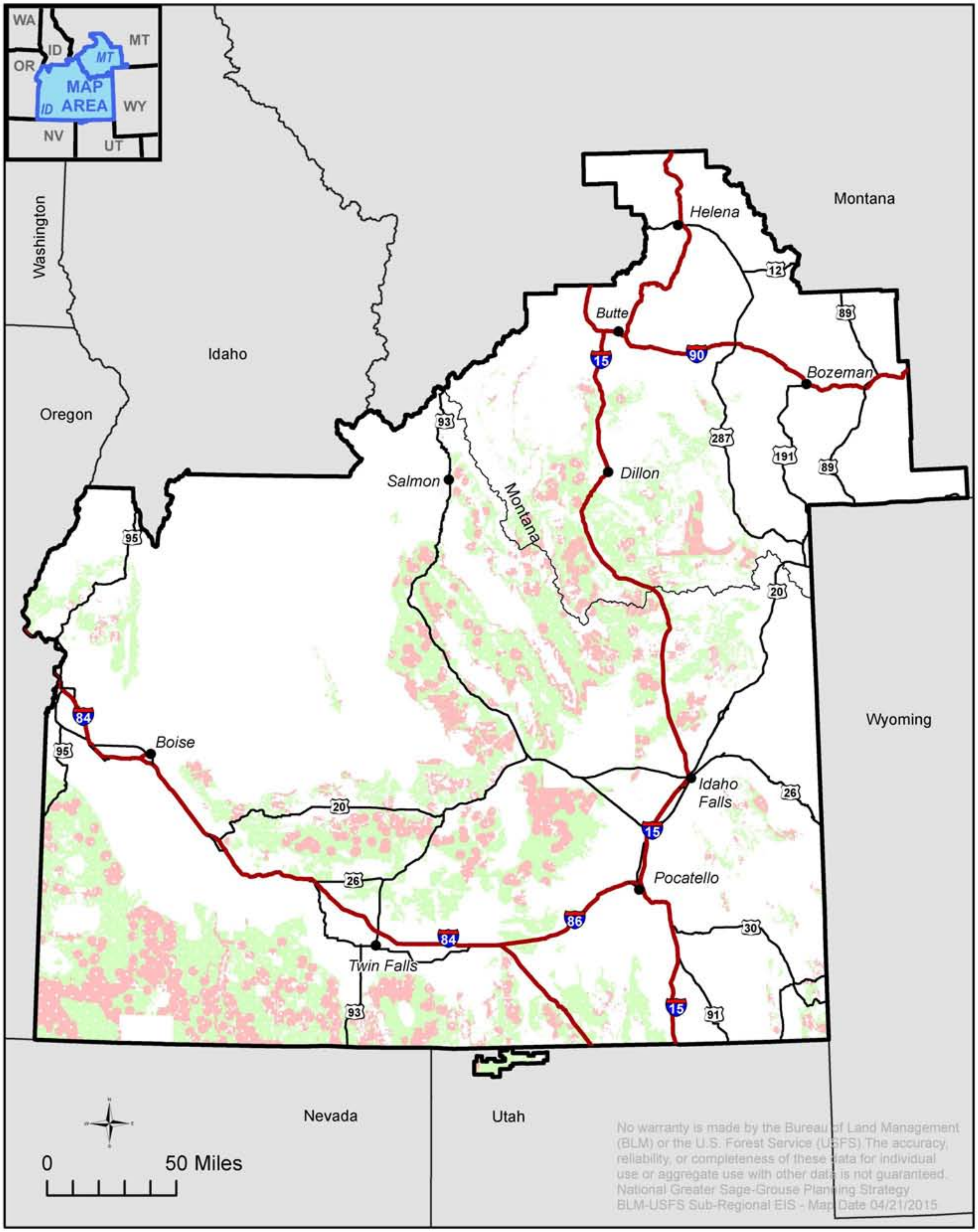


Constraint

Closed to Saleable (Mineral Material Disposal)

Idaho and SW Montana Sub-regional boundary

Figure 2-80
Alternative D: Saleable (Mineral Materials) Allocations



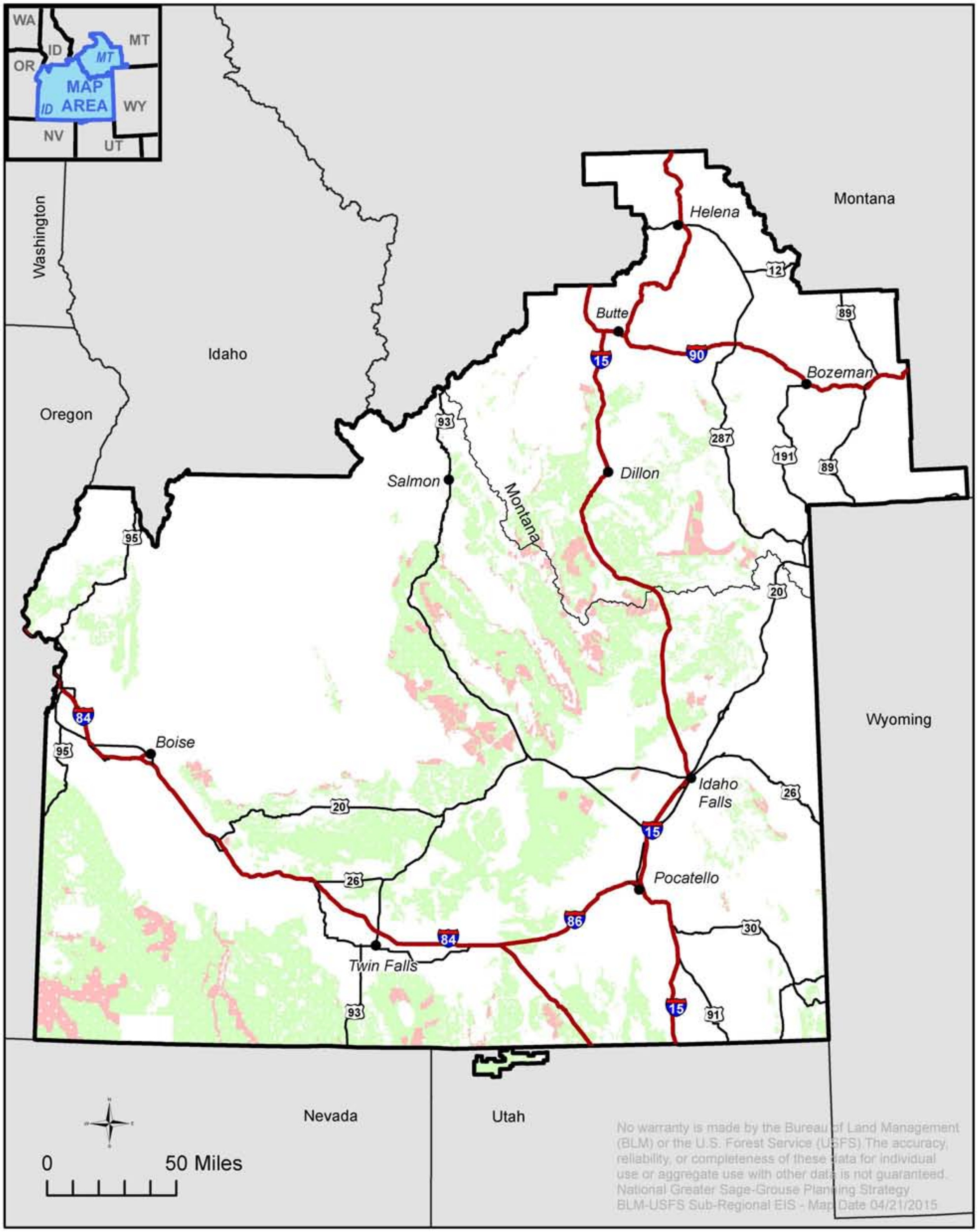
Constraint

Closed to Saleable (Mineral Material Disposal)

Open

Idaho and SW Montana Sub-regional boundary

Figure 2-81
Alternative E: Saleable (Mineral Materials) Allocations



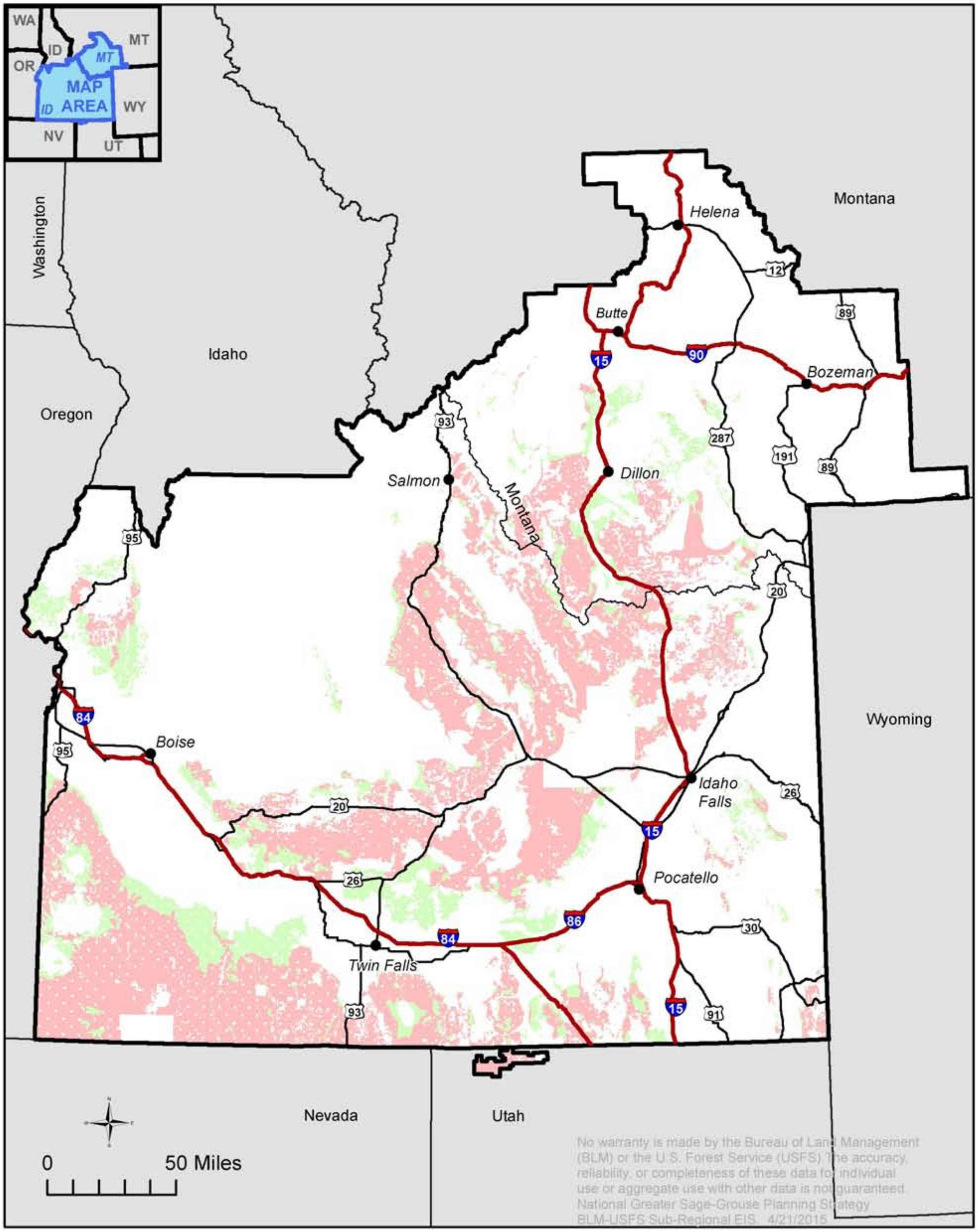
Constraint

Closed to Saleable (Mineral Material Disposal)

Open

Idaho and SW Montana Sub-regional boundary

Figure 2-82
Alternative F: Saleable (Mineral Materials) Allocations



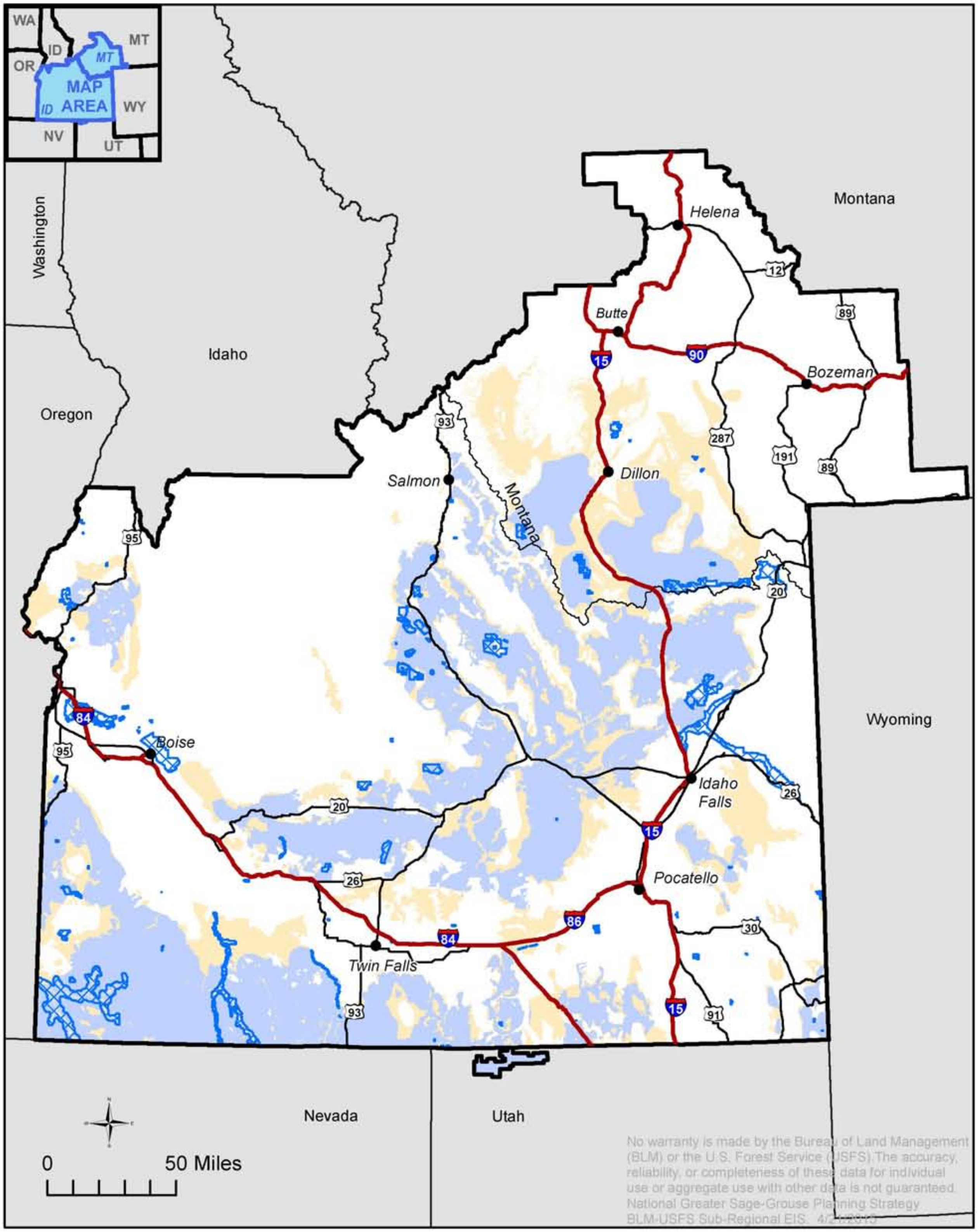
Constraint

Closed to Saleable (Mineral Material Disposal)

Open

Idaho and SW Montana Sub-regional boundary

Figure 2-83
Alternative A: BLM Areas of Critical Environmental Concern



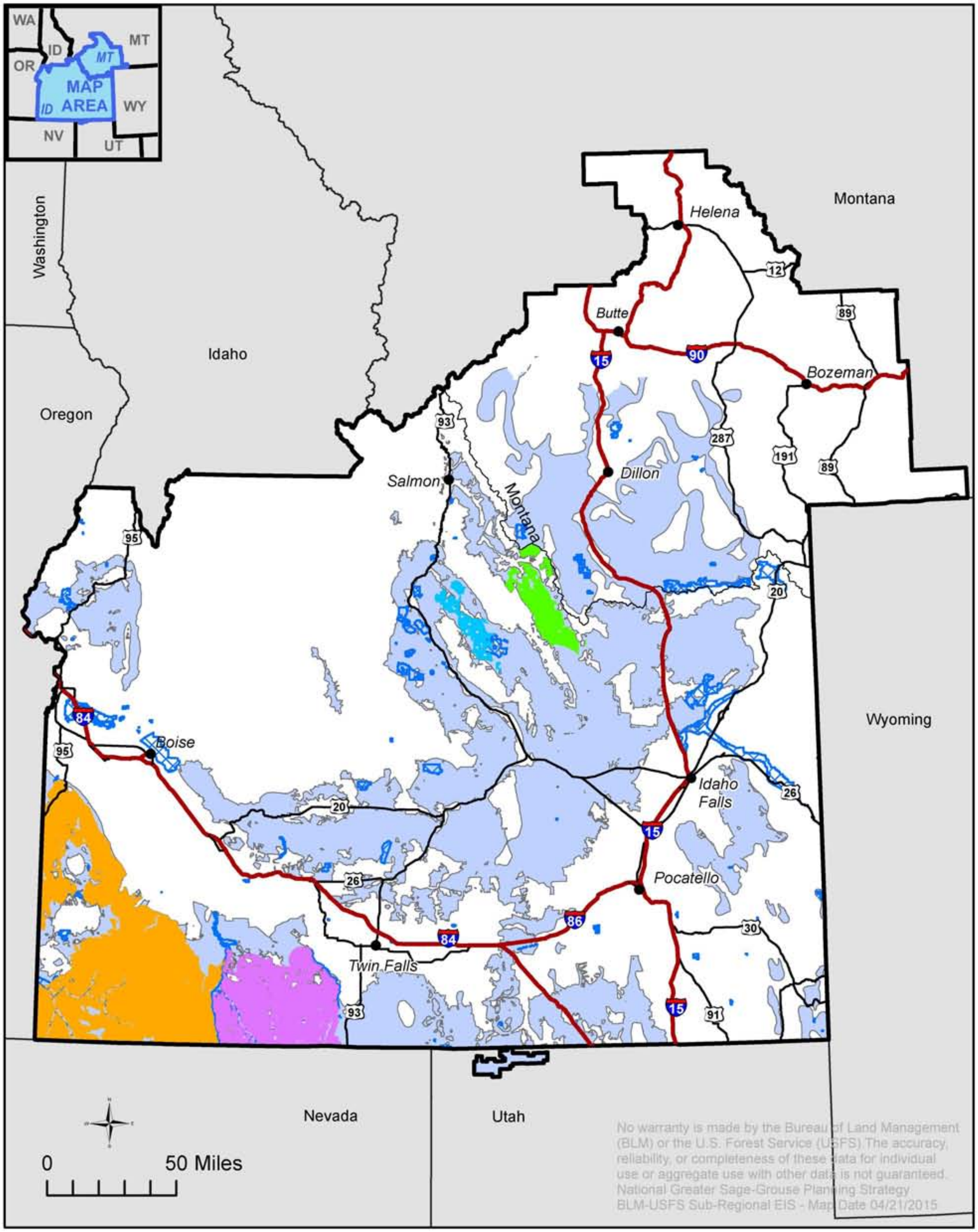
Existing ACEC

Preliminary Habitat Management Area

Priority General

Idaho and SW Montana Sub-regional boundary

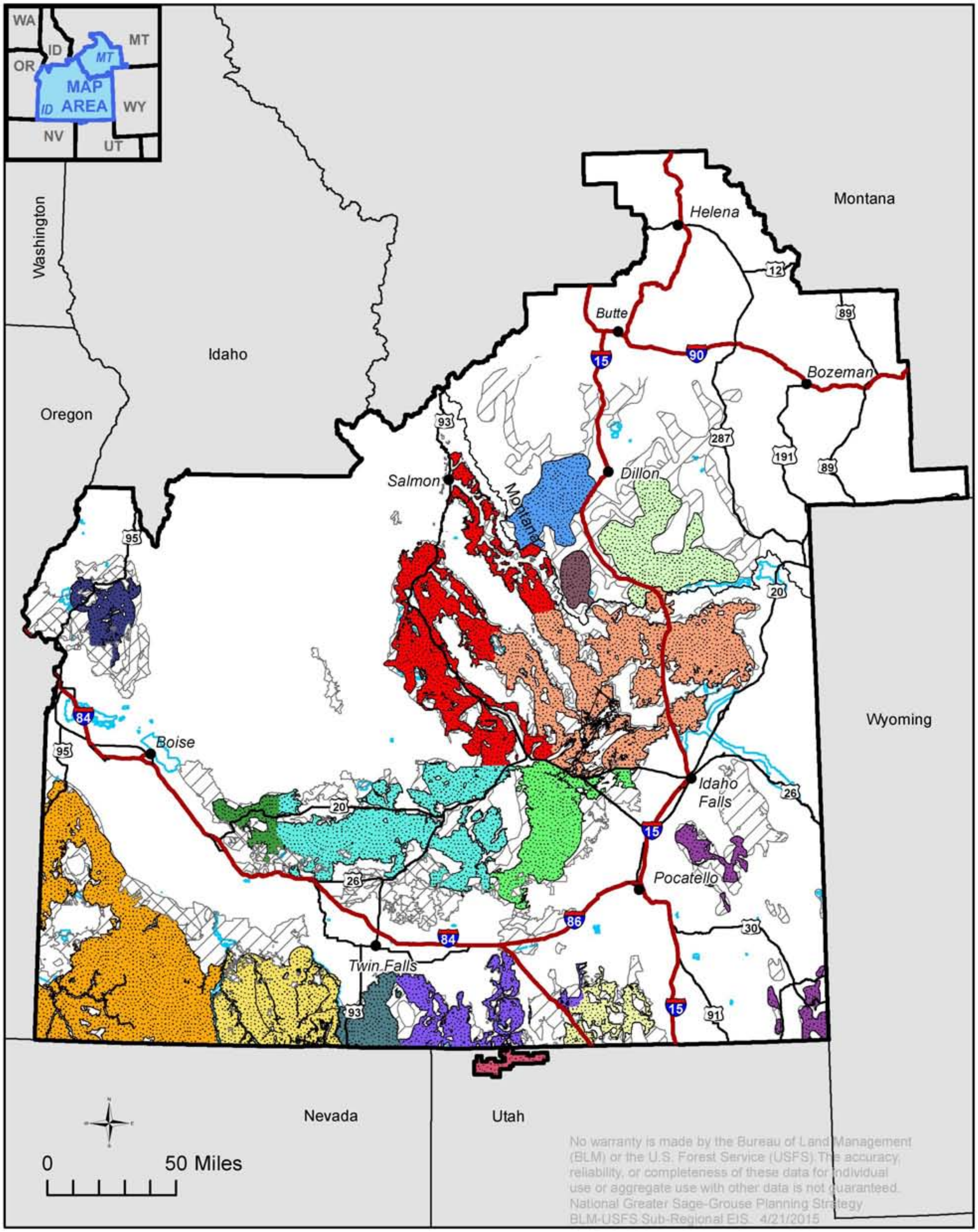
Figure 2-84
Alternative C: BLM Areas of Critical Environmental Concern



Proposed ACEC

- Canyon\Big Timber Project & Birch Creek Watershed
- Pahsimeroi
- ID-OR Borderlands and Owyhee Front
- Sagebrush Sea
- *Idaho and SW Montana Sub-regional boundary*
- Existing ACEC
- PHMA

Figure 2-85
Alternative F1: BLM Areas of Critical Environmental Concern and US Forest Service Zoological Areas



Existing ACEC

Idaho and SW Montana Sub-regional boundary

Habitat Management Area

Priority

General

Restoration

Proposed ACEC and USFS Zoological Areas

ID-01 Owyhee

ID-02 Jarbidge

ID-03 Shoshone Basin

ID-04 South Magic Valley

ID-05 Curlew

ID-06 Mountain Home

ID-07 North Magic Valley

ID-08 Big Desert

ID-09 Upper Snake

ID-10 Challis

ID-11 West Central

ID-12 East Idaho Uplands

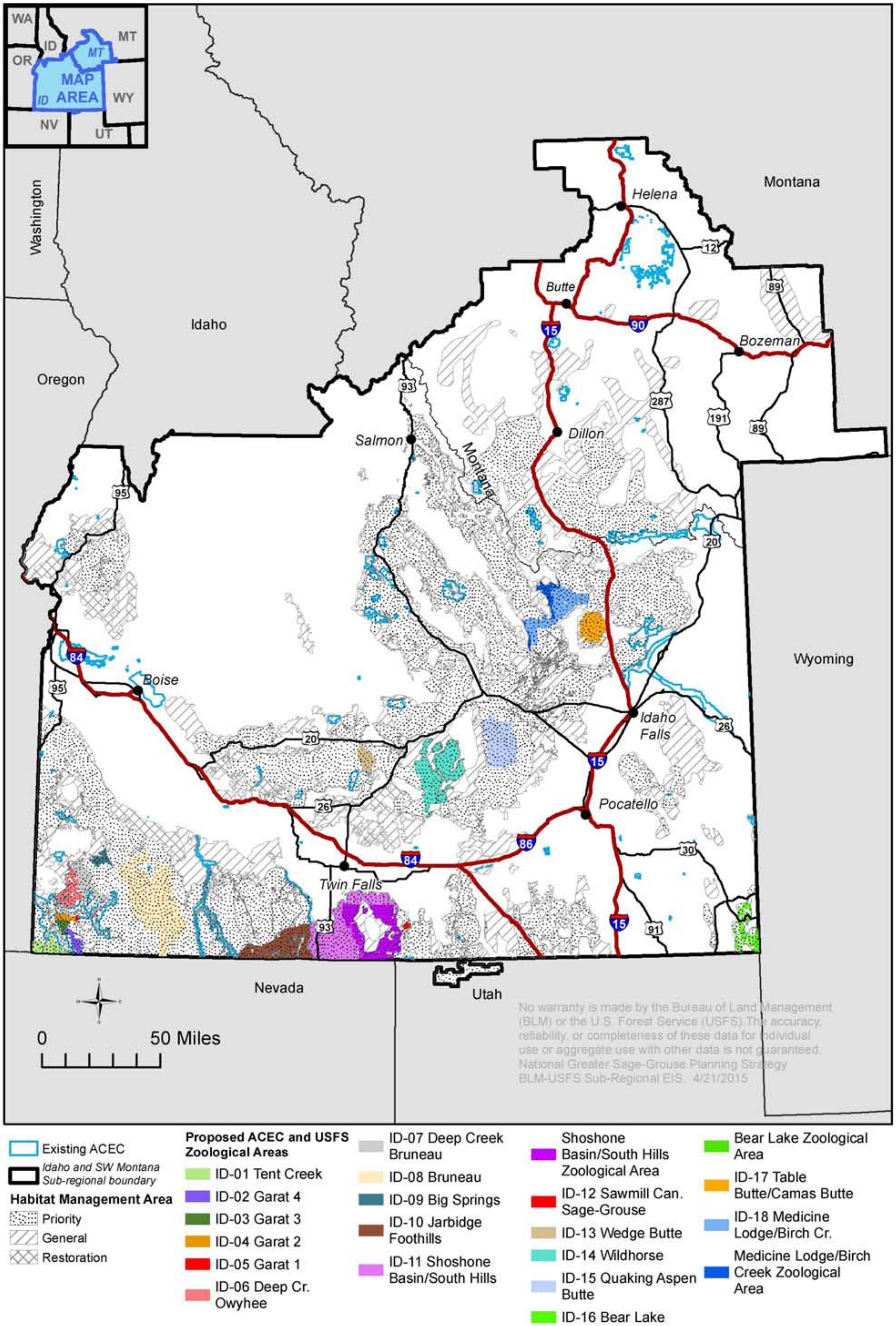
MT-01 Clark Canyon

MT-02 Lima

MT-03 Red Rock

UT-01 Sawtooth Zoological Area

Figure 2-86
Alternative F2: BLM Areas of Critcal Envirionmental Concern and US Forest Service Zoological Areas



Appendix B

Required Design Features (RDFs)

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B. Required Design Features

Required Design Features (RDFs) are required for certain activities in all GRSG habitat. RDFs establish the minimum specifications for certain activities to help mitigate adverse impacts. However, the applicability and overall effectiveness of each RDF cannot be fully assessed until the project level when the project location and design are known. Because of site-specific circumstances, some RDFs may not apply to some projects (e.g., a resource is not present on a given site) and/or may require slight variations (e.g., a larger or smaller protective area). RDFs are continuously improving as new science and technology become available and therefore are subject to change. All variations in RDFs would require that at least one of the following be demonstrated in the NEPA analysis associated with the project/activity:

- A specific RDF is documented to not be applicable to the site-specific conditions of the project/activity (e.g. due to site limitations or engineering considerations). Economic considerations, such as increased costs, do not necessarily require that an RDF be varied or rendered inapplicable;
- An alternative RDF is determined to provide equal or better protection for GRSG or its habitat;
- A specific RDF will provide no additional protection to GRSG or its habitat.

The following required design features (RDFs) are included for consideration and use based upon review of current science and effects analysis (circa 2014) (**Table B-1**). These may be reviewed during project evaluation and updated through plan maintenance as new information and updated scientific findings become available.

The table is organized by program area grouping the RDFs most relevant to that program. All relevant RDFs, regardless of which program they are grouped under, should be considered during project evaluation and applicable RDFs should be applied during implementation. The following measures would be applied as RDFs for all solid minerals. They would also apply to locatable minerals consistent with applicable law. In some cases the RDFs may not all be appropriate based on local conditions and would be assessed in the appropriate site specific NEPA analysis, these all should be considered and where determined to be beneficial to achieving GRSG habitat objectives included as part of the site specific project. In other cases additional project design criteria or best management practices could be incorporated into project implementation to address site specific concerns not fully addressed by the RDFs described here.

Table B-1
Required Design Features

Required Design Feature
General
1. Solicit and consider expertise and ideas from local landowners, working groups, and other federal, state, county, and private organizations during development of projects.
2. No repeated or sustained behavioral disturbance (e.g., visual, noise over 10 dbA at lek, etc.) to lekking birds from 6:00 pm to 9:00 am within 2 miles (3.2 km) of leks during the lekking season.
3. Avoid mechanized anthropogenic disturbance, in nesting habitat during the nesting season when implementing: 1) fuels/vegetation/habitat restoration management projects, 2) infrastructure construction or maintenance, 3) geophysical exploration activities; 4) organized motorized recreational events.
4. Avoid mechanized anthropogenic disturbance during the winter, in wintering areas when implementing: 1) fuels/vegetation/habitat restoration management projects, 2) infrastructure construction or maintenance, 3) geophysical exploration activities; 4) organized motorized recreational events.
Wildfire Suppression
5. Compile district-level information into state-wide sage-grouse tool boxes. Tool boxes will contain maps, listing of resource advisors, contact information, local guidance, and other relevant information for each district, which will be aggregated into a state-wide document.
6. Provide localized maps to dispatch offices and extended attack incident commanders for use in prioritizing wildfire suppression resources and designing suppression tactics. The Fire Planning and Fuels Management Division (FA-600) hosts a webpage containing up-to-date maps, instruction memoranda, conservation measures, BMPs, and spatial data specific to fire operations and fuels management/sage-grouse interactions. These resources can be accessed at: http://web.blm.gov/internal/fire/fpfm/sg/index.html . Additional BLM sage-grouse information can be found at: http://www.blm.gov/wo/st/en/prog/more/fish__wildlife_and/sage-grouse-conservation.html .
7. Assign a resource advisor with sage-grouse expertise, or who has access to sage-grouse expertise, to all extended attack fires in or near sage-grouse habitat areas. Prior to the fire season, provide training to sage-grouse resource advisors on wildfire suppression organization, objectives, tactics, and procedures to develop a cadre of qualified individuals. Involve state wildlife agency expertise in fire operations through: • instructing resource advisors during preseason trainings; • qualification as resource advisors; • coordination with resource advisors during fire incidents; • contributing to incident planning with information such as habitat features or other key data useful in fire decision making

Table B-1
Required Design Features

Required Design Feature	
8.	At the onset of an emerging wildland fire the Agency Administrators and Fire Management Officers will an engage a local Resource Advisor to assess sage-grouse habitat that may be affected by the fire or suppression activities.
9.	If complexity of the wildland fire warrants the activation of an Incident Management Team, locally refined information regarding important sage-grouse habitat will be relayed during in brief and continually throughout the incident.
10.	On critical fire weather days, pre-position additional fire suppression resources to optimize a quick and efficient response in sage-grouse habitat areas.
11.	As appropriate, utilize existing fuel breaks, such as roads or discrete changes in fuel type, as control lines in order to minimize fire spread.
12.	During periods of multiple fires, ensure line officers are involved in setting priorities.
13.	To the extent possible, locate wildfire suppression facilities (i.e., base camps, spike camps, drop points, staging areas, heli-bases, etc.) in areas where physical disturbance to sage-grouse habitat can be minimized. These include disturbed areas, grasslands, near roads/trails or in other areas where there is existing disturbance or minimal sagebrush cover.
14.	Power-wash all firefighting vehicles, to the extent possible, including engines, water tenders, personnel vehicles, and all-terrain vehicles (ATV) prior to deploying in or near sage-grouse habitat areas to minimize noxious weed spread.
15.	Minimize cross-country vehicle travel during fire operations in sage-grouse habitat.
16.	Minimize burnout operations in key sage-grouse habitat areas by constructing direct fireline whenever safe and practical to do so.
17.	Utilize retardant, mechanized equipment, and other available resources to minimize burned acreage during initial attack.
18.	As safety allows, conduct mop-up where the black adjoins unburned islands, dog legs, or other habitat features to minimize sagebrush loss.
19.	Adequately document fire operation activities in sage-grouse habitat for potential follow-up coordination activities.
Fuels Management Unless otherwise specified as part of the land use plan consider the full array of fuels management treatment types (prescribed fire, mechanical, chemical and biological) when implementing the following RDFs.	
20.	Where applicable, design fuels treatment objectives to protect existing sagebrush ecosystems, modify fire behavior, restore native plants, and create landscape patterns which most benefit sage-grouse habitat.
21.	Provide training to fuels treatment personnel on sage-grouse biology, habitat requirements, and identification of areas utilized locally.

Table B-1
Required Design Features

Required Design Feature
22. Use burning prescriptions which minimize undesirable effects on vegetation or soils (e.g., minimize mortality of desirable perennial plant species and reduce risk of annual grass invasion).
23. Ensure proposed sagebrush treatments are planned with full interdisciplinary input pursuant to NEPA and coordination with state fish and wildlife agencies, and that treatment acreage is conservative in the context of surrounding sage-grouse seasonal habitats and landscape.
24. Where appropriate, ensure that treatments are configured in a manner that promotes use by sage-grouse.
25. Where applicable, incorporate roads and natural fuel breaks into fuel break design.
26. Power-wash all vehicles and equipment involved in fuels management activities, prior to entering the area, to minimize the introduction of undesirable and/or invasive plant species.
27. Design vegetation treatments in areas of high fire frequency which facilitate firefighter safety, reduce the potential acres burned, and reduce the fire risk to sage-grouse habitat. Additionally, develop maps for sage-grouse habitat which spatially display existing fuels treatments that can be used to assist suppression activities.
28. As funding and logistics permit, restore annual grasslands to a species composition characterized by perennial grasses, forbs, and shrubs or one of that referenced in land use planning documentation.
29. Emphasize the use of native plant species, especially those from a warmer area of the species' current range, recognizing that non-native species may be necessary depending on the availability of native seed and prevailing site conditions.
30. Remove standing and encroaching trees within at least 110 yards of occupied sage-grouse leks and other habitats (e.g., nesting, wintering and brood rearing) to reduce the availability of perch sites for avian predators, as resources permit.
31. Protect wildland areas from wildfire originating on private lands, infrastructure corridors, and recreational areas.
32. Reduce the risk of vehicle- or human-caused wildfires and the spread of invasive species by installing fuel breaks and/or planting perennial vegetation (e.g., green-strips) paralleling road rights-of-way.
33. Strategically place and maintain pre-treated strips/areas (e.g., mowing, herbicide application, etc.) to aid in controlling wildfire, should wildfire occur near PHMA or priority restoration areas (such as where investments in restoration have already been made).

Table B-1
Required Design Features

Required Design Feature
34. Design treatments to provide a break in fuel continuity in large, at-risk, expanses of continuous sagebrush. Use local knowledge of fire occurrence, spread patterns, and habitat values at risk to determine the proper placement and size of the fuel break.
35. Use existing agreements with local, county, and state road departments to improve and maintain existing fuel breaks during routine road maintenance. Examples include: blading, mowing, disking, grading, and spraying roadside vegetation.
36. Form partnerships with linear right-of-way holders to maintain fuel breaks, which reduce fuel continuity and serve to protect at-risk landscapes.
37. Use existing NEPA documentation and authorities, where possible, when conducting road right-of-way maintenance. In many instances, existing authorizations for roads or linear rights-of-way contain provisions for maintenance activities that could be implemented and incorporated into a vegetation and habitat protection strategy without requiring additional NEPA analysis. Document this with a Determination of NEPA Adequacy (DNA).
38. Enter into agreements with road departments which may help fund the construction and maintenance of fuel breaks adjacent to roads, as funding permits.
39. Spatially depict the locations of existing and planned fuel breaks in a landscape fuel break map and label each vegetation polygon for reference. Offices will make these maps available to suppression resources for use in fire operations.
Vegetation Treatment
40. Utilize available plant species based on their adaptation to the site when developing seed mixes. (Lambert 2005; VegSpec).
41. Utilizing the warmer component of a species' current range when selecting native species for restoration when available (Kramer and Havens 2009).
42. Reduce annual grass densities and competition through herbicide, targeted grazing, tillage, prescribed fire, etc. (Pyke 2011).
43. Reduce density and competition of introduced perennial grasses using appropriate techniques to accomplish this reduction (Pellant and Lysne 2005).
44. Utilize techniques to introduce desired species to the site such as drill seeding, broadcast seeding followed by a seed coverage technique, such as harrowing, chaining or livestock trampling, and transplanting container or bare-root seedlings.
45. Assess existing on-site vegetation to ascertain if enough desirable perennial vegetation exists to consider techniques to increase on-site seed production to facilitate an increase in density of desired species.
46. Use site preparation techniques that retain existing desirable vegetation.
47. Use "mother plant" techniques or planting of satellite populations of desirable plants to serve as seed sources.
48. Utilize post-treatment control of annual grass and other invasive species.

Table B-1
Required Design Features

Required Design Feature	
49.	Utilize new tools and use of new science and research as it becomes available.
50.	Give higher priority to vegetation rehabilitation or manipulation projects that include: • Sites where environmental variables contribute to improved chances for project success (Meinke et al. 2009). • Areas where seasonal habitat is limiting GRSG distribution and/or abundance (wintering areas, wet meadows and riparian areas, nesting areas, leks, etc.). • Re-establish sagebrush cover in otherwise suitable GRSG with consideration to local needs and conditions using the general priorities in the following order: • Recently burned native areas • Native grassland with suitable forb component • Nonnative grassland with suitable forb component • Recently converted annual grass areas • Native grassland • Nonnative grassland • Where desirable perennial bunchgrasses and/or forbs are deficient in existing sagebrush stands, use appropriate mechanical, aerial or other techniques to re-establish them. Examples include but are not limited to, use of a Lawson aerator with seeding, harrow or chain with seeding, drill seeding, hand planting plugs, aerial seeding or other appropriate technique. • Cooperative efforts that may improve GRSG habitat quality over multiple ownerships. • Projects that may provide connectivity between suitable habitats or expand existing good quality habitats. • Projects that address conifer encroachment into important GRSG habitats. In general the priority for treatment is 1) Phase 1 (≤10% conifer cover), 2) Phase 2 (10-30%), and 3) Phase 3 (>30%). • Replacing stands of annual grasses within otherwise good quality habitats with desirable perennial species. Other factors that contribute to the importance of the restoration project in maintaining or improving GRSG habitat.
51.	When conducting vegetation treatments in areas inhabited or potentially inhabited by slickspot peppergrass (*Lepidium papilliferum*) follow the conservation measures in the applicable conservation agreement between Idaho BLM and US Fish and Wildlife Service (most recent version dated September 2014).
Lands and Realty	
52.	Where technically and financially feasible, bury distribution powerlines and communication lines within existing disturbance.
53.	Above-ground disturbance areas would be seeded with perennial vegetation as per vegetation management.
54.	Place infrastructure in already disturbed locations where the habitat has not been fully restored.

Table B-1
Required Design Features

Required Design Feature
55. Cluster disturbances, operations (fracturing stimulation, liquids gathering, etc.) and facilities as close as possible.
56. Co-locate linear facilities within one mile of existing linear facilities.
57. Micro-site linear facilities to reduce impacts to sage-grouse habitats.
58. Locate staging areas outside the Priority Habitat Management Areas to the extent possible.
59. Consider colocating powerlines, flowlines and pipelines under or immediately adjacent to a road or adjacent to other pipelines first, before considering co-locating with other ROW.
60. Restrict the construction of tall facilities and fences to the minimum number and amount needed.
61. Use free standing structures where possible, to limit the use of guy wires. Where guy wires are necessary and appropriate bird collision diverters would be used, if doing so would not cause a human safety risk.
62. Place new utility developments (power lines, pipelines, etc.) and transportation routes in existing utility or transportation corridors.
63. Construction and development activities should conform to seasonal restrictions.
Fluid Mineral Leasing
64. Use directional drilling and/or multi well-pads to reduce surface disturbance.
65. Apply a phased development approach with concurrent reclamation.
66. Place liquid gathering facilities outside of PHMAs. Have no tanks at well locations within PHMAs to minimize truck traffic and perching and nesting sites for ravens and raptors.
67. Use remote monitoring techniques for production facilities and develop a plan to reduce the frequency of vehicle use (Lyon and Anderson 2003).
68. Site and/or minimize linear ROWs or SUAs to reduce disturbance to sagebrush habitats.
69. Design or site permanent structures which create movement (e.g. pump jack) to minimize impacts to GRSG.
70. Equip tanks and other above-ground facilities with structures or devices that discourage nesting of raptors and corvids.
71. Control the spread and effects of non-native plant species (Gelbard and Belnap 2003, Bergquist et al. 2007, Evangelista et al. 2011). (E.g. by washing vehicles and equipment.)
72. Restrict pit and impoundment construction to reduce or eliminate threats from West Nile virus (Doherty 2007).

Table B-1
Required Design Features

Required Design Feature	
73.	Remove or re-inject produced water to reduce habitat for mosquitoes that vector West Nile virus. If surface disposal of produced water continues, use the following steps for reservoir design to limit favorable mosquito habitat: • Overbuild size of ponds for muddy and non-vegetated shorelines. • Build steep shorelines to decrease vegetation and increase wave actions. • Avoid flooding terrestrial vegetation in flat terrain or low lying areas. • Construct dams or impoundments that restrict down slope seepage or overflow. • Line the channel where discharge water flows into the pond with crushed rock. • Construct spillway with steep sides and line it with crushed rock. • Treat waters with larvicides to reduce mosquito production where water occurs on the surface
74.	Require noise shields when drilling during the lek, nesting, brood-rearing, or wintering season.
75.	The BLM/Forest Service would work with proponents to limit project related noise where it would be expected to reduce functionality of habitats in Priority and Important Habitat Management Areas.
76.	The BLM/Forest Service would evaluate the potential for limitation of new noise sources on a case-by-case basis as appropriate.
77.	Limit noise sources that would be expected to negatively impact populations in Priority and Important Habitat Management Areas and continue to support the establishment of ambient baseline noise levels for occupied leks in Priority Habitat Management Areas.
78.	As additional research and information emerges, specific new limitations appropriate to the type of projects being considered would be evaluated and appropriate limitations would be implemented where necessary to minimize potential for noise impacts on sage-grouse core population behavioral cycles.
79.	As new research is completed, new specific limitations would be coordinated with the IDFG and MT FWP and partners.
80.	Fit transmission towers with anti-perch devices (Lammers and Collopy 2007).
81.	Require sage-grouse-safe fences.
82.	Locate new compressor stations outside Priority Habitat Management Areas and design them to reduce noise that may be directed towards Priority Habitat Management Areas.
83.	Clean up refuse (Bui et al. 2011).
84.	Locate man camps outside of priority sage-grouse habitats.

Table B-1
Required Design Features

Required Design Feature
85. Consider using oak (or other material) mats for drilling activities to reduce vegetation disturbance and for roads between closely spaced wells to reduce soil compaction and maintain soil structure to increase likelihood of vegetation reestablishment following drilling.
86. Use only closed-loop systems for drilling operations and no reserve pits.
87. Cover (e.g., fine mesh netting or use other effective techniques) all drilling and production pits and tanks regardless of size to reduce sage-grouse mortality.
Roads
88. Utilize existing roads, or realignments of existing routes to the extent possible.
89. Design roads to an appropriate standard no higher than necessary to accommodate their intended purpose.
90. Do not issue ROWs or SUAs to counties on newly constructed energy or mineral development roads, unless for a temporary use consistent with all other terms and conditions included in this document.
91. Establish speed limits on BLM and FS system roads to reduce vehicle/wildlife collisions or design roads to be driven at slower speeds.
92. Coordinate road construction and use among ROW or SUA holders.
93. Construct road crossings at right angles to ephemeral drainages and stream crossings.
94. Use dust abatement on roads and pads.
95. Close and reclaim duplicate roads by restoring original landform and establishing desired vegetation.
Roads Specific to Priority and Important Habitat Management Areas
96. Locate roads to avoid priority areas and habitats as described in the Wildfire and Invasive Species Assessments.
97. Establish trip restrictions (Lyon and Anderson 2003) or minimization through use of telemetry and remote well control (e.g., Supervisory Control and Data Acquisition).
98. Restrict vehicle traffic to only authorized users on newly constructed routes (using signage, gates, etc.)
Reclamation Activities
99. Include objectives for ensuring habitat restoration to meet sage-grouse habitat needs in reclamation practices/sites (Pyke 2011).
100. Address post reclamation management in reclamation plan such that goals and objectives are to protect and improve sage-grouse habitat needs.
101. Maximize the area of interim reclamation on long-term access roads and well pads, including reshaping, topsoiling and revegetating cut-and-fill slopes.

Table B-1
Required Design Features

Required Design Feature
102. Restore disturbed areas at final reclamation to the pre-disturbance landforms and desired plant community.
103. Irrigate interim reclamation if necessary for establishing seedlings more quickly.
104. Utilize mulching techniques to expedite reclamation and to protect soils.
Grazing
105. Avoid building new wire fences within 2 km of occupied leks (Stevens 2011). If this is not feasible, ensure that high risk segments are marked with collision diverter devices or as latest science indicates.
106. Place new, taller structures, including corrals, loading facilities, water storage tanks, windmills, out of line of sight or at least one kilometer (preferably 3 km) from occupied leks, where such structures would increase the risk of avian predation.
107. Utilize temporary fencing (e.g., ESR, drop down fencing) where feasible and appropriate to meet management objectives.
108. Fence wetlands (e.g., springs, seeps, wet meadows and/or riparian areas) where appropriate, to maintain or foster progress toward Proper Functioning Condition and to facilitate management of sage-grouse habitat objectives. Where constructing fences or exclosures to improve riparian and/or upland management, incorporate fence marking or other BMPs/RDFs as appropriate.
109. During lekking periods, as determined locally (approximately March 15-May 1 in lower elevations and March 25-May 15 in higher elevations), livestock trailing will be avoided to the extent possible within 1 km (0.62 mile) of occupied leks between 6:00 p.m. and 9:00 a.m. to avoid disturbance to lekking and roosting sage-grouse. Over-nighting, watering and sheep bedding locations on public lands must be at least 1 km from occupied leks during the lekking season to reduce disturbance from sheep, human activity and guard animals.
110. Work with permittees in locating sheep over-nighting, watering and sheep bedding locations to minimize impacts to sage-grouse seasonal habitats.
111. When trailing livestock during the lekking or nesting season, use roads or existing trails, to the extent possible to reduce disturbance to roosting, lekking or nesting sage-grouse.
112. Design new spring developments in GRSG habitat to maintain or enhance the free flowing characteristics of springs and wet meadows. Modify developed springs, seeps and associated pipelines to maintain the continuity of the predevelopment riparian area within priority GRSG habitat where necessary.
113. Install ramps in new and existing livestock troughs and open water storage tanks to facilitate the use of and escape from troughs by GRSG and other wildlife.

Table B-1
Required Design Features

Required Design Feature
West Nile Virus
114. Construct water return features and maintain functioning float valves to prohibit water from being spilled on the ground surrounding the trough and/or tank and return water to the original water source, to the extent practicable.
115. Minimize the construction of new ponds or reservoirs except as needed to meet important resource management and/or restoration objectives.
116. Develop and maintain non-pond/reservoir watering facilities, such as troughs and bottomless tanks, to provide livestock water.
117. For most spring developments or wells, mosquito breeding habitat usually is not an issue. Flowing cold (less than 50° Fahrenheit) water and steep sides of the stock tanks are not conducive for egg laying or larvae production. If flows are low, the water is warm, or moss production is an issue in the tank, mosquito breeding habitat could exist in the tank.
118. Maintenance of healthy wetlands at spring sources helps control mosquitoes and their larvae by providing habitat for natural predators such as birds, dragonflies and amphibians. Protecting the wetland at the spring source with a fence is an option to consider.
119. Clean and drain stock tanks before the season starts. If never cleaned or drained, many tanks will fill with silt or debris causing warmer water and heavy vegetation growth conducive to mosquito reproduction.
120. Draining tanks after the period of use is completed, particularly in warmer weather, also reduces potential habitat by eliminating stagnant standing water.
121. Maintain a properly functioning overflow to prevent water from flowing onto the pad and surrounding area, to eliminate or minimize pooling of water that is attractive to breeding mosquitoes.
122. Clean or deepen overflow ponds to maintain colder temperatures to reduce mosquito habitat.
123. Install and maintain float valves on stock tank fill pipes to minimize overflow
124. Harden stock tank pads to reduce tracks that can potentially hold water where mosquitoes may breed.
125. Build ponds with steep shorelines to reduce shallow water (>60 cm) and aquatic vegetation around the perimeter of impoundments to deter colonizing by mosquitos (Knight et al. 2003, cited in NTT report page 61).
126. Consider removing and controlling trees and shrubs to reduce shade and wind barriers on pit and reservoir shorelines if not needed for wildlife, fish, or recreational values.
127. Impoundments that remain accessible to livestock and wildlife can cause tracking and nutrient enrichment from manure which can create favorable mosquito breeding habitat. Where this is a concern, it may be desirable to fence the reservoir and pipe the water to a tank.

Table B-1
Required Design Features

Required Design Feature
128. Construct dams or impoundments that minimize down-slope seepage or overflow. Seepage and overflow results in down-grade accumulation of vegetated shallow water areas that support breeding mosquitoes.
129. On ponds and reservoirs with enough depth and volume, introduce native fish species, which feed on mosquito larvae.
130. Line the overflow of a dam's spillway with crushed rock and constructing the spillway with steep sides to preclude the accumulation of shallow water and vegetation to reduce mosquito habitat.
131. Where an existing reservoir has filled with silt, consider cleaning to reduce shallow water habitat conducive to mosquito reproduction.
132. During confirmed West Nile virus outbreaks in sage-grouse habitat, consider larvicide applications.
Travel Management
133. Designate or design routes to direct use away from priority areas identified in Wildfire and Invasive Species Assessments and still provide for high-quality and sustainable travel routes and administrative access, legislatively mandated requirements, and commercial needs
Recreation
134. Direct use away from GRSG priority areas as described in the Wildfire and Invasive Species Assessments.
135. Eliminate or minimize external food sources for corvids.
136. Avoid development of new campgrounds or recreation facilities in nesting habitat.

Appendix G

Anthropogenic Disturbance And Adaptive Management

G. Anthropogenic Disturbance and Adaptive Management

G.1 Part I – Baseline Map and Description of Development

The **biologically significant units (BSUs)** are geographical/spatial areas within Greater Sage-grouse habitat that contains relevant and important habitats which is used as the basis for comparative calculations to support evaluation of changes to habitat. The BSUs include all land ownerships for evaluation, although application of the anthropogenic disturbance cap is specific only to BLM and Forest Service lands. The BSUs are used in the evaluation of anthropogenic disturbance and in the adaptive management habitat trigger.

For the Idaho and Southwestern Montana Greater Sage-Grouse Plan Amendment EIS the biologically significant units are defined as:

> *Idaho: All of the modeled nesting[1] and delineated winter habitat, which is based on 2011 data, occurring within Priority and/or Important Habitat Management Areas within individual Conservation Areas[2]*
>
> *Montana: All of the Priority Habitat Management Area*

These BSUs form the geographic basis for the calculation of anthropogenic disturbance and in the soft and hard adaptive management habitat triggers.

While the BSUs define the geographic extent and scale of the Subregion's landscape that will be considered in evaluating anthropogenic disturbance and the adaptive management habitat triggers, how disturbance and habitat triggers are calculated differ since anthropogenic disturbance and habitat loss affect Greater Sage-grouse differently (Knick et al. 2013).

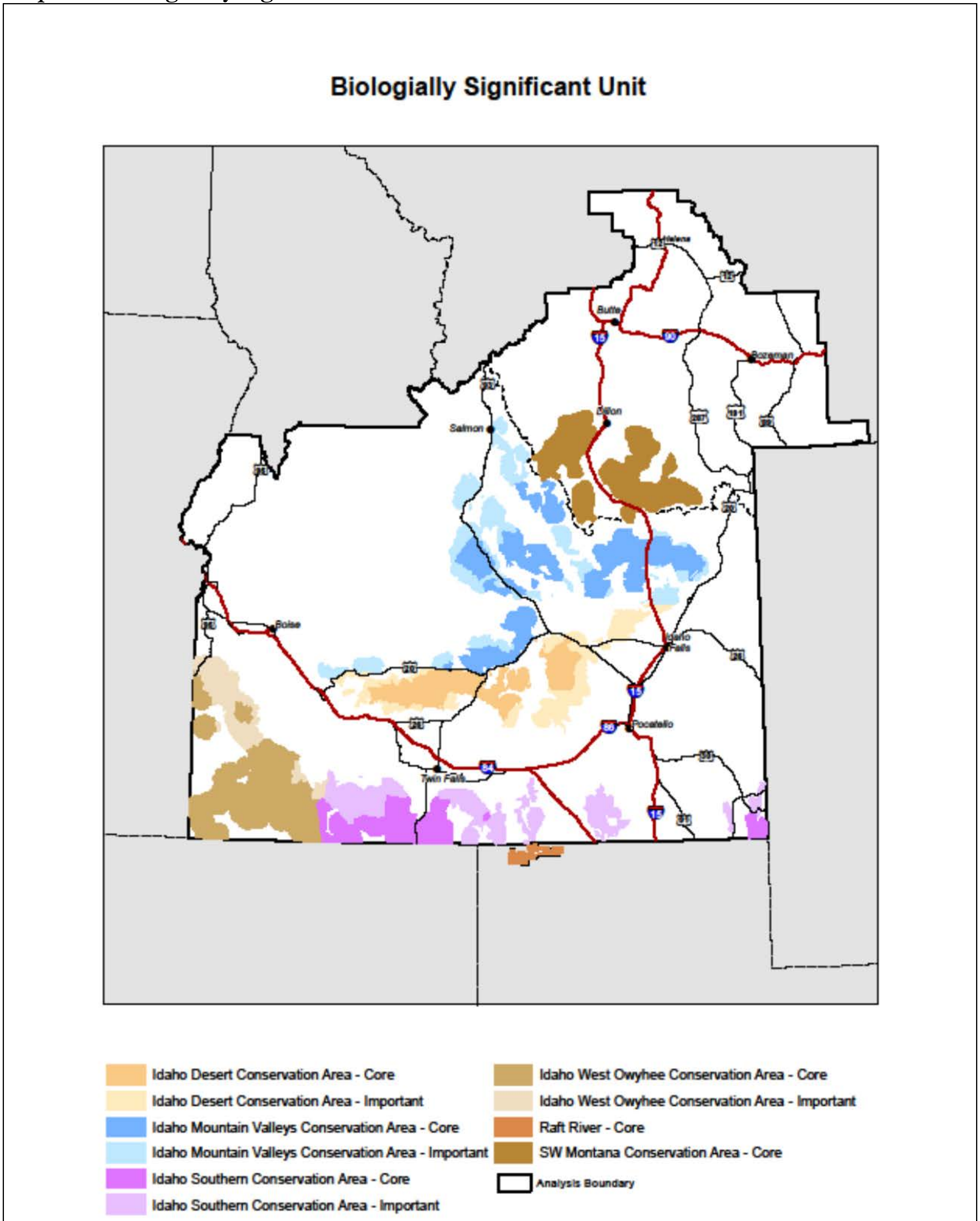
The BSU is the total area (acreage) of nesting and wintering habitat within Priority or Important Habitat Management Areas, separately, by each Conservation Area. For Idaho this results in 8 BSUs, 2 each within the Idaho Conservation Areas – 1 in Priority Habitat Management Areas and 1 in Important Habitat Management Areas. There is 1 BSU in southwest Montana and 1 BSU for the Utah portion of the Sawtooth National Forest (Raft River BSU). There are a total of 10 BSUs within the Idaho and Southwestern Montana Subregion as shown in **Map-G-1**.

In developing these BSUs it was determined at the subregional level that data from these units must be compatible with aggregation to the PAC and WAFWA Management Zone levels, in order to meet FWS needs. In addition, BSUs must be edge matched/aligned with neighboring states. All sub-regions acknowledge there may be locally important biologically significant units smaller than PACs which may or may not be rolled up to PAC level. The

[1] Modeled nesting habitat is defined as those areas of Priority or Important Habitat Management Areas within 6.2 miles of 2011 active leks.

[2] The Utah portion of the Sawtooth National Forest is calculated separately for the Southern Conservation area.

Map-G-1. Biologically Significant Unit

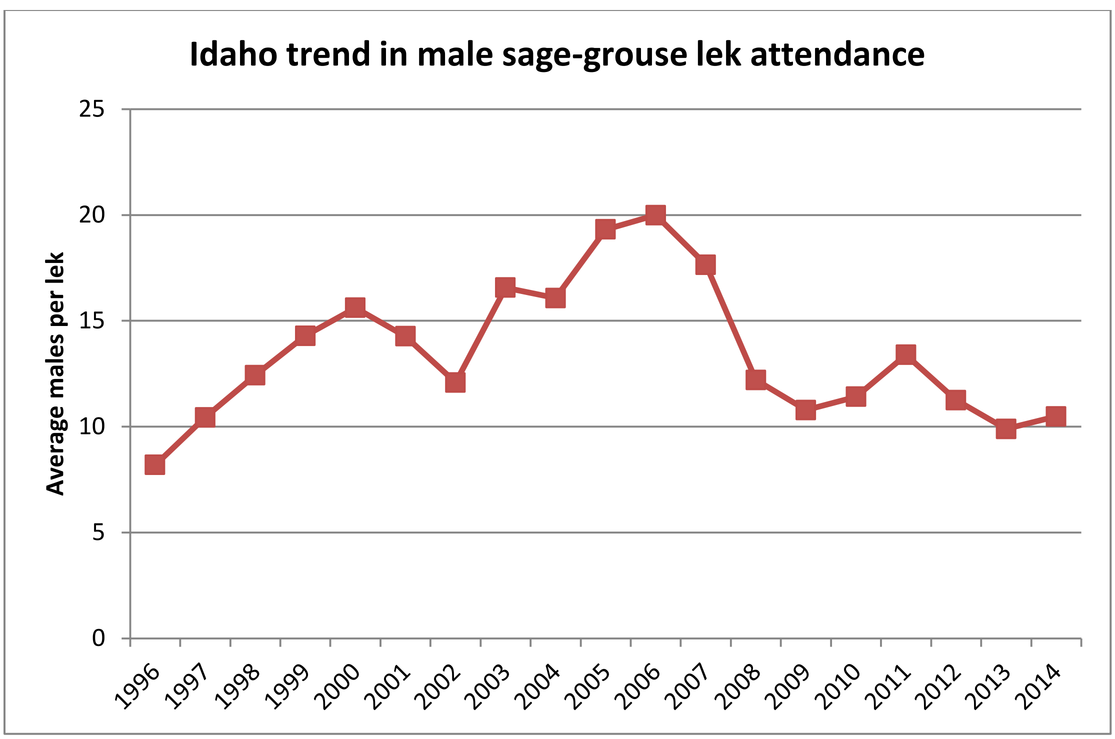


Subregions also acknowledge that assessing disturbance at larger scales such as certain PACs, or via rollup of data, provides a baseline metric for future comparison, but dilution may likely mask disturbance concerns occurring at more local scales.

The application of these calculations requires certain assumptions and associated baseline values which set an appropriate benchmark for future comparison.

For the adaptive management evaluation in Idaho the baseline year for comparison of both the population and habitat values is set at 2011. Sage-grouse have been monitored by counting males on leks since the 1950's (IDFG files). Average male lek attendance (statewide average) reached a low point in 1996 (IDFG in file). A more consistent and intensified survey of leks began with the annual monitoring of all 78 lek routes across southern Idaho in 1996. Average male lek attendance has fluctuated since 1996 (**Figure G-1**) in response to favorable or unfavorable conditions (e.g. weather, habitat improvements or loss, and West Nile virus). Peaks were in 2000, 2006, and 2011 with low points in 2002 and 2009. The increase in male lek attendance after previous declines indicates that sage-grouse populations can rebound over a relatively short time frame (e.g. 5 years) given desirable conditions. The baseline was set at 2011 because the average number of males is approximately the medium (8 higher and 7 lower years) of the counts between1996-2011. At the statewide scale, the 2011 baseline allows 10% and 20% population triggers to be above the second lowest point in 2009. Application of the trigger at a smaller (Conservation Area) scale is a more conservative approach that will indicate potential trends sooner than if applied at the state-wide scale.

Figure G-1. Idaho Trend in Male Sage-grouse Lek Attendance.



G.2 Part II – Anthropogenic Disturbance Calculation

In the USFWS's 2010 listing decision for sage-grouse, the USFWS identified 18 threats contributing to the destruction, modification, or curtailment of the sage-grouse's habitat or range (75 FR 13910 2010. The 18 threats have been aggregated into three measures:

Sagebrush Availability (percent of sagebrush per unit area)

Habitat Degradation (percent of human activity per unit area)

Density of Energy and Mining (facilities and locations per unit area)

Habitat Degradation and Density of Energy and Mining will be evaluated under the Disturbance Cap and Density Cap respectively and are further described in this appendix. The three measures, in conjunction with other information, will be considered during the NEPA process for projects authorized or undertaken by the BLM.

<u>Disturbance Cap:</u>

This land use plan has incorporated a 3% disturbance cap within Greater Sage-Grouse (GRSG) Priority Habitat Management Areas (PHMAs) and the subsequent land use planning actions if the cap is met:

For Idaho and Montana, if the 3 percent anthropogenic disturbance cap is exceeded on lands (regardless of land ownership) within GRSG PHMA (or IHMA in Idaho) Habitat Management Areas in any given BSU, then no further discrete anthropogenic disturbances (subject to applicable laws and regulations, such as the General Mining Law of 1872, as amended, valid existing rights, etc.) will be permitted by BLM within GRSG PHMAs and IHMAs in any given BSU until the disturbance has been reduced to less than the cap. As measured according to the Monitoring Framework (Appendix G) for the intermediate scale.

For Idaho, if the 3 percent disturbance cap is exceeded on all lands (regardless of land ownership) within a proposed project analysis area (Appendix G) in a PHMA (or IHMA in Idaho), then no further anthropogenic disturbance will be permitted by BLM until disturbance in the proposed project analysis area has been reduced to maintain the area under the cap (subject to applicable laws and regulations, such as the General Mining Law of 1872, as amended, valid existing rights, etc.).

For Montana, if the 3 percent disturbance cap is exceeded on lands (regardless of land ownership) or if anthropogenic disturbance and habitat loss associated with conversion to agricultural tillage or fire exceed 5% within a project analysis area in PHMAs, then no further discrete anthropogenic disturbances (subject to applicable laws and regulations, such as the 1872 Mining Law, valid existing rights, etc.) will be permitted by BLM within PHMA in a project analysis area until the disturbance has been reduced to less than the cap. If the BLM determines that the State of Montana has adopted a GRSG Habitat Conservation Program that contains comparable components to those found in the State of Wyoming's Core Area Strategy including an all lands approach for calculating anthropogenic disturbances, a clear methodology for measuring the density of operations, *and a fully operational Density Disturbance Calculation Tool, the 3% disturbance cap will be converted to a 5% cap for all sources of habitat alteration within a project analysis area.*

The disturbance cap applies to the PHMA within both the Biologically Significant Units (BSU) and at the project authorization scale. For the BSUs, west-wide habitat degradation (disturbance) data layers (**Table G-1**) will be used at a minimum to calculate the amount of disturbance and to determine if the disturbance cap has been exceeded as the land use plans (LUP) are being implemented. Locally collected disturbance data will be used to determine if the disturbance cap has been exceeded for project authorizations, and may also be used to calculate the amount of disturbance in the BSUs.

Although locatable mine sites are included in the degradation calculation, mining activities under the 1872 mining law may not be subject to the 3% disturbance cap. Details about locatable mining activities will be fully disclosed and analyzed in the NEPA process to assess impacts to sage-grouse and their habitat as well as to BLM goals and objectives, and other BLM programs and activities.

Formulas for calculations of the amount of disturbance in the PHMA in a BSU and or in a proposed project area are as follows:

- For the BSUs:

  % Degradation Disturbance = (combined acres of the 12 degradation threats[1]) ÷ (acres of all lands within the PHMAs in a BSU) x 100.

- For the Project Analysis Area:

  % Degradation Disturbance = (combined acres of the 12 degradation threats[1] plus the 7 site scale threats[2]) ÷ (acres of all lands within the PHMA in the project analysis area) x 100.

[1] see **Table G-1**. [2] see **Table G-2**

The denominator in the disturbance calculation formula consists of all acres of lands classified as PHMA within the analysis area (BSU or project area). Areas that are not sage-grouse seasonal habitats, or are not currently supporting sagebrush cover (e.g., due to wildfire), are not excluded from the acres of PHMA in the denominator of the formula. Information regarding sage-grouse seasonal habitats, sagebrush availability, and areas with the potential to support sage-grouse populations will be considered along with other local conditions that may affect sage-grouse during the analysis of the proposed project area.

<u>Density Cap:</u>

This land use plan has also incorporated a cap on the density of energy and mining facilities at an average of one facility per 640 acres in the PHMA in a project authorization area. If the disturbance density in the PHMA in a proposed project area is on average less than 1 facility per 640 acres, the analysis will proceed through the NEPA process incorporating mitigation

Table G-1
Anthropogenic disturbance types for disturbance calculations. Data sources are described for the west-wide habitat degradation estimates
(Table copied from the GRSG Monitoring Framework)

Degradation Type	Subcategory	Data Source	Direct Area of Influence	Area Source
Energy (oil & gas)	Wells	IHS; BLM (AFMSS)	5.0ac (2.0ha)	BLM WO-300
	Power Plants	Platts (power plants)	5.0ac (2.0ha)	BLM WO-300
Energy (coal)	Mines	BLM; USFS; Office of Surface Mining Reclamation and Enforcement; USGS Mineral Resources Data System	Polygon area (digitized)	Esri/ Google Imagery
	Power Plants	Platts (power plants)	Polygon area (digitized)	Esri Imagery
Energy (wind)	Wind Turbines	Federal Aviation Administration	3.0ac (1.2ha)	BLM WO-300
	Power Plants	Platts (power plants)	3.0ac (1.2ha)	BLM WO-300
Energy (solar)	Fields/Power Plants	Platts (power plants)	7.3ac (3.0ha)/MW	NREL
Energy (geothermal)	Wells	IHS	3.0ac (1.2ha)	BLM WO-300
	Power Plants	Platts (power plants)	Polygon area (digitized)	Esri Imagery
Mining	Locatable Developments	InfoMine	Polygon area (digitized)	Esri Imagery
Infrastructure (roads)	Surface Streets (Minor Roads)	Esri StreetMap Premium	40.7ft (12.4m)	USGS
	Major Roads	Esri StreetMap Premium	84.0ft (25.6m)	USGS
	Interstate Highways	Esri StreetMap Premium	240.2ft (73.2m)	USGS
Infrastructure (railroads)	Active Lines	Federal Railroad Administration	30.8ft (9.4m)	USGS
Infrastructure (power lines)	1-199kV Lines	Platts (transmission lines)	100ft (30.5m)	BLM WO-300
	200-399 kV Lines	Platts (transmission lines)	150ft (45.7m)	BLM WO-300
	400-699kV Lines	Platts (transmission lines)	200ft (61.0m)	BLM WO-300
	700+kV Lines	Platts (transmission lines)	250ft (76.2m)	BLM WO-300
Infrastructure (communication)	Towers	Federal Communications Commission	2.5ac (1.0ha)	BLM WO-300

Table G-2
The seven site scale features considered threats to sage-grouse included in the disturbance calculation for project authorizations.

1. Coalbed Methane Ponds
2. Meteorological Towers
3. Nuclear Energy Facilities
4. Airport Facilities and Infrastructure
5. Military Range Facilities & Infrastructure
6. Hydroelectric Plants
7. Recreation Areas Facilities and Infrastructure

Definitions:

1. **Coalbed Methane and other Energy-related Retention Ponds –** The footprint boundary will follow the fenceline and includes the area within the fenceline surrounding the impoundment. If the pond is not fenced, the impoundment itself is the footprint. Other infrastructure associated with the containment ponds (roads, well pads, etc.) will be captured in other disturbance categories.
2. **Meteorological Towers** – This feature includes long-term weather monitoring and temporary meteorological towers associated with short-term wind testing. The footprint boundary includes the area underneath the guy wires.
3. **Nuclear Energy Facilities** – The footprint boundary includes visible facilities (fence, road, etc.) and undisturbed areas within the facility's perimeter.
4. **Airport Facilities and Infrastructure (public and private)** –The footprint boundary of will follow the boundary of the airport or heliport and includes mowed areas, parking lots, hangers, taxiways, driveways, terminals, maintenance facilities, beacons and related features. Indicators of the boundary, such as distinct land cover changes, fences and perimeter roads, will be used to encompass the entire airport or heliport.
5. **Military Range Facilities & Infrastructure** – The footprint boundary will follow the outer edge of the disturbed areas around buildings and includes undisturbed areas within the facility's perimeter.
6. **Hydroelectric Plants** – The footprint boundary includes visible facilities (fence, road, etc.) and undisturbed areas within the facility's perimeter.
7. **Recreation Areas & Facilities –** This feature includes all sites/facilities larger than 0.25 acres in size. The footprint boundary will include any undisturbed areas within the site/facility.

measures into an alternative. If the disturbance density is greater than an average of 1 facility per 640 acres, the proposed project will either be deferred until the density of energy and mining facilities is less than the cap or co-located it into existing disturbed area (subject to applicable laws and regulations, such as the 1872 Mining Law, valid existing rights, etc.). Facilities included in the density calculation (**Table G-3**) are:

- Energy (oil and gas wells and development facilities)
- Energy (coal mines)
- Energy (wind towers)
- Energy (solar fields)
- Energy (geothermal)
- Mining (active locatable, leasable, and saleable developments)

Project Analysis Area Method for Permitting Surface Disturbance Activities:

- Determine potentially affected occupied leks by placing a four mile boundary around the proposed area of physical disturbance related to the project. All occupied leks located within the four mile project boundary and within PHMA will be considered affected by the project.
- Next, place a four mile boundary around each of the affected occupied leks.
- The PHMA within the four mile lek boundary and the four mile project boundary creates the project analysis area for each individual project. If there are no occupied leks within the four-mile project boundary, the project analysis area will be that portion of the four-mile project boundary within the PHMA.
- Digitize all existing anthropogenic disturbances identified in **Table G-1** and the 7 additional features that are considered threats to sage-grouse (**Table G-2**). Using 1 meter resolution NAIP imagery is recommended. Use existing local data if available.
- Calculate percent existing disturbance using the formula above. If existing disturbance is less than 3%, proceed to next step. If existing disturbance is greater than 3%, defer the project.
- Add proposed project disturbance footprint area and recalculate the percent disturbance. If disturbance is less than 3%, proceed to next step. If disturbance is greater than 3%, defer project.
- Calculate the disturbance density of energy and mining facilities (listed above). If the disturbance density is less than 1 facility per 640 acres, averaged across project analysis area, proceed to the NEPA analysis incorporating mitigation measures into an alternative. If the disturbance density is greater than 1 facility per 640 acres, averaged across the project analysis area, either defer the proposed project or co-locate it into existing disturbed area.

Table G-3
Relationship between the 18 threats and the three habitat disturbance measures for monitoring and disturbance calculations.

USFWS Listing Decision Threat	Sagebrush Availability	Habitat Degradation	Energy and Mining Density
Agriculture	X		
Urbanization	X		
Wildfire	X		
Conifer encroachment	X		
Treatments	X		
Invasive Species	X		
Energy (oil and gas wells and development facilities)		X	X
Energy (coal mines)		X	X
Energy (wind towers)		X	X
Energy (solar fields)		X	X
Energy (geothermal)		X	X
Mining (active locatable, leasable, and saleable developments)		X	X
Infrastructure (roads)		X	
Infrastructure (railroads)		X	
Infrastructure (power lines)		X	
Infrastructure (communication towers)		X	
Infrastructure (other vertical structures)		X	
Other developed rights-of-way		X	

- If a project that would exceed the degradation cap or density cap cannot be deferred due to valid existing rights or other existing laws and regulations, fully disclose the local and regional impacts of the proposed action in the associated NEPA.

The following data sets would ***not*** be used to calculate anthropogenic disturbance, but would be used in the habitat baseline to estimate habitat availability or the amount of sagebrush on the landscape within biologically significant units.

1. Habitat treatments
2. Wildfire
3. Invasive plants
4. Conifer encroachment
5. Agriculture
6. Urbanization, Ex-urban and rural development

Travel and Transportation Disturbance in Sage-Grouse Habitat

The following would count as disturbance (see Part V for definitions):

Linear transportation features identified as roads that have a maintenance intensity of 3 or 5

Linear transportation features identified as primitive roads, temporary routes, or administrative routes that have a functional classification and a maintenance intensity of level 3 or 5

Non-Disturbance

The following items would not count as disturbance:

Linear transportation features identified as trails.

Linear transportation features identified as primitive roads, temporary routes, or administrative routes that have a maintenance intensity of either level 0 or 1.

Linear transportation features identified as primitive routes.

Linear disturbances.

Derivation of the Disturbance Formula -

There is no definitive and scientifically proven formula to determine impact to GRSG from disturbance described in current research. However, Knick et al. (2013) did describe certain relationships between GRSG and anthropogenic disturbance that have been used, in conjunction with specific assumptions to describe a mathematical relationship between human disturbance footprint, effective GRSG habitat and effects to GRSG.

The variables in the equation are defined as:

Acres of a Biologically Significant Unit (BSU)

Acres of Anthropogenic Development within the BSU

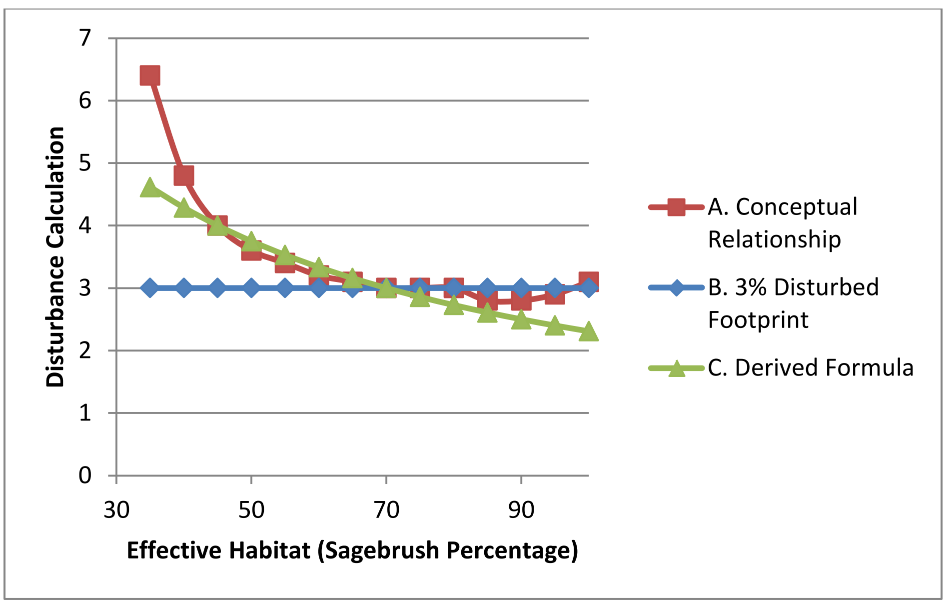
Acres of Effective GRSG Habitat (sagebrush) within the BSU

Knick et al. (2013) defined their unit of comparison (analogous to a biologically significant unit) as an area within 5 km of the lek. Within this area they also found that 79% of this area contained sagebrush (analogous to effective GRSG habitat). Results of the study show that

"Ninety-nine percent of active leks were in landscapes with <3% developed". This shows that when areas within 5 km of a lek containing 79% sagebrush were 3% developed there was a measurable effect on the presence of GRSG – this defines a disturbance threshold of 3% at which point GRSG are affected. Knick et al. developed a habitat similarity relationship between the proportion of leks and percent of sagebrush which shows the highest proportion of leks when sagebrush percentage is between 70-90% (Knick et al. 2013, Figure 5, Connelly et al. 2000, Wisdom et al. 2011). Above 90% and below 70% the proportion of leks is reduced. This helps define the optimum range for sagebrush at between 70-90% and also indicates that the disturbance threshold of 3% is also dependent upon and varies with the percent of sagebrush present (effective habitat).

These findings from Knick et al. (2013) help define some mathematical parameters to define a modeled relationship between disturbance, effective habitat and effects to GRSG. **Figure G-2** illustrates three different 'disturbance curves' that reflect the relationship between disturbance (y-axis) and effective habitat (sagebrush percentage) (x-axis) when the footprint disturbed is equivalent to 3% of the area. The red boxes (A) represent the conceptual relationship between disturbance and effective habitat as described and interpreted from Knick et al. (2013). The blue diamonds (B) represent a simple calculation based only on disturbance footprint, without regard to effective habitat. The green triangles (C) represent the derived formula to model the relationship.

Figure G-2. Disturbance Relationships



The 'A' disturbance curve shows that when the disturbance footprint is 3% of the area and the sagebrush percentage is between 70-90% the disturbance calculation would be 3. When sagebrush percent falls below 70% or rises above 90%, the change in habitat, even without a change in disturbed footprint would begin to affect the presence of GRSG. As the amount of sagebrush declines while disturbance remains the same there would be an increasing effect to GRSG presence. This disturbance curve is conceptual and Knick et al. (2013) does not explicitly define this relationship, although this relationship does reflect numerical the observations described in Knick et al. (2013).

The 'B' disturbance curve is a straight calculation based only on disturbed footprint over a specified area. It does not account for variability of sagebrush percentage, and the only variable is the acres of disturbance. For an area that is 3% disturbed the relationship 'curve' is a flat line at 3, regardless of sagebrush percentage. This 'curve' or calculation would match the conceptual curve when sagebrush percentage is between 70 and 90%. This calculation would not account for changes in effective habitat due to loss through fire or gain through restoration and rehabilitation.

The 'C' disturbance curve models and approximates the conceptual relationship described in Knick et al. (2013). It accounts for changes in effective habitat that would translate into variable effects to GRSG based on loss or gain of habitat. It includes the ability to consider habitat loss such as from fire and to consider habitat gain such as from rehabilitation efforts including conifer removal. The model matched the conceptual relationship in the range of 70% sagebrush and approximates the conceptual relationship in areas with more or less sagebrush cover. The conceptual relationship assumes a more exponential relationship to GRSG effects from loss of habitat, while the derived formula assumes a more linear relationship. There are no available scientific studies that more clearly define the nature of the relationship. The derived formula and the conceptual relationship are substantially similar from 35-90% sagebrush percentage to validate the derived formula's relative approximation of the relationship.

Development of the Modeled Formula:

In order to manage and apply a defined disturbance cap it is necessary to take the findings of the appropriate scientific research and utilize them as appropriately as possible to develop management strategies and evaluation techniques consistent with the management objective. Most scientific research is not completed with the intent to develop specific management objectives or approaches; however, it is through the management approaches that the scientific findings utilized to inform management.

Development of the modeled formula began by describing the simplest relationship of disturbance across a defined area by defining the disturbance percentage as:

$$\%\,Disturbance = \left(\frac{Footprint\ Acres\ from\ Anthropogenic\ Disturbance}{Acres\ within\ Area\ of\ Concern}\right) * 100$$

This accounts for disturbance, but does not account for changes in effective habitat or sagebrush percentage as described in Knick et al. (2013). To account for effective habitat the formula needs to include a term that adjusts the resulting calculation with regard to effective habitat. This should be reflected as an adjustment to the denominator (acres within area of concern). The denominator would be weighted based on the amount of effective habitat. In mathematical terms this would give a denominator of:

$$(Acres\ within\ Area\ of\ Concern) * (Adjustment\ Based\ on\ Effective\ Habitat)$$

The adjustment term must equal 1.0 when the effective habitat is somewhere between 70-90% as described in Knick et al. (2013). Assuming the adjustment term is related to the relative percentage of sagebrush or effective habitat then the *Adjustment Based on Effective Habitat* could be expressed as:

$$\frac{Acres\ of\ Effective\ Habitat\ within\ the\ Area\ of\ Concern}{Acres\ within\ the\ Area\ of\ Concern}$$

However, this term does not equal 1.0 when effective habitat is less than 100%. In order to meet the requirement of equaling 1.0 a constant must be added. This constant, when added to the percentage calculated in the previous term must equal 1.0 when the *Acres of Effective Habitat within the Area of Concern* is somewhere between 70-90%. In the Idaho and Southwestern Montana Subregional Plan an objective of 70% effective habitat has been defined, which is consistent with Knick et al. (2013). If the objective is 70% then the constant that must be added to this term is 0.3 in order to meet the requirement of equaling 1.0 at 70% effective habitat. This defines the following derived formula that approximates the conceptual relationship described in Knick et al. (2013).

$$Disturbance\ Percentage = \left(\frac{\text{Footprint Acres from Anthropogenic Disturbance within Area of Concern}}{\text{Acres within the Area of Concern} * \left(\frac{Acres\ of\ Effective\ Habitat\ within\ the\ Area\ of\ Concern}{Acres\ within\ the\ Area\ of\ Concern} + 0.3\right)}\right) \text{X } 100$$

Scale:

The particular scale for which this formula is calculated is defined by the Area of Concern. The Knick et al. (2013) used a study area defined by the area within 5 km of an individual lek. The disturbance relationships described previously are applicable at this scale and begin to break down or lose their integrity at greater distances from the lek (18 km). This concern, coupled with limited availability of consistent data across broader areas undermines the reliability and accuracy of the calculation when including areas more distant from the lek.

From a management perspective there is a need to address concerns at the broader scale to help manage those threats before they become a concern at the site specific scale. In Idaho, nesting location data collected by Idaho Department of Fish and Game (IDFG), shows that most nesting habitat occurs within 6.2 miles (10 km) of the lek. IDFG has also collected telemetry data on GRSG movements and used this data to help define wintering areas. Nesting and wintering areas are the most limited and seasonal habitats in Idaho and additional disturbance in those areas could have impacts to GRSG presence. For these reasons the Area of Concern, referred to as the Biologically Significant Unit have been delineated to include nesting and wintering habitats. This results in areas that include more acres than just those associated within a 5 km area of an individual lek as described by Knick et al. (2013), but that are associated (within 6.2 miles or 10 km) with leks. While the Knick et al. (2013) study did not include winter habitat, because of their relative importance they have also been included as part of the BSU since conceivably disturbances that would cause lek abandonment would also likely cause abandonment or avoidance of other seasonal habitat areas. Using other administratively defined areas not delineated or based on specific GRSG use may undermine the utility and integrity of the disturbance relationship and calculation.

This approach, built upon the findings in Knick et al. (2013), uses those findings to help inform management at a broader scale that would help determine management actions based on disturbance evaluations. Using the BSU as the Area of Concern is a scale larger than described in Knick et al. (2013), but still within the predictive bounds described in that study. The formula can be used to calculate disturbance at the BSU scale to help inform a disturbance cap, and it can also be used at the site or project scale to help inform specific project activities.

Additional Questions and Answers Regarding the Idaho Disturbance Calculation

The measurement and application of a disturbance threshold with regard to a species using the various locations of the landscape for different parts of its life history is extremely complicated. The previous discussion is a description of the derivation of that calculation and application. What follows are specific responses to questions that have arisen based on the previous discussion. While all of the following answers are supported in the previous discussion they are not necessary described as explicitly there as they are below.

Question: Why has Idaho BLM developed a calculation apart from the rest of the Great Basin planning areas when USFWS has been looking for a consistent approach to the extent possible?

Response: The alternative included in the Draft EIS's describing the National Technical Team Report (Alternative B in the Idaho and Southwestern Montana DEIS) included a management action to apply a 3% disturbance cap. However, there was no description of how this would be applied, calculated or implemented in subsequent management. The Preferred Alternatives (D & E) did not include a disturbance cap since disturbance was not identified as a major concern causing loss of habitat in Idaho or Southwestern Montana and its measurement and applicability was not defined and deemed highly problematic to implement in a meaningful way. During the early 2014 Federal Family Meeting (FFM) USFWS indicated that inclusion of such a disturbance threshold was necessary in order for USFWS to have the assurance and certainty necessary when assessing GRSG listing. At that point, outside of Wyoming's Disturbance Density Calculation Tool there was no developed approach to measure or calculate disturbance to evaluate a disturbance cap against.

Idaho BLM invited Dr. Steve Knick to discuss his study regarding disturbance (the only known scientific research describing a disturbance cap). Also as a result of that FFM the BLM's NOC began working on developing a disturbance calculation process that was not as intensive as the Wyoming DDCT approach, based on BLM guidance that anthropogenic disturbance measurement would not follow that approach in other states due the intensive and workload associated with that approach would not be feasible to implement in other states.

Idaho BLM followed the provided guidance to develop biologically significant units (BSUs). The NOC developed 3 equations to try and relate disturbance and habitat. These equations were specifically applicable to broad scales but not applicable to site specific scales. Idaho BLM took the information and built a simple equation measuring and evaluating absolute disturbance to compare against the cap. That equation was defined as:

$$\frac{\textit{Acres of Anthropogenic Disturbance within the BSU}}{\textit{Acres within the BSU}}$$

At the time of the August Federal Family Meeting the Idaho BLM had further refined the previous equation to more accurately reflect the findings in Knick's research. Disturbance was discussed at that meeting and it was evident that there was no other clear guidance from either the WO, the NOC or efforts from other states in this subject. Idaho was the only state to have put effort into the need identified by USFWS and the only effort to have a reasonable, scientifically based approach. Idaho did not intentionally deviate from consistent approaches being developed apart from the other Great Basin planning areas; and in fact until late 2014 Idaho is the only Great Basin planning effort to have put an approach together.

Why is the Idaho calculation important or relevant given that an anthropogenic disturbance cap is not likely to be hit?

Response: Loss of habitat from anthropogenic disturbance is not a major issue in Idaho and Southwestern Montana; however, that does not mean that measurement and evaluation of a disturbance cap can be arbitrary, or any less supportable, or inconsistent with the scientific research available if that research can help inform the conditions and evaluation appropriately.

That is why the Idaho disturbance calculation is defined consistent with the scientific research making it reflective of the known effects to GRSG and supportable to base management decisions upon.

Is loss of habitat from fire considered in the Idaho calculation?

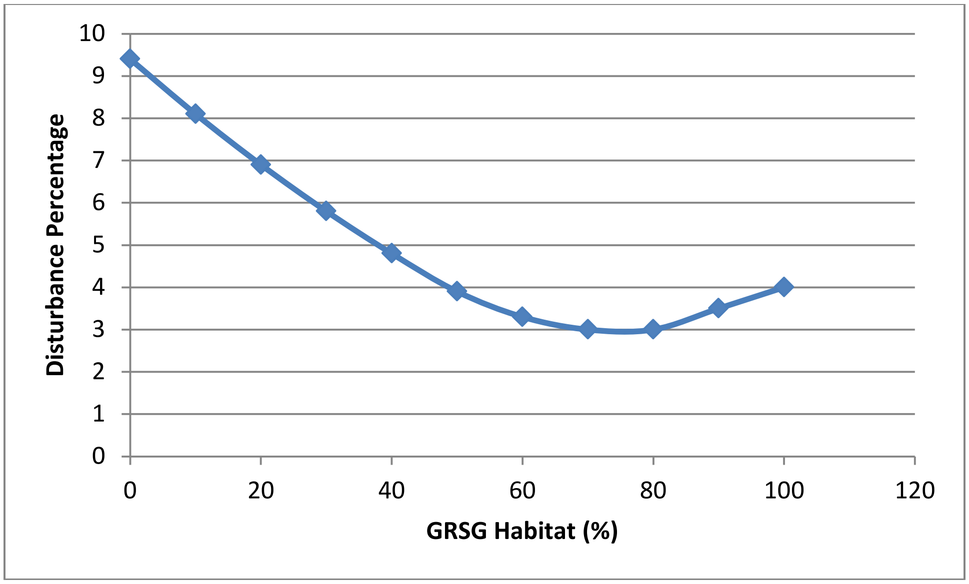
Response: The Idaho calculation does consider the effect fire has on the habitat and includes loss of habitat from fire as part of the calculation by weighting the denominator based on the actual habitat available to the GRSG. The rationale described is in direct reference to the original equation Idaho BLM used:

$$\frac{\textit{Acres of Anthropogenic Disturbance within the BSU}}{\textit{Acres within the BSU}}$$

which does not account for changes in habitat due to loss through fire or gain through restoration. As stated previously Idaho's approach was not developed as a deviation or in comparison to other planning effort attempts at calculating the disturbance cap because such attempts did not yet exist when Idaho's approach was completed.

Why does the Idaho calculation include two terms which seem to complicate the evaluation (the entire area of the BSU and the constant)?

Response: The two terms at issue here are precisely what make the equation relevant and scientifically accurate and supportable, they may make the calculation more complex but natural systems are complex and mathematical equations developed to describe those systems may be somewhat complex. That they are difficult to interpret does not invalidate their inclusion and their value, in numerical description, which those terms contribute to describing a complex situation. The actual relationship described in Knick et al., when graphed would resemble:



This graph shows the conceptual relationship curve of anthropogenic disturbance suggested by Knick et al. In that research it was shown that when anthropogenic disturbance reached 3% within an area surrounding leks (5-18km) then lek attendance was impacted through fewer birds attending on leks. In the graph above the curve assumes that the area described has 3% of its acres under some sort of anthropogenic developed. According to Knick et al. when 70-80 percent of an area is effective habitat for GRSG then anthropogenic development totaling 3% of that area will start to reduce lek attendance. That research also shows that if the effective habitat percentage within that area is over 90% or less than 70% lek attendance is affected when less than 3% of the area contains anthropogenic development. This relationship would mathematically be described using a parabolic (as opposed to a linear) equation, making it a much more accurate reflection of a complex system but also making it even more complex and difficult to interpret. In addition, while Knick et al. suggests this relationship, and defines the effects at a 3% anthropogenic disturbance level in conjunction with 70-80% effective habitat. Knick et al., and we are aware of no other scientific studies, does not describe the trajectory of the curve above 80% or below 60%, so actually developing a more accurate, parabolic formula, is not possible at this time.

The Idaho equation is:

$$Disturbance\ Percentage = \left(\frac{\text{Footprint Acres from Anthropogenic Disturbance in the BSU}}{\text{Acres within the BSU}*\left(\frac{Acres\ of\ Effective\ Habitat\ within\ the\ BSU}{Acres\ within\ the\ BSU}+0.3\right)}\right) \text{X } 100$$

This equation is meant to describe a spatially reality, for that reason it is imperative that the terms be linked with that spatially reality. Without this link any equation descriptive of a spatial reality would become meaningless to the reality it is trying to describe. The purpose of a disturbance cap and a supporting disturbance calculation is to measure and evaluate anthropogenic disturbance over a given area. For the purposes of application this area is defined as the biologically significant unit or BSU. For Idaho the BSU was delineated consistent with BLM guidance and reflective of the Knick et al. research. Idaho's BSU are defined as: all of the modeled nesting and delineated winter habitat, which is based on 2011 data, occurring within Priority and/or Important Habitat Management Areas within individual Conservation Areas for all land ownerships. Modeled nesting habitat is defined as a 10 km area around leks. Based on Idaho Department of Fish and Wildlife surveys and monitoring information this area around leks encompasses a vast majority of the nesting habitat (i.e. IDFG data show that over 90% of nesting occurs within 10 km of the lek). This 10 km is within the 5-18 km range for which Knick et al. identified their research was applicable. Knick communicated to the Idaho ID Team that beyond 18 km the disturbance relationship to lek attendance described in his research was not discernable). The equation calculates a disturbance value within that BSU area by totaling the acres of disturbance within that area and dividing by that area appropriately adjusted by effective habitat within that area to reflect a higher impact of disturbance when effective habitat is lower than the low end of the 70-80% optimum range (This optimum range is also supported by Connelly et al. 2000 (80%) and the BLM's National Technical Team Report (70%)). The equation does not accurately depict the disturbance relationship when effective habitat is greater than 80%. This is due to the fact the equation is linear as opposed to parabolic (discussed earlier) and that the areas within Idaho of most concern for continued presence of GRSG and impacts from anthropogenic disturbance do not exceed 80% effective habitat. Areas of effective habitat greater than 80%, only occurs in the Mountain Valleys Conservation Area where existing disturbance is well below 2%. Therefore the applicability of the equation to these conditions is limited.

Anthropogenic disturbance is being measured and evaluated within the entire BSU, not just the effective habitat area, which is why it is important to define the denominator across the BSU scale, not just a portion of the BSU, which is where the spatial link becomes critical. How the denominator is described mathematically defines the scale over which the numerator is measured; changing that scale would also require adjustments to the numerator to be mathematically correct and maintain the spatial link critical for using a numeric equation to describe a spatial effect.

The presence of the constant (0.3) is a mathematical necessity that defines the relationship, it is neither irrelevant, nor is it a 'correction' factor. Correction implies there is something incorrect or erroneous in the equation. The effective habitat denominator adjustment term:

$$\left(\frac{Acres\ of\ Effective\ Habitat\ within\ the\ BSU}{Acres\ within\ the\ BSU} + 0.3\right)$$

This entire term, in order to accurately reflect Knick et al. (see previous conceptual curve graph), must equal 1 when effective habitat within the BSU represents 70% of the BSU. Without the constant 0.3 added to the effective habitat proportion this term would not equal 1 when effective habitat is at 70%, it would not be a mathematical correct approximation of the disturbance relationship, it would lose its spatial link since this term needs to account for 100% of the acres in the BSU at the 70% habitat/3% disturbance intercept and would therefore become meaningless with respect to the spatial relationship that is being approximated.

Does the Idaho equation allow for more disturbance before hitting the cap than other calculations?

Response: This conclusion would need to be qualified based on the validity of the equation being used for comparison. For example and equation represented by the disturbance relationship expressed as:

$$\frac{Acres\ of\ Disturbance}{Effective\ Habitat}$$

This equation has the benefit of simplicity; however there are several fundamental flaws with this simple calculation which without further refinement to link the spatial reality with the mathematical formula make any comparisons invalid. This equation does not appropriately address: 1) spatial representation; 2) scale of the calculation; 3) consistency with known science; or 4) multiple considerations of single disturbances (i.e. double counting, which links back to the spatial representation aspect of the equation).

When using mathematical equations to describe real-world conditions it is imperative that the link between the spatial conditions and the mathematical representation of those conditions be understood and maintained. Otherwise any comparison does not have an appropriate foundation for comparison and is ultimately of limited, if any, use. To help illustrate this equation would more accurately be written:

$$\frac{(\text{Acres of Disturbance within Effective Habitat} + \text{Acres of Disturbance outside Effective Habitat})}{(\text{Acres of Concern (BSU)} - \text{Acres outside Effective Habitat})}$$

While more complicated, this equation is more accurate in depicting the actual formula used in a spatially representative way. This is further described when all the acres within the Area of Concern or BSU are Effective Habitat; Acres outside Effective Habitat would be zero, effectively eliminating that term and similarly Acres of Disturbance outside Effective Habitat would be zero since there are no acres outside Effective Habitat, therefore eliminating that term as well; leaving the original simplified version of this equation. However, when there are no Acres outside Effective Habitat within the Acres of Concern is the ONLY condition where this simplified equation actually represents and links to the real-world spatial conditions which are being described. So it is ONLY at this point (when the BSU contains 100% Effective Habitat) that the Idaho methodology and this simple equation can be appropriately compared. As described earlier the Idaho methodology (equation) does not accurately reflect the spatial conditions (according to Knick et al.) above 80% Effective Habitat (See previous discussion regarding why this is not a significant issue in need of resolution). Below 70% Effective Habitat where the Idaho methodology reflects the scientific relationships comparisons; the simple equation loses its spatial link and comparisons are not valid or appropriate.

So why is the spatial link lost?

Response: A key principle in translating spatial conditions to mathematical equations is, in this instance, each acre of either disturbance, within effective or outside effective habitat in the equation represents a real acre of disturbance, a real acre within effective habitat or a real acre outside effective habitat. If there are acres outside Effective Habitat within the Area of Concern the more accurate equation described above shows that those acres are REMOVED through subtraction from the denominator. This changes the scale of the calculation effectively redefining the spatial extent over which the Acres of Disturbance appropriate to the new scale/denominator can be measured. So this equation redefines the spatial extent for comparison through removing acres from the denominator, while at the same time it includes acres of disturbance in the numerator. The spatial representation is lost when the same acres are both included in the numerator but removed from the denominator.

Why is the Idaho calculation not applied more broadly, i.e. within other planning areas?

Response: Using Idaho's methodology in other states will be problematic because the site-specific data available in the Key Habitat Map needed to support Idaho's methodology are not readily available in other states. Idaho has collected, reviewed and updated on an annual basis for 12+ years a GRSG Key Habitat Map. This map tracks effective habitat, effects to that habitat from fire, restoration efforts and use by GRSG. This is the data utilized in the adjustment factor for the denominator and it is critical to the use of the equation, without this data actual meaningful application of the equation would not be possible or relevant.

How is effective habitat defined?

Response: For Idaho's methodology effective habitat is taken to be the Key Habitat areas described by the Idaho Key Habitat Map. Key habitat includes areas of generally intact sagebrush that provide sage-grouse habitat during some portion of the year. This map also identifies areas that could provide GRSG habitat or currently provide habitat at less than optimum levels. These areas are also spatially depicted and as described as: R1 – perennial grass areas with limited sagebrush presence; R2 – annual grassland areas with limited perennial grasses or sagebrush presence; and R3- juniper encroachment within areas previously dominated by sagebrush.

Example 1 – Anthropogenic Disturbance

In the Southern Conservation Area the Priority BSU was delineated to include 784,958 acres and the Important BSU was delineated to include 1,036,455 acres, which represent the acres of the Biologically Significant Unit to be used in the denominator. The acres of Effective Habitat in the Priority BSU are 424,656 and in the Important BSU are 447,497. This sets up two equations – one for Priority Habitat Management Areas and one for Important Habitat Management Areas.

The existing footprint acres of disturbance within the Priority BSU are 17,661 acres and the footprint acres of disturbance within the Important BSU are 12,748 acres.

This gives the following two equations to define the baseline disturbance condition in the BSUs:

$$Priority = \frac{17661}{(784958 * ((\frac{424656}{784958}) + 0.3)} * 100$$

$$\text{Or} \quad (\frac{17661}{784958*((0.54)+0.3)}) * 100$$

$$\text{Or} \quad \left(\frac{17661}{784958*(0.84)}\right) * 100$$

Yielding a percent disturbance in the Priority BSU of 2.68%

$$Important = \frac{12748}{(1036455 * ((\frac{447497}{1036455}) + 0.3)} * 100$$

Yielding the percent disturbance in the Important BSU of 1.68%

If by 2015 we project additional development within the Priority BSU to be 2120 acres (a 12% increase) and development within the Important BSU to be 4000 acres (a 30% increase) then the Priority footprint acres becomes 20,161 acres and the Important footprint acres becomes 16,748 acres. The resulting evaluation for this cumulative disturbance is calculated by:

$$Priority = \frac{19781}{(784958*((\frac{424656}{784958})+0.3)} * 100 \quad Important = \frac{16748}{(1036455*((\frac{447497}{1036455})+0.3)} * 100$$

Yielding the percent disturbance as: Priority = 3.00% and Important = 2.21%

In the examples, given the existing disturbance footprint it would require development of an additional 2,120 acres in the Priority BSU and an additional 10,005 acres in the Important BSU before the 3% cap would be engaged.

G.3 Part III – Montana Disturbance Calculation

Montana will use a 3% disturbance cap until the state of Montana strategy, similar to WY's Core Area Strategy that uses a 5% disturbance cap for all lands and all disturbances, is fully implemented. BLM MT will develop, and include in their plans, the conditions to be met prior to the change in the disturbance cap.

I. Use of west-wide habitat degradation data as well as the use of locally collected disturbance data to determine the level of existing disturbance:

   a) In the GRSG Priority Habitat Management Areas in any given Biologically Significant Unit, use the west-wide data at a minimum and/or locally collected disturbance data as available (e.g., DDCT) for the anthropogenic disturbance types listed in **Table G-4**.

II. Use of locally collected disturbance data for project authorizations:

   a) In a proposed project analysis area, digitize all existing anthropogenic disturbances identified in the GRSG Monitoring Framework and the 7 additional features that are considered threats to sage-grouse (**Table G-5**). Using 1 meter resolution NAIP imagery is recommended. Use local data if available.

III. Fire-burned and habitat treatment areas will not be included in the project scale degradation disturbance calculation for managing sage-grouse habitat under a disturbance cap. These areas will be considered part of a sagebrush availability when rangewide, consistent, interagency fine- and site-scale monitoring has been completed and the areas have been determined to meet sage-grouse habitat requirements. These and other disturbances identified in **Table G-4** will be part of a sagebrush availability evaluation and will be considered along with other local conditions that may affect sage-grouse during the analysis of the proposed project area.

IV. Planning units are directed to use a density cap related to the density of energy and mining facilities (listed below) during project scale authorizations. If the disturbance density in a proposed project area is on average less than 1/ 640 acres, proceed to the NEPA analysis incorporating mitigation measures into an alternative. If the disturbance density is greater than an average of 1/ 640 acres, either defer the proposed project or co-locate it into existing disturbed area *(subject to applicable laws and regulations, such as the 1872 Mining Law, valid existing rights, etc.)*.

   - Energy (oil and gas wells and development facilities)
   - Energy (coal mines)
   - Energy (wind towers)

- Energy (solar fields)
- Energy (geothermal)
- Mining (active locatable, leasable, and saleable developments)

V. Planning units are directed to continue using the baseline data from the 2013 USGS Baseline Environmental Report (BER) in the Affected Environment section of the proposed plans/ FEISs. West-wide sagebrush availability and habitat degradation data layers will be used for the Priority Habitat Management Areas in each population for monitoring (see the GRSG Monitoring Framework in the Monitoring Appendix of the EIS) and management purposes as the LUPs are being implemented. The BER reported on individual threats across the range of sage-grouse while the west-wide disturbance calculation consolidated the anthropogenic disturbance data into a single measure using formulas from the GRSG Monitoring Framework. These calculations will be completed on an annual basis by the BLM's National Operation Center. Planning units will be provided the 2014 baseline disturbance calculation derived from the west-wide data once the RODs are signed that describe the Priority Habitat Management Areas.

VI. Planning units are directed to use the three measures (sagebrush availability, habitat degradation, density of energy and mining) in conjunction with other information during the NEPA process to most effectively site project locations, such as by clustering disturbances and/or locating facilities in already disturbed areas. Although locatable mine sites are included in the degradation calculation, mining activities under the 1872 mining law may not be subject to the 3% disturbance cap. Details about locatable mining activities should be fully disclosed and analyzed in the NEPA process to assess impacts to sage-grouse and their habitat as well as to BLM goals and objectives, and other BLM programs and activities.

Additional Information/Formulas

Disturbance Calculations for the BSUs and for the Project Analysis Areas:

- For the BSUs: **% Degradation Disturbance = (combined acres of the 12 degradation threats*) ÷ (acres of all lands within the PHMAs in a BSU) x 100.**
- For the Project Analysis Area: **% Degradation Disturbance = (combined acres of the 12 degradation threats[1] plus the 7 site scale threats[2]) ÷ (acres of all lands within the project analysis area in the PHMA) x 100.**

  [1] see **Table G-6**. [2] see **Table G-5**

Table G-4
Anthropogenic disturbance types for disturbance calculations. Data sources are described for the west-wide habitat degradation estimates
(Table copied from the GRSG Monitoring Framework)

Degradation Type	Subcategory	Data Source	Direct Area of Influence	Area Source
Energy (oil & gas)	Wells	IHS; BLM (AFMSS)	5.0ac (2.0ha)	BLM WO-300
	Power Plants	Platts (power plants)	5.0ac (2.0ha)	BLM WO-300
Energy (coal)	Mines	BLM; USFS; Office of Surface Mining Reclamation and Enforcement; USGS Mineral Resources Data System	Polygon area (digitized)	Esri/ Google Imagery
	Power Plants	Platts (power plants)	Polygon area (digitized)	Esri Imagery
Energy (wind)	Wind Turbines	Federal Aviation Administration	3.0ac (1.2ha)	BLM WO-300
	Power Plants	Platts (power plants)	3.0ac (1.2ha)	BLM WO-300
Energy (solar)	Fields/Power Plants	Platts (power plants)	7.3ac (3.0ha)/MW	NREL
Energy (geothermal)	Wells	IHS	3.0ac (1.2ha)	BLM WO-300
	Power Plants	Platts (power plants)	Polygon area (digitized)	Esri Imagery
Mining	Locatable Developments	InfoMine	Polygon area (digitized)	Esri Imagery
Infrastructure (roads)	Surface Streets (Minor Roads)	Esri StreetMap Premium	40.7ft (12.4m)	USGS
	Major Roads	Esri StreetMap Premium	84.0ft (25.6m)	USGS
	Interstate Highways	Esri StreetMap Premium	240.2ft (73.2m)	USGS
Infrastructure (railroads)	Active Lines	Federal Railroad Administration	30.8ft (9.4m)	USGS
Infrastructure (power lines)	1-199kV Lines	Platts (transmission lines)	100ft (30.5m)	BLM WO-300
	200-399 kV Lines	Platts (transmission lines)	150ft (45.7m)	BLM WO-300
	400-699kV Lines	Platts (transmission lines)	200ft (61.0m)	BLM WO-300
	700+kV Lines	Platts (transmission lines)	250ft (76.2m)	BLM WO-300
Infrastructure (communication)	Towers	Federal Communications Commission	2.5ac (1.0ha)	BLM WO-300

Table G-5
The seven additional features to include in the disturbance calculation at the project scale

1. Coalbed Methane Ponds
2. Meteorological Towers
3. Nuclear Energy Facilities
4. Airport Facilities and Infrastructure
5. Military Range Facilities & Infrastructure
6. Hydroelectric Plants
7. Recreation Areas Facilities and Infrastructure

Table G-6
Relationship between the 18 threats and the three habitat disturbance measures for monitoring and disturbance calculations.

USFWS Listing Decision Threat	Sagebrush Availability	Habitat Degradation	Energy and Mining Density
Agriculture	X		
Urbanization	X		
Wildfire	X		
Conifer encroachment	X		
Treatments	X		
Invasive Species	X		
Energy (oil and gas wells and development facilities)		X	X
Energy (coal mines)		X	X
Energy (wind towers)		X	X
Energy (solar fields)		X	X
Energy (geothermal)		X	X
Mining (active locatable, leasable, and saleable developments)		X	X
Infrastructure (roads)		X	
Infrastructure (railroads)		X	
Infrastructure (power lines)		X	
Infrastructure (communication towers)		X	
Infrastructure (other vertical structures)		X	
Other developed rights-of-way		X	

<u>Project analysis area method for permitting surface disturbance activities:</u>

- Determine potentially affected occupied leks by placing a four mile boundary around the proposed area of physical disturbance related to the project. All occupied leks located within the four mile project boundary and within PHMA will be considered affected by the project.
- Next, place a four mile boundary around each of the affected occupied leks.
- The PHMA within the four mile lek boundary and the four mile project boundary creates the project analysis area for each individual project. If there are no occupied leks within the four-mile project boundary, the project analysis area will be that portion of the four-mile project boundary within the Priority Habitat Management Area.
- Map disturbances or use locally available data. Use of NAIP imagery is recommended. In Wyoming, burned areas are included in this step.
- Calculate percent existing disturbance using the formula above. If existing disturbance is less than 3%, proceed to next step. If existing disturbance is greater than 3%, defer the project.
- Add proposed project disturbance footprint area and recalculate the percent disturbance. If disturbance is less than 3%, proceed to next step. If disturbance is greater than 3%, defer project.
- Calculate the disturbance density of energy and mining facilities (listed above). If the disturbance density is less than 1 facility per 640 acres, averaged across project analysis area, proceed to the NEPA analysis incorporating mitigation measures into an alternative. If the disturbance density is greater than 1 facility per 640 acres, averaged across the project analysis area, either defer the proposed project or co-locate it into existing disturbed area.
- If a project that would exceed the degradation cap or density cap cannot be deferred due to valid existing rights or other existing laws and regulations, fully disclose the local and regional impacts of the proposed action in the associated NEPA.

Background

In the USFWS's 2010 listing decision for sage-grouse, the USFWS identified 18 threats contributing to the destruction, modification, or curtailment of the sage-grouse's habitat or range (75 FR 13910 2010). In April 2014, the Interagency GRSG Disturbance and Monitoring Sub-Team finalized the Greater Sage-Grouse Monitoring Framework (hereafter, framework) to track these threats. The 18 threats have been aggregated into three measures to account for whether the threat predominantly removes sagebrush or degrades habitat. The three measures are:

Measure 1: Sagebrush Availability (percent of sagebrush per unit area)
Measure 2: Habitat Degradation (percent of human activity per unit area)
Measure 3: Density of Energy and Mining (facilities and locations per unit area)

The BLM is committed to monitoring the three disturbance measures and reporting them to the FWS on an annual basis. However, for the purposes of calculating the amount of disturbance to provide information for management decisions and inform the success of the sage-grouse planning effort, the data depicting the location and extent of the 12 anthropogenic types of threats will be used at a minimum in the BSUs and those same 12 anthropogenic and the additional 7 types of features that are threats to sage-grouse will be used in the project analysis areas.

		Scales		
		Broad/Mid (Populations)	**Intermediate (BSU)**	**Local/Project (Seas. Hab.)**
Habitat Degradation	**Unit:**	WAFWA Populations	Biologically Significant Unit	Project/Local Habitat Area[6]
	Area of Interest:	PHMAs	PHMAs	PHMAs
	Data:	Westwide degradation data	Westwide[2], State, Local	State, Local
	Formula (Measure 2a):	12 Degradation Threats / PHMAs in Populations	12 Degradation Threats / PHMAs in BSUs	12 Degradation Threats + 7[7] / PHMAs in Proj.[6]
	Management:	Internal BLM & FS estimates	3% Cap, Adapt. Mgmt[4]	3% Disturbance Cap
	All Lands:	Yes	Yes	Yes
	Fire Included:	No	No	No
	Who:	BLM NOC	BLM NOC[5] or State Offices	State Offices or Field Offices
Sagebrush Availability	**Unit:**	WAFWA Populations	Biologically Significant Unit	n/a
	Area of Interest:	PHMAs	PHMAs	
	Data:	LANDFIRE Updated EVT	Updated EVT or State data	
	Formula (Measure 1a):	Existing Updated Sagebrush / PHMAs in Populations	Existing Updated Sagebrush / PHMAs in BSUs	
	Management:	Internal BLM & FS estimates	Adaptive Management[4]	
	All Lands:	Yes	Yes	
	Fire Included:	Yes	Yes	
	Who:	BLM NOC	BLM NOC[5] or State Offices	
Energy and Mining	**Unit:**	WAFWA Populations	n/a	Project Area & Seasonal Hab.
	Area of Interest:	PHMAs		PHMAs
	Data:	Westwide well & mine data		Westwide[2], State data
	Formula (Measure 3):	Well Pads and Mines[1] / Square Mile		Well Pads and Mines[1] / Square Mile
	Management:	Internal BLM & FS estimates		Project Authorization
	All Lands:	Yes		Yes
	Fire Included:	No		No
	Who:	BLM NOC		BLM NOC or SOs or FOs

ACRONYMS

PHMA = Priority Habitat Management Area *BSU = Biologically Significant Unit*
EVT = Existing Vegetation Type *BpS = Areas of Biotic Potential*

[1] Only mines with a Plan of Operation (>5 acres of disturbance) will be included.
[2] Westwide data will be used only if state or local data are not available.
[3] This footnot was removed from the table. January 2015.
[4] This may be one of several variables used to inform Adaptive Management. The BSU is the scale at which Adaptive Management will be applied.
[5] A moving window analysis will be conducted at this scale by the NOC using westwide data. If available, state and local data/analysis should be used for Adaptive Management
[6] The project analysis area will be based on a 4-mile radius project boundary combined with a 4-mile lek boundary for leks within the 4mi project boundary in PHMA (DDCT methodology).
[7] See Table 2

G.4 Part IV - Adaptive Management

Adaptive Management Habitat Trigger-

The specific formula for the change in habitat for the habitat trigger is defined by the following

Within Idaho and Utah all factors are measured within the modeled nesting and wintering habitat within Priority or Important Habitat Management Areas (calculated separately) by Conservation Area; in Southwest Montana all factors are measured within the Priority Habitat Management Area.

In simple description the adaptive management habitat trigger calculation is the percentage of Effective Habitat (defined as areas of generally intact sagebrush that provide Greater sage-grouse habitat during some portion of the year) within modeled nesting and wintering areas within Priority or Important Habitat Management Areas by Conservation Area within a particular year when compared to the Effective Habitat within modeled nesting and wintering areas within Priority or Important Habitat Management Areas by Conservation Area as of the 2011 baseline. Using Effective Habitat as the metric of comparison removes non-habitat acres from the calculation. The calculation is evaluated within both Priority and Important Habitat Management Areas separately within each of the 10 BSUs.

For purposes of evaluating the adaptive management habitat triggers, Effective Habitat in Idaho is tracked using the Key Habitat Map which is updated annually by BLM in coordination with IDFG, Forest Service, US FWS and Local Working Groups and tracks the areas of generally intact sagebrush providing Greater sage-grouse habitat during some portion of the year. Effective habitat equates to areas described as Key Habitat on the Key Habitat Map. Appendix F contains a description of the Key Habitat Map maintenance and update process including the inclusion of disturbances from fire and temporary disturbances and habitat restoration/rehabilitation.

Factors:

EHP(Y) – where Y is the year and EHC is the acres of Effective Habitat for that year within the baseline 2011 nesting and wintering areas within the Priority Habitat Management Area by Conservation Area

EHI(Y) - where Y is the year and EHI is the acres of Effective Habitat for that year within the baseline 2011 nesting and wintering areas within the Important Habitat Management Area by Conservation Area

ADP(Y) – where Y is the year and AD is the acres of anthropogenic disturbance within Effective Habitat for that year within the 2011 nesting and wintering areas within the Priority Habitat Management Area by Conservation Area

ADI(Y) – where Y is the year and AD is the acres of anthropogenic disturbance within Effective Habitat for that year (Y) within the baseline 2011 nesting and wintering areas within the Important Habitat Management Area by Conservation Area

EHP(2011) – the Effective Habitat within the baseline 2011 nesting and wintering areas within the Priority Habitat Management Area by Conservation Area

EHI(2011) - the Effective Habitat within the baseline 2011 nesting and wintering areas within the Important Habitat Management Area by Conservation Area

ADP(2011) – the acres of anthropogenic disturbance within Effective Habitat within the baseline 2011 nesting and wintering areas within the Priority Habitat Management Area by Conservation Area

ADI(2011) – the acres of anthropogenic disturbance within Effective Habitat within the baseline 2011 nesting and wintering areas within the Important Habitat Management Area by Conservation Area

Formulas:

$$\text{Priority Habitat Management Area} = 100 - \left(\frac{EHP(Y)-ADP(Y)}{EHP(2011)-ADP(2011)}\right) * 100$$

$$\text{Important Habitat Management Area} = 100 - \left(\frac{EHI(Y)-ADI(Y)}{EHI(2011)-ADI(2011)}\right) * 100$$

When this calculation equals or exceeds 10 then an adaptive trigger has been engaged as per AM-7 & AM-8.

Tables 2-7 describe the acreages associated with the BSUs by Conservation Area for the Idaho and Southwestern Montana Subregion. The tables contain values for the entire BSU (Priority and Important), including all ownerships, acres of effective habitat within the BSUs and acres of anthropogenic disturbance within the BSUs.

These values will be used to provide several examples applying the anthropogenic disturbance and adaptive management habitat trigger evaluations. These are for illustrative purposes and do not represent an actual evaluation of ground conditions.

Example 2 – Adaptive Management – Habitat

In the Southern Conservation Area the Priority BSU was delineated to include 784,958 acres, of which 424,656 acres were Effective habitat; therefore EHP(2011) is equal to 424,656 acres. Development within the Effective Habitat in 2011 was measured at 10,074 acres; therefore ADP(2011) is equal to 10,074 acres.

If in 2015 we project a cumulative loss of 42,000 Effective habitat acres due to wildfire (10% loss) and an additional 1000 acres of anthropogenic development (10% increase), then EHP(2015) is equal to 424,656 – 42,000 or 382,656 and ADP(2015) is equal to 10,074+1000 or 11,074. The evaluation for the adaptive management trigger is calculated by:

$$100 - \left(\frac{382656 - 11074}{424656 - 10074}\right) * 100$$

This simplifies to: $100 - \left(\frac{371582}{414582}\right) * 100$

Or $100 - (0.896 * 100)$

Or 100 - 89.6

Or 10.4 – equivalent to 10.4%

This evaluation shows a loss of greater than 10 percent and less than 20 percent which would engage the soft habitat trigger as described in AM-8 and not the hard habitat trigger described in AM-7.

Soft Trigger Considerations and Implementation Actions

The Sage-Grouse Implementation Task Force, in coordination with BLM and Forest Service would utilize monitoring information to assess when triggers have been tripped. When information indicates that the soft habitat or population trigger may have been tripped, a Sage-Grouse Implementation Task Force, in coordination with BLM and Forest Service - aided by the technical expertise of IDF&G - would assess the factor(s) leading to the decline and identify potential management actions. The Sage-Grouse Implementation Task Force may consider and recommend to BLM possible changes in management to the PHMA. As to the IHMA, the Sage-Grouse Implementation Team may review the causes for decline and potential management changes only to the extent those factors significantly impair the state's ability to meet the overall management objective. It is anticipated IDF&G will collect data annually and will make recommendations to the Implementation Team by August 31st for population triggers and January 15th for habitat triggers.

Only where the monitoring information indicates the cause(s) of the decline is not a primary threat will the Sage-Grouse Implementation Task Force would analyze the secondary threats to the species and determine whether further management actions are needed.

Adaptive Management Population Trigger

Framework

Population & Habitat Trigger Justification

Triggers

Because unexpected events (e.g., wildfire, West Nile Virus) may result in a substantial loss of habitat or decline in sage-grouse populations, adaptive management triggers have been developed. These triggers are intended to improve sage-grouse population trends, protect the overall baseline population, preserve a buffer population, and conserve sage-grouse habitat.

The triggers have both population and habitat components. Population components consider population growth and change in lek size. The habitat component considers loss of breeding and/or winter habitat. Lek size has been related to population change in numerous studies (Connelly and Braun 1997, Connelly et al. 2004, Baumgart 2011, Garton et al. 2011). Garton et al. (2011) used both characteristics as well as number of active leks to assess change for sage-grouse populations throughout the west. A variety of researchers (Swensen et al. 1987, Connelly et al. 2000a, Miller et al. 2011) have shown that loss of winter or breeding habitats resulted in decreased sage-grouse populations. The adaptive management triggers set at a lambda value less than one, a 20% decline in males counted on lek routes, and a 20% loss of breeding or winter habitat as break points that would initiate a population or habitat trigger.

Population Growth (Finite Rate of Change)

Although populations cannot be accurately estimated, lek counts of males provide a robust method for assessing population trend and estimating population growth (λ) in an unbiased fashion. Calculating λ (finite rate of change) between successive years for a sage-grouse population is described in Garton et al. (2011). The ratio of males counted in a pair of successive years estimates the finite rate of change (λ_t) at each lek site in that one-year interval. These ratios can be combined across leks within a population for each year to estimate λ_t for the entire population (or Conservation Zone) or combined across all leks to estimate λ_t for the state between successive years as:

$$\lambda(t) = \frac{\sum_{i=1}^{n} M_i(t+1)}{\sum_{i=1}^{n} M_i(t)}$$

where $M_i(t)$ = number of males counted at lek i in year t, across n leks counted in both years t and $t+1$. Ratio estimation under classic probability sampling designs—simple random, stratified, cluster, and probability proportional to size (PPS)—assumes the sample units (leks counted in two successive years in this case) are drawn according to some random process but the strict requirement to obtain unbiased estimates is that the ratios measured represent an unbiased sample of the ratios (i.e., finite rates of change) from the population or other area sampled. This assumption seems appropriate for leks and the possible tendency to detect (or count) larger leks than smaller leks does not bias the estimate of $\boldsymbol{\lambda}_t$ across a population or region (Garton et al. 2011), but makes it analogous to a PPS sample showing dramatically increased precision over simple random samples (Scheaffer et al. 1996). Also precision can be estimated for $\boldsymbol{\lambda}$.

Because small game populations (including sage-grouse) typically fluctuate among years due to weather and other environmental variables, a $\boldsymbol{\lambda}_t$ for any given year is not very meaningful. However, a series of years where $\boldsymbol{\lambda}_t$ remains at or above 1.0 indicates a stable to increasing population. Moreover, this situation would also provide strong evidence of the effectiveness of conservation actions that may have been employed.

Definition of "Significance" for Hard Population Trigger:

The Governor's Alternative (E) did not define criteria for "significantly less than 1.0". For purposes of the Plan, IDFG proposes to use a 90% confidence interval around lambda over a three-year period. to evaluate whether λ is significantly less than 1.0. If the 90% confidence interval is less than and does not include 1.0, than λ is significantly less than 1.0. The λ and variance will be calculated following Garton et al. (2011). A 90% confidence interval is justified because:

1. Under a 90% confidence interval the probability of making a false conclusion is 10%, however, the error will be on the conservative side; i.e., the error would benefit the sage-grouse population.

2. The λ criteria would not be used alone; as stated in the ADPP, λ would be used in concert with trend in maximum number of males.

<u>Males Counted on Leks</u>

Lek attendance by males has been used as an indicator of population trend in some areas since at least the early 1950s. For many years it was the only indicator used to assess status of sage-grouse populations. However, recent research has shown that male attendance at leks can be affected by severity of the previous winter, weather, timing of counts during spring, and a variety of other factors (Emmons and Braun 1984, Hupp 1987, Baumgart 2011). Baumgart (2011) indicated the probability of male sage-grouse attending leks in south-central Idaho varied among years and appeared to be tied to winter severity. Although lek data provide a powerful data set for assessing population trends over time (Garton et al. 2011), counts for a single year may not reflect trends very well. Thus using lek counts as a trigger must consider the inherent variation in these counts. Moreover, males counted on leks appear to have the most value for assessing population change when used in conjunction with other indicators of population status (e.g., finite rate of change).

Emmons and Braun (1984) reported that lek attendance rates varied from 86% for yearling males to 92% for adult males. These rates were pooled over 5 day periods and may have overestimated attendance (Connelly et al. 2011). In contrast, Walsh et al. (2004) reported average daily male attendance rates of 42% (range = 7-85%) and 19% (range = 0-38%) for adult and yearling sage-grouse, respectively but these rates were not adjusted for detection rate and were likely biased low (Connelly et al. 2011). Moreover, this study involved very small sample sizes (17 adult males, 9 yearling males over 15 leks) and only one breeding season and it was not clear whether all leks in the study area were known and sampled. Preliminary data from Utah (D. Dahlgren, personal communication) indicated that in a study area about 30 miles south of Idaho male sage-grouse lek attendance rates varied from roughly 60% at the beginning of April to about 90% at the end of the month. Recent findings in Idaho (Baumgart 2011) predicted the probability of lek attendance for an adult male following an "average" winter would range from 0.894 (SE = 0.025) on week 3 (~1 April) to 0.766 (SE = 0.040) on week 8 (~ 5 May). Published information suggests that a change in maximum number of males counted on leks of say 10-15% cannot confidently be considered a reflection of population status. However, a 20% decline in maximum number of males counted on leks would likely not be related to lek attendance patterns but instead would reflect a population decline. Thus, the trigger was set at 20%.

<u>Habitat Trigger</u>

Numerous studies have documented the negative effects of habitat loss including fire and energy development on sage-grouse (Connelly et al. 2000b, Fischer et al. 1996, Nelle et al. 2000, Doherty et al. 2008), but few studies have related the amount of sagebrush habitat lost to population change. In a Montana study area with a non-migratory sage-grouse population, there was a 73% decline in breeding males after 16% of the study area was plowed (Swenson et al. 1987). Walker et al. (2007) indicated that the lowest probability for lek persistence within a landscape occurred where, within 6.4 km of a lek center, the area has < 30% sagebrush. Similarly, Wisdom et al. (2011) reported sage-grouse occupying landscapes with <27% sagebrush as dominant cover would have a low probability of persistence. Connelly et al. (2000a) showed that a fire in 1989 that removed 58% of the sagebrush cover in sage-grouse breeding and winter habitat led to an almost 95% decline in the breeding population a few years later. Similarly, a fire that removed about 30% of breeding/winter habitat resulted in substantial population declines over the next few years (J. W. Connelly, unpublished data; **Table G-7**). A 30% loss of breeding and winter habitat is thus far the lowest amount of habitat loss for which a population response could be detected and landscapes with < 30% area in sagebrush within 6.4 km of lek center have the lowest probability of lek persistence. Idaho is taking a more conservative approach than suggested by the literature. A soft trigger is set at a 10% loss of breeding or winter habitat in Core or Important management zones of a Conservation Area, which initiates a review of the management approach. A hard trigger is set at a 20% loss of breeding or winter habitat within a Core Habitat Zone of a Conservation Area, which automatically causes a change in management status of the corresponding Important Habitat Zone.

Table G-7
Nest success (%) in SE Idaho study areas before and after a fire in the Table Butte study area. The fire occurred in August 2000.

Year	Area	
	Table Butte	Upper Snake
1999	54	
2000	45	61
2001[a]	18	56
2002	20	65

Literature Cited

Baumgart, J. A. 2011. Probability of attendance and sightability of greater sage-grouse on leks: relating lek-based indices to population abundance. Dissertation, University of Idaho, Moscow.

Connelly, J. W., and C. E. Braun. 1997. A review of long- term changes in sage grouse populations in western North America. Wildlife Biology 3:123-128.

Connelly, J. W., C. A. Hagen, and M. A. Schroeder. 2011a. Characteristics and dynamics of greater sage-grouse populations. Studies in Avian Biology 38: 53-68.

Connelly, J. W., S. T. Knick, M. A. Schroeder, and S. J. Stiver. 2004. Conservation assessment of greater sage-grouse and sagebrush habitats. Western Association of Fish and Wildlife Agencies, Cheyenne, WY.

Connelly, J. W., K. P. Reese, R. A. Fischer, and W. L. Wakkinen. 2000a. Response of a sage grouse breeding population to fire in southeastern Idaho. Wildlife Society Bulletin 28:90-96.

Connelly, J. W., M. A. Schroeder, A. R. Sands, and C. E. Braun. 2000b. Guidelines to manage sage grouse populations and their habitats. Wildlife Society Bulletin 28:967-985.

Doherty, K. E., D. E. Naugle, B. L. Walker, and J. M. Graham. 2008. Greater sage-grouse winter habitat selection and energy development. Journal of Wildlife Management 72:187-195.

Emmons , S. R. and C. E. Braun. 1984. Lek attendance of male sage grouse. Journal of Wildlife Management 48:1023-1028.

Fischer, R. A., K. P. Reese, and J. W. Connelly. 1996a. An investigation on fire effects within xeric sage grouse brood habitat. Journal of Range Management 49:194-198.

Garton, E. O., J. W. Connelly, J. S. Horne, C. A. Hagen, A. Moser, and M. A. Schroeder. 2011. Greater sage-grouse population dynamics and probability of persistence. Studies in Avian Biology 38: 293-382.

Hupp, J. W. 1987. Sage grouse resource exploitation and endogenous reserves in Colorado. Dissertation, Colorado State University, Fort Collins.

Leonard, K. M., K. P. Reese, and J. W. Connelly. 2000. Distribution, movements, and habitats of sage grouse *Centrocercus urophasianus* on the Upper Snake River Plain of Idaho: changes from the 1950's to the 1990's. Wildlife Biology 6:265-270.

Miller, R. F., S. T. Knick, D. A. Pyke, C. W. Meinke, S. E. Hanser, M. J. Wisdom, and A. L. Hild. 2011. Characteristics of sagebrush habitats and limitations to long-term conservation. Studies in Avian Biology 38: 145-184.

Nelle, P. J., K. P. Reese, and J. W. Connelly. 2000. Long- term effects of fire on sage grouse nesting and brood-rearing habitats in southeast Idaho. Journal of Range Management 53:586-591.

Scheaffer, R. L., W. Mendenhall, III, and R. L. Ott. 1996. Elementary survey sampling. Wadsworth Publishing, Belmont, CA.

Swenson, J. E., C. A. Simmons, and C. D. Eustace. 1987. Decrease of sage grouse *Centrocercus urophasianus* after plowing of sagebrush steppe. Biological Conservation 41:125-132.

Walker, B. L., D. E. Naugle, and K. E. Doherty. 2007. Greater sage-grouse population response to energy development and habitat loss. Journal of Wildlife Management 71:2644-2654.

Walsh, D. P., G. C. White, T. E. Remington, and D. C. Bowden. 2004. Evaluation of the lek-count index for greater sage-grouse. Wildlife Society Bulletin 32:56-68.

Wisdom, M. J., C. A. Meinke, S. T. Knick, and M. A. Schroeder. 2011. Factors associated with extirpation of sage-grouse. Studies in Avian Biology 38: 451--472.

Potential Implementation Level Actions to Consider in the Event Soft Trigger Criteria are Met

- Increase monitoring and evaluation of sage-grouse populations in Priority Habitat Management Area (area of concern).
- Implement Priority Habitat Management Area management strategy in corresponding Important Habitat Management Area of the same Conservation Area.
- Implement Priority Habitat Management Area RDFs in corresponding Important Habitat Management Area of the same Conservation Area.
- Not allow any new (large) infrastructure development within the Priority Habitat Management Area (no exceptions allowed).

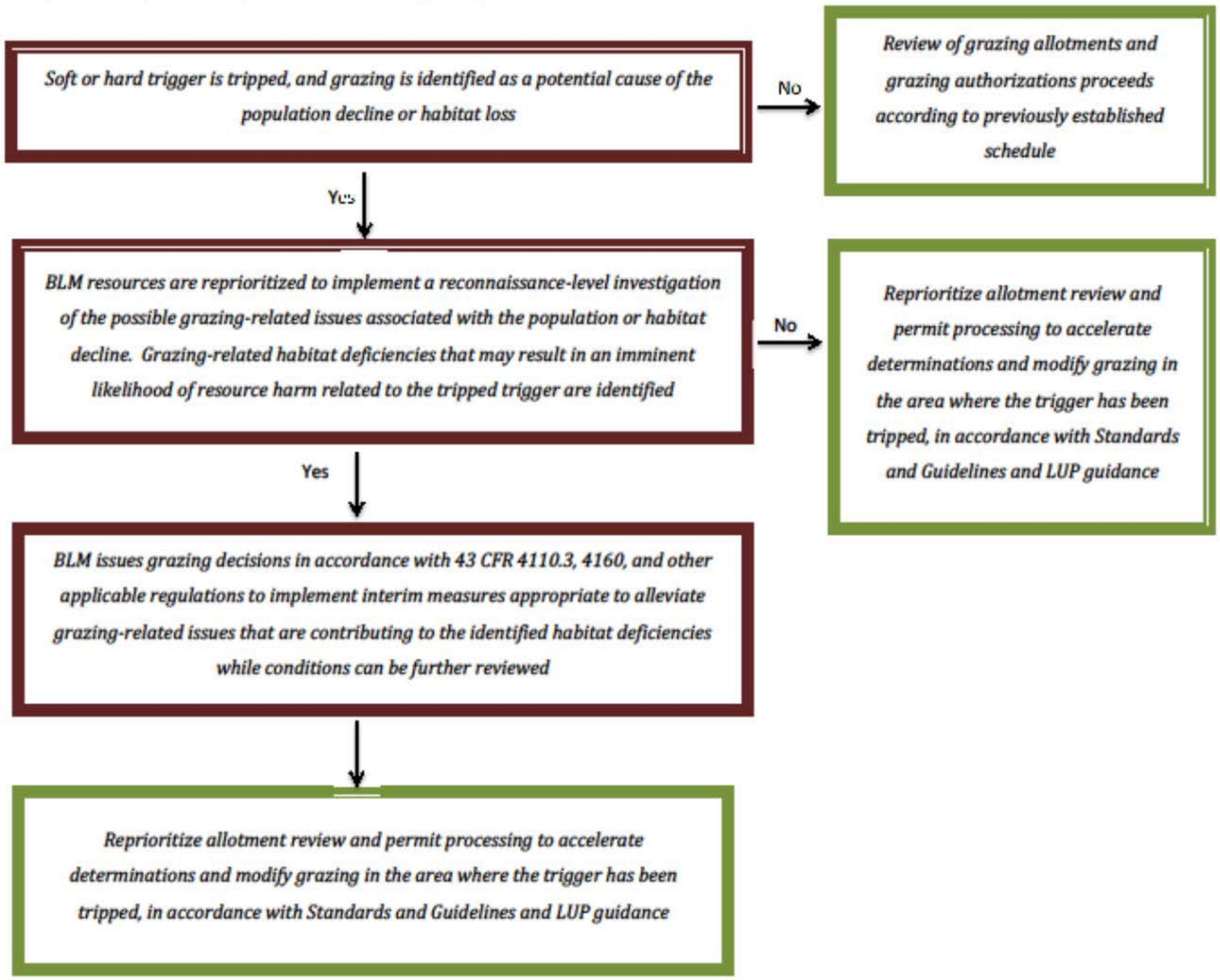
- Reallocate resources to focus on primary threats in the Priority Habitat Management Area (e.g. direct resources from other parts of the state to the area of concern).
- Reallocate resources to focus on secondary threats in the Priority Habitat Management Area (e.g. direct resources from other parts of the state to the area of concern).
- Apply Priority Habitat Management Area criteria for all primary threats, and/or all secondary threats to the Important Habitat Management Area.
- Reallocate resources to focus on primary threats in the Important Habitat Management Area (e.g. direct resources from other parts of the state to the area of concern).
- Reallocate resources to focus on secondary threats in the Important Habitat Management Area (e.g. direct resources from other parts of the state to the area of concern).

Adaptive Grazing Management Response

Improperly managed livestock grazing generally affects seasonal sage-grouse habitat at the site level. Therefore, the specific issues contributing to tripping an adaptive management trigger would need to be defined. Generally, these might be nesting cover from perennial grasses in breeding/nesting habitat, condition and forb availability in brood rearing habitat, and possibly sagebrush cover in winter habitat.

BLM would focus resources to accelerate land health assessments and/or assessment of specific habitat metrics in the areas where deficiencies in site-level habitat metrics are suspected to be a causal factor in tripping a soft or hard trigger. If it is identified that one or more site-level habitat objectives is not being met due to livestock, and an imminent likelihood of resource damage may occur from continued grazing, decisions could be issued in accordance with 4110.3-3(b) to provide immediate protection of resources while a full review of the grazing allotments and grazing permits is conducted. BLM would then focus resources at the state level to accelerate the grazing permit renewal in the area where the trigger has been tripped in order to expedite progress towards meeting land health standards.

Adaptive management response for livestock grazing



G.5 Part V - Travel and Transportation Management Definitions for Use in Anthropogenic Disturbance Calculation

Roads are linear routes managed for use by low clearance vehicles having four or more wheels, and are maintained for regular and continuous use.

Primitive Roads are linear routes managed for use by four-wheel drive or high-clearance vehicles. They do not normally meet any design standards.

Trails are linear routes managed for human-powered, stock, or OHV forms of transportation or for historical or heritage values. Trails are not generally managed for use by four-wheel drive or high-clearance vehicles.

Linear Disturbances are human-made linear features that are not part of the designated transportation network are identified as "Transportation Linear Disturbances." These may include engineered (planned) as well as unplanned single and two-track linear features that are not part of the BLM's transportation system.

Primitive Routes are any transportation linear feature located within a WSA or lands with wilderness characteristics designated for protection by a land use plan and not meeting the wilderness inventory road definition.

Temporary routes are short-term overland roads, primitive roads or trails which are authorized or acquired for the development, construction or staging of a project or event that has a finite lifespan. Temporary routes are not intended to be part of the permanent or designated transportation network and must be reclaimed when their intended purpose(s) has been fulfilled. Temporary routes should be constructed to minimum standards necessary to accommodate the intended use; the intent is that the project proponent (or their representative) will reclaim the route once the original project purpose or need has been completed. Temporary routes are considered emergency, single use or permitted activity access. Unless they are specifically intended to accommodate public use, they should not be made available for that use. A temporary route will be authorized or acquired for the specific time period and duration specified in the written authorization (permit, ROW, lease, contract etc.) and will be scheduled and budgeted for reclamation to prevent further vehicle use and soil erosion from occurring by providing adequate drainage and re-vegetation.

Administrative routes are those that are limited to authorized users (typically motorized access). These are existing routes that lead to developments that have an administrative purpose, where the agency or permitted user must have access for regular maintenance or operation. These authorized developments could include such items as power lines, cabins, weather stations, communication sites, spring

Maintenance Intensities

Level 0

Maintenance Description:

Existing routes that will no longer be maintained and no longer be declared a route. Routes identified as Level 0 are identified for removal from the Transportation System entirely.

Maintenance Objectives:

- No planned annual maintenance.
- Meet identified environmental needs.
- No preventative maintenance or planned annual maintenance activities.

Level 1

Maintenance Description:

Routes where minimum (low intensity) maintenance is required to protect adjacent lands and resource values. These roads may be impassable for extended periods of time.

Maintenance Objectives:

- Low (Minimal) maintenance intensity.
- Emphasis is given to maintaining drainage and runoff patterns as needed to protect adjacent lands. Grading, brushing, or slide removal is not performed unless route bed drainage is being adversely affected, causing erosion.
- Meet identified resource management objectives.
- Perform maintenance as necessary to protect adjacent lands and resource values.
- No preventative maintenance.
- Planned maintenance activities limited to environmental and resource protection.
- Route surface and other physical features are not maintained for regular traffic.

Level 3

Maintenance Description:

Routes requiring moderate maintenance due to low volume use (for example, seasonally or year-round for commercial, recreational, or administrative access).

Maintenance Intensities may not provide year-round access but are intended to generally provide resources appropriate to keep the route in use for the majority of the year.

Maintenance Objectives:

- Medium (Moderate) maintenance intensity.
- Drainage structures will be maintained as needed. Surface maintenance will be conducted to provide a reasonable level of riding comfort at prudent speeds for the route conditions and intended use. Brushing is conducted as needed to improve sight distance when appropriate for management uses. Landslides adversely affecting drainage receive high priority for removal; otherwise, they will be removed on a scheduled basis.
- Meet identified environmental needs.
- Generally maintained for year-round traffic.
- Perform annual maintenance necessary to protect adjacent lands and resource values.
- Perform preventative maintenance as required to generally keep the route in acceptable condition.
- Planned maintenance activities should include environmental and resource protection efforts, annual route surface.
- Route surface and other physical features are maintained for regular traffic.

Level 5

Maintenance Description:

Route for high (maximum) maintenance due to year-round needs, high volume of traffic, or significant use. Also may include route identified through management objectives as requiring high intensities of maintenance or to be maintained open on a year-round basis.

Maintenance Objectives:

- High (Maximum) maintenance intensity.
- The entire route will be maintained at least annually. Problems will be repaired as discovered. These routes may be closed or have limited access due to weather conditions but are generally intended for year-round use.
- Meet identified environmental needs.
- Generally maintained for year-round traffic.
- Perform annual maintenance necessary to protect adjacent lands and resource values.

- Perform preventative maintenance as required to generally keep the route in acceptable condition.
- Planned maintenance activities should include environmental and resource protection efforts, annual route surface.
- Route surface and other physical features are maintained for regular traffic.

Appendix J

Mitigation

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J. Mitigation

J.1 Part I – Regional Mitigation Strategy

J.1.1 General

In undertaking BLM/USFS management actions, and, consistent with valid existing rights and applicable law, in authorizing third party actions that result in habitat loss and degradation, the BLM/USFS will require and ensure mitigation that provides a net conservation gain to the species including accounting for any uncertainty associated with the effectiveness of such mitigation. This will be achieved by avoiding, minimizing, and compensating for impacts by applying beneficial mitigation actions. Mitigation will follow the regulations from the White House Council on Environmental Quality (CEQ) (40 CFR 1508.20; e.g. avoid, minimize, and compensate), hereafter referred to as the mitigation hierarchy. If impacts from BLM/USFS management actions and authorized third party actions that result in habitat loss and degradation remain after applying avoidance and minimization measures (i.e. residual impacts), then compensatory mitigation projects will be used to provide a net conservation gain to the species. Any compensatory mitigation will be durable, timely, and in addition to that which would have resulted without the compensatory mitigation (see glossary).

The BLM/USFS, via the WAFWA Management Zone Greater Sage-Grouse Conservation Team, will develop a WAFWA Management Zone Regional Mitigation Strategy that will inform the NEPA decision making process including the application of the mitigation hierarchy for BLM/USFS management actions and third party actions that result in habitat loss and degradation. A robust and transparent Regional Mitigation Strategy will contribute to greater sage-grouse habitat conservation by reducing, eliminating, or minimizing threats and compensating for residual impacts to greater sage-grouse and its habitat.

The BLM's Regional Mitigation Manual MS-1794 serves as a framework for developing and implementing a Regional Mitigation Strategy. The following sections provide additional guidance specific to the development and implementation of a WAFWA Management Zone Regional Mitigation Strategy.

Developing a WAFWA Management Zone Regional Mitigation Strategy

The BLM/USFS, via the WAFWA Management Zone Greater Sage-Grouse Conservation Team, will develop a WAFWA Management Zone Regional Mitigation Strategy to guide the application of the mitigation hierarchy for BLM/USFS management actions and third party actions that result in habitat loss and degradation. The Strategy should consider any State-level greater sage-grouse mitigation guidance that is consistent with the requirements identified in this Appendix. The Regional Mitigation Strategy should be developed in a transparent manner, based on the best science available and standardized metrics.

As described in Chapter 2, the BLM/USFS will establish a WAFWA Management Zone Greater Sage-Grouse Conservation Team (hereafter, Team) to help guide the conservation of greater sage-grouse, within 90 days of the issuance of the Record of Decision. The Strategy will be developed within one year of the issuance of the Record of Decision.

The Regional Mitigation Strategy should include mitigation guidance on avoidance, minimization, and compensation, as follows:

- Avoidance
    - Include avoidance areas (e.g. right-of-way avoidance/exclusion areas, no surface occupancy areas) already included in laws, regulations, policies, and/or land use plans (e.g. Resource Management Plans, Forest Plans, State Plans); and,
    - Include any potential, additional avoidance actions (e.g. additional avoidance best management practices) with regard to greater sage-grouse conservation.
- Minimization
    - Include minimization actions (e.g. required design features, best management practices) already included in laws, regulations, policies, land use plans, and/or land-use authorizations; and,
    - Include any potential, additional minimization actions (e.g. additional minimization best management practices) with regard to greater sage-grouse conservation.
- Compensation
    - Include discussion of impact/project valuation, compensatory mitigation options, siting, compensatory project types and costs, monitoring, reporting, and program administration. Each of these topics is discussed in more detail below.
        - Residual Impact and Compensatory Mitigation Project Valuation Guidance
            - A common standardized method should be identified for estimating the value of the residual impacts and value of the compensatory mitigation projects, including accounting for any uncertainty associated with the effectiveness of the projects.
            - This method should consider the quality of habitat, scarcity of the habitat, and the size of the impact/project.
            - For compensatory mitigation projects, consideration of durability (see glossary), timeliness (see glossary), and the potential for failure (e.g. uncertainty associated with effectiveness) may require an upward adjustment of the valuation.
            - The resultant compensatory mitigation project will, after application of the above guidance, result in proactive

conservation measures for Greater Sage-grouse (consistent with BLM Manual 6840 – Special Status Species Management, section .02).

- Compensatory Mitigation Options
    - Options for implementing compensatory mitigation should be identified, such as:
- Utilizing certified mitigation/conservation bank or credit exchanges.
- Contributing to an existing mitigation/conservation fund.
- Authorized-user conducted mitigation projects.
    - For any compensatory mitigation project, the investment must be additional (i.e. additionality: the conservation benefits of compensatory mitigation are demonstrably new and would not have resulted without the compensatory mitigation project).
- Compensatory Mitigation Siting
    - Sites should be in areas that have the potential to yield a net conservation gain to the greater sage-grouse, regardless of land ownership.
    - Sites should be durable (see glossary).
    - Sites identified by existing plans and strategies (e.g. fire restoration plans, invasive species strategies, healthy land focal areas) should be considered, if those sites have the potential to yield a net conservation gain to greater sage-grouse and are durable.
- Compensatory Mitigation Project Types and Costs
    - Project types should be identified that help reduce threats to greater sage-grouse (e.g. protection, conservation, and restoration projects).
    - Each project type should have a goal and measurable objectives.
    - Each project type should have associated monitoring and maintenance requirements, for the duration of the impact.
    - To inform contributions to a mitigation/conservation fund, expected costs for these project types (and their monitoring and maintenance), within the WAFWA Management Zone, should be identified.
- Compensatory Mitigation Compliance and Monitoring

- Mitigation projects should be inspected to ensure they are implemented as designed, and if not, there should be methods to enforce compliance.
- Mitigation projects should be monitored to ensure that the goals and objectives are met and that the benefits are effective for the duration of the impact.

- Compensatory Mitigation Reporting
  - Standardized, transparent, scalable, and scientifically-defensible reporting requirements should be identified for mitigation projects.
  - Reports should be compiled, summarized, and reviewed in the WAFWA Management Zone in order to determine if greater sage-grouse conservation has been achieved and/or to support adaptive management recommendations.
- Compensatory Mitigation Program Implementation Guidelines
  - Guidelines for implementing the State-level compensatory mitigation program should include holding and applying compensatory mitigation funds, operating a transparent and credible accounting system, certifying mitigation credits, and managing reporting requirements.

Incorporating the Regional Mitigation Strategy into NEPA Analyses

The BLM/USFS will include the avoidance, minimization, and compensatory recommendations from the Regional Mitigation Strategy in one or more of the NEPA analysis' alternatives for BLM/USFS management actions and third party actions that result in habitat loss and degradation and the appropriate mitigation actions will be carried forward into the decision.

Implementing a Compensatory Mitigation Program

The BLM/USFS need to ensure that compensatory mitigation is strategically implemented to provide a net conservation gain to the species, as identified in the Regional Mitigation Strategy. In order to align with existing compensatory mitigation efforts, this compensatory mitigation program will be managed at a State-level (as opposed to a WAFWA Management Zone, a Field Office, or a Forest), in collaboration with our partners (e.g. Federal, Tribal, and State agencies).

To ensure transparent and effective management of the compensatory mitigation funds, the BLM/USFS will enter into a contract or agreement with a third-party to help manage the State-level compensatory mitigation funds, within one year of the issuance of the Record of Decision. The selection of the third-party compensatory mitigation administrator will conform to all relevant laws, regulations, and policies. The BLM/USFS will remain responsible for making decisions that affect Federal lands.

J.1.2 Glossary Terms

Additionality: The conservation benefits of compensatory mitigation are demonstrably new and would not have resulted without the compensatory mitigation project. (adopted and modified from BLM Manual Section 1794).

Avoidance mitigation: Avoiding the impact altogether by not taking a certain action or parts of an action. (40 CFR 1508.20(a)) (e.g. may also include avoiding the impact by moving the proposed action to a different time or location.)

Compensatory mitigation: Compensating for the (residual) impact by replacing or providing substitute resources or environments. (40 CFR 1508.20)

Compensatory mitigation projects: The restoration, creation, enhancement, and/or preservation of impacted resources (adopted and modified from 33 CFR 332), such as on-the-ground actions to improve and/or protect habitats (e.g. chemical vegetation treatments, land acquisitions, conservation easements). (adopted and modified from BLM Manual Section 1794).

Compensatory mitigation sites: The durable areas where compensatory mitigation projects will occur. (adopted and modified from BLM Manual Section 1794).

Durability (protective and ecological): the maintenance of the effectiveness of a mitigation site and project for the duration of the associated impacts, which includes resource, administrative/legal, and financial considerations. (adopted and modified from BLM Manual Section 1794).

Minimization mitigation: Minimizing impacts by limiting the degree or magnitude of the action and its implementation. (40 CFR 1508.20 (b))

Residual impacts: Impacts that remain after applying avoidance and minimization mitigation; also referred to as unavoidable impacts.

Timeliness: The lack of a time lag between impacts and the achievement of compensatory mitigation goals and objectives (BLM Manual Section 1794).

J.2 Part II – Idaho Mitigation Framework

Framework for Mitigation of Impacts From Infrastructure Projects On Sage-Grouse And Their Habitats

Sage-Grouse Mitigation Subcommittee of the Idaho Sage-Grouse State Advisory Committee[1]

December 6, 2010

J.2.1 Introduction

The Conservation Plan for Greater Sage-grouse in Idaho (Idaho Sage-Grouse Advisory Committee 2006; as amended in 2009) calls for the development of a "proposal for a mitigation and crediting program for sagebrush steppe habitats in Idaho and recommendations for policy consideration" (Measure 6.2.4.). In early 2010, the Idaho Sage-grouse Advisory Committee (SAC) established the Mitigation Subcommittee to complete this task.1 The Mitigation Subcommittee met several times from the late spring, through the fall of 2010 and found broad areas of agreement among its diverse participants.

This report presents the Mitigation Subcommittee's consensus recommendations for the creation of an Idaho-based program to compensate for the impacts of infrastructure projects on sagegrouse and their habitats. This program – called the Mitigation Framework – would serve as a science-based "mitigation module" that project developers and government regulators could use to achieve compensatory mitigation objectives called for in project plans and permits. While compensatory mitigation may help offset certain impacts arising from infrastructure projects, mitigation should not be considered a substitute for first avoiding and then minimizing impacts.

In addition, it is important to recognize that federal and state regulatory or land-management agencies, and county or local governments may also require additional stipulations, conditions of approval or other requirements as well as on-site mitigation, in accordance with applicable law, regulation or policy.

This document proposes a general outline or "skeleton" of policies and procedures for such a program. The Mitigation Framework is designed to be transparent, inclusive, and accountable to defined objectives. The Subcommittee's purpose is to describe the program in enough detail to foster a dialogue among SAC members, spot important issues and points of agreement, and assess the level of support for developing a functioning mitigation program for Idaho sagegrouse and their habitats.

[1] Subcommittee participants: John Robison and Lara Rozzelle, Idaho Conservation League; Brett Dumas, Idaho Power Company; Paul Makela and Tom Rinkes, BLM; Don Kemner, Idaho Department of Fish and Game; Will Whelan and Trish Klahr, The Nature Conservancy; Rich Rayhill, Ridgeline Energy, LLC; Lisa LaBolle and Kirsten Sikes, Idaho Office of Energy Resources; Nate Fisher, Idaho Office of Species Conservation; John Romero, Citizen at Large.

J.2.2 Executive Summary

The state of Idaho is seeing an increasing number of infrastructure projects, such as transmission lines and wind energy facilities, proposed in the state's sagebrush steppe ecosystems. Where federal permits are required, the environmental review process for these projects will analyze how these projects affect sage-grouse and will consider a range of potential mitigation measures to avoid, minimize, or offset any impacts. It is likely that the environmental review process will lead at least some developers and agencies to implement compensatory mitigation.

Compensatory mitigation consists of compensating for residual project impacts that are not avoided or minimized by providing substitute resources or habitats, often at a different location than the project area. For sage-grouse, this would include, among other things, protecting and restoring sagebrush habitats to offset habitat losses and other effects of infrastructure projects.

This framework describes the general outline for a sage-grouse compensatory mitigation program in Idaho. This program would employ an "in-lieu fee" approach to compensatory mitigation through which a project developer would pay funds into an account managed by the mitigation program for performance of mitigation actions that provide measureable benefits for sage-grouse and their habitats within Idaho.

The Mitigation Framework does not alter the legal standards or procedures for review and approval of infrastructure projects. Rather, it offers an option that project developers and/or regulators may choose for implementing mitigation plans and agency permit conditions. It should be emphasized that this program would not relieve project developers and permitting agencies of their obligation to avoid and minimize environmental impacts through appropriate project siting, design and implementation.

Although the initial focus is on sage-grouse, the Mitigation Framework can be readily adapted to provide compensatory mitigation for other sagebrush obligate and associated species. The suitability of the Framework for other species and natural features has not been evaluated.

The objectives of the Mitigation Framework include:

- Provide a credible, efficient, transparent, and flexible mechanism to implement compensatory mitigation;
- Ensure that sage-grouse impacts are offset by actions that benefit the affected species and habitats;
- Provide increased certainty for developers and agencies;
- Involve private and public partners in crafting solutions;
- Provide developers the opportunity to offset the impacts of project development and operation on sage-grouse and sage-grouse habitat, and provide a consistent

mechanism to offset impacts to the species that can be evaluated in future reviews of the species' status; and

- Evaluate issues based on best available scientific information, while acknowledging and responding to scientific uncertainty.

The Mitigation Framework would be established through a memorandum of agreement (MOA) among entities that have the capacity and commitment to assist in its implementation. Such parties may include land and wildlife management agencies, counties, tribes, participating private infrastructure development companies, and non-governmental organizations. The MOA would define the specific roles and responsibilities, procedures, and tasks needed to operate an Idaho-based compensatory mitigation program.

The Mitigation Framework envisions a program with the following attributes: (1) a Mitigation Team and program administrator to steer the mitigation program and ensure strong oversight; (2) technically sound and transparent guidelines for estimating compensatory mitigation costs; (3) a science-based statewide strategy to guide the selection of mitigation actions that will receive funding; (4) provisions that the costs of operating the program will be borne by infrastructure developers that use the Mitigation Framework to deliver compensatory mitigation; (5) monitoring the implementation and effectiveness of mitigation actions funded by the Mitigation Framework program; (6) a system to track benefits provided by the Mitigation Framework to sage-grouse habitat in Idaho; and (7) periodic evaluation and adaptation of the Mitigation Framework program.

This framework provides only a general outline of a proposed Idaho-based compensatory mitigation program. It is intended to assess the level of support for crafting the agreements and completing the technical tasks needed to bring the Mitigation Framework into being.

J.2.3 Discussion

I. The Role of Compensatory Mitigation in Infrastructure Development and Sage-grouse Conservation

A. Mitigation Basics

Broadly defined, "mitigation" refers to a wide range of measures that are taken to avoid, minimize, rectify, reduce, or compensate for the adverse impacts of actions affecting the environment. See 40 C.F.R. § 1508.20 (definition of "mitigation" in National Environmental Policy Act (NEPA) rules). In this general sense, mitigation should be an integral part of all phases of project planning and implementation.

The focus of this report is on compensatory mitigation – also known as "biodiversity offsets" or "offsite mitigation." Compensatory mitigation consists of compensating for residual project impacts that are not avoided or minimized by providing substitute resources or habitats, often at a different location than the project area. For instance, a project developer may fund the restoration of a particular type of habitat in order to replace or "offset" similar habitat that is lost as a result of project construction.

This Framework adopts an "in-lieu fee" approach to compensatory mitigation. Under this approach, a project developer provides funding to a compensatory mitigation program administrator who then distributes the funds to the appropriate government agency, foundation or other organization for performance of mitigation actions. In an in-lieu fee program, the responsibility for actually delivering the compensatory mitigation is transferred from the developer to the program administrator once the developer provides the necessary funds to the in-lieu fee program. It is important to emphasize that compensatory mitigation does not relieve project developers and permitting agencies of their obligation to avoid and minimize environmental impacts. This Framework endorses the principle known as the "mitigation hierarchy," which holds that decision makers should consider the elements of environmental mitigation in the following order of priority:

1. Avoid environmental impacts through project siting and design;
2. Minimize the impacts during construction, operation. maintenance, and decommissioning by implementing appropriate conservation measures related to timing and conduct of project activities;
3. Restore areas that have been disturbed or otherwise rectify on-site project-related impacts to the greatest extent practicable; and
4. Compensate for residual impacts (direct and indirect effects that are not mitigated on-site) by providing replacement habitats or other benefits.

This means that compensatory mitigation is addressed only after efforts to avoid, minimize, and mitigate the impacts have been addressed. It also should be noted that significant impacts to habitat areas that support special functions and values for sage-grouse may simply not be replaceable through mitigation and therefore the best course may be to avoid those areas altogether.

B. Need for an Idaho Compensatory Mitigation Program

In recent years, the state of Idaho has seen an increase in the number of major infrastructure projects proposed in the state's sagebrush steppe ecosystems. Several current proposals involve high voltage transmission lines that would cross over hundreds of miles of sage-grouse habitat. Large scale energy infrastructure projects such as wind farms may also affect large areas of sagegrouse habitat. Where these projects are located at least partially on federally managed public lands they will be required by federal law to go through an extensive environmental review process under NEPA before relevant federal permits are issued. The NEPA process requires the permitting agencies to consider the projects' environmental effects (both positive and negative), alternatives, and potential mitigation measures. Impacts on sage-grouse will be one of the topics analyzed in the NEPA process.

Even after efforts are taken to avoid and minimize impacts, it is possible that some of these infrastructure projects will degrade some sage-grouse habitat, cause direct sage-grouse mortality, or lead to indirect effects such as avoidance of previously occupied habitat. The extent to which project developers and regulators adopt compensatory mitigation as a means to offset these impacts is not fully known. However, it is likely that at least some developers and regulators will seek to implement compensatory mitigation to benefit sage-grouse and their habitats. Energy companies and other developers face daunting challenges in carrying out compensatory mitigation for sage-grouse habitat. Just identifying specific mitigation actions requires a major effort. Actually implementing sagebrush restoration and enhancement projects is even more difficult and expensive – typically involving years of effort and a significant risk of failure. Delivering this type of technically complex environmental mitigation may be well outside the core business of many infrastructure developers.

C. Advantages of the Mitigation Framework

The Mitigation Framework proposes to respond to these challenges by creating a statewide program to deliver scientifically sound compensatory mitigation for multiple projects. Project developers and regulators would no longer have to design, fund and implement their own mitigation programs. Instead, they would have the option of contributing money to a central fund overseen by agencies with expertise in habitat management and non-governmental partners with similar experience. This approach to compensatory mitigation offers three major advantages. The first advantage stems from the increased efficiency of an Idaho-wide mitigation program compared with fragmented, project-by-project mitigation programs. Mitigation efforts require a significant investment in planning, administration, project oversight, and monitoring. The Mitigation Framework would consolidate these functions, thus avoiding needless duplication. The second advantage is that a state mitigation fund can be used for sage-grouse conservation more strategically and at a greater scale than project-by-project mitigation. As described in more detail below, the Mitigation Framework would fund sage-grouse habitat protection and restoration projects in accordance with a statewide strategy that uses landscape-scale analyses to identify the specific measures and habitats that will provide the greatest benefit for Idaho sagegrouse populations. This Idaho-based mitigation strategy will be integrated with other conservation strategies throughout the range of sage-grouse to ensure that actions taken in Idaho benefit the species as a whole. Third, this method can engage the capacity and competence of natural resources agencies, local governments, private companies, and non-governmental organizations. The Mitigation Framework proposes to enlist these entities in shaping Idaho's strategy, developing criteria for use of the fund, and proposing and implementing habitat protection and restoration projects. The benefits of the Mitigation Framework can be summarized as follows:

Benefits for Project Developers:
An efficient and reliable mechanism for meeting compensatory mitigation objectives and permit conditions; and increased certainty regarding project costs.

Benefits for Regulatory Agencies:
Increased certainty that in-lieu fees will result in strategic "on-the-ground" mitigation actions that benefit sage-grouse.

Benefits for Sage-Grouse:
Increased certainty that scientifically sound mitigation actions that benefit sage-grouse and offset impacts and habitat losses associated with infrastructure development will be implemented.

D. Ensuring Accountability

In-lieu fee compensatory mitigation does pose one potentially significant drawback that must be acknowledged and addressed: a poorly designed program may lack accountability for delivering meaningful on-the-ground benefits for sage-grouse. Simply having a project developer contribute to an in-lieu fee mitigation account does not by itself compensate for the sage-grouse impacts caused by the project. Actual mitigation is possible only after well-conceived habitat protection and restoration projects are planned, funded, implemented, monitored, and successful in achieving stated objectives. The Mitigation Framework seeks to ensure accountability by adopting a series of rigorous and transparent procedures. As described below, the Framework would: (1) ensure that program administration and monitoring functions are adequately funded; (2) provide technically sound guidelines for estimating the costs of delivering compensatory mitigation; (3) establish a science-based statewide strategy to guide the program; (4) develop project selection criteria and a request for proposals based on the strategy; (5) require monitoring of the implementation and effectiveness of mitigation actions funded by the program; (6) track benefits the Mitigation Framework program provides to sage-grouse in Idaho; and (7) require periodic evaluation of the program. Taken together, these procedures provide a high degree of certainty that the Mitigation Framework will be able to turn in-lieu fee payments into tangible, lasting compensatory mitigation for sage-grouse. As described in greater detail in Section E, below, project developers that seek to use the Mitigation Framework will need to show two things. First, they will need to show that their projects' impacts on sage-grouse and their habitats have been evaluated using a scientifically sound process. Second, they will need to show that their contributions to the mitigation fund reflect the Mitigation Framework's compensation guidelines to ensure that funding will be adequate to offset project impacts. Having demonstrated those things, the project developers should then be able to rely on their in-lieu fee contribution to the mitigation account as satisfying their compensatory mitigation objectives or obligations.

II. Core Elements of Idaho Sage-Grouse Mitigation Program

A. Program Objectives

- Provide a credible, efficient, transparent, and flexible mechanism to implement compensatory mitigation;
- Ensure that sage-grouse impacts are offset by mitigation actions that benefit the sage-grouse and their habitats;
- Provide increased certainty for developers and agencies;
- Involve private and public partners in crafting solutions;
- Provide developers the opportunity to offset project impacts on sage-grouse and sage-grouse habitat, and provide a consistent mitigation mechanism that can be evaluated in future reviews of the species' status; and
- Evaluate issues based on best available scientific information while acknowledging and responding to scientific uncertainty.

B. Scope

The Mitigation Framework proposes to mitigate for impacts to Idaho sage-grouse and their habitats in Idaho. The initial focus of the Mitigation Framework is on sage-grouse. However, this program can be readily adapted to provide compensatory mitigation for other sagebrush obligate and associate species, such as pygmy rabbits, if project developers and regulators call for such mitigation.

Whether this Framework is suited for mitigation of impacts to a broader suite of species or natural features has not been evaluated. It should be noted that some subcommittee members expect to advocate in other forums that compensatory mitigation should extend beyond sagegrouse. The Mitigation Framework focuses on infrastructure projects because this type of development is the most likely to give rise to compensatory mitigation under existing environmental policies. As used here, the term "infrastructure" refers to building structures that significantly disturb sage-grouse habitat, including but not limited to projects for electricity transmission, energy generation, pipeline conveyance, transportation, communications, and similar purposes. The Mitigation Framework is not intended to apply to existing projects that are not changing in scope or to the renewal of on-going activities, such as grazing permits. In addition, the Framework is not suited to projects with minor impacts because their contributions to the mitigation program would be too small to justify the effort needed to establish and administer inlieu fee payments.

C. Integration with Environmental Review Procedures

The Mitigation Framework does not alter the legal standards or procedures for review and approval of infrastructure projects. Rather, the Framework offers an option that project developers and/or regulators may choose for implementing mitigation plans and agency permit conditions. The Mitigation Framework is intended to complement the environmental review process conducted pursuant to NEPA and other federal environmental laws as well as county land use planning authorities. Many energy and other infrastructure projects undergo review and approval at the county level. The issues examined and the level of environmental analysis varies widely among individual counties and individual developers. If a county or developer decides to address sage-grouse impacts, it will be able to use the Mitigation Framework as a mechanism for meeting compensatory mitigation objectives that may arise from the county permitting process.

D. Mitigation Strategy

The next step focuses on the Mitigation Team's task of developing a statewide, science-based strategy that will guide the use of the mitigation fund. The mitigation program strategy would establish priorities for the use of compensatory mitigation funding based on factors/risks identified in the U.S. Fish and Wildlife Service's 12-Month Findings for Petitions to List Greater Sage-Grouse (*Centrocercus urophasianus*) as Threatened or Endangered (USFWS 2010) and in the Conservation Plan for Greater Sage-grouse in Idaho (2006). The strategy sets mitigation priorities with a landscape view of sage-grouse needs and highlights mitigation opportunities in Idaho based on best available science. In setting priorities, the strategy considers species and community size, landscape condition, and regional context. The strategy is responsive to the threats and risks described in the sage-grouse 12- month findings. The strategy will also generally describe the types of mitigation actions, project specifications, and best practices that are likely to produce measureable benefits for sage-grouse habitat. Finally, the strategy addresses both implementation and effectiveness monitoring requirements for mitigation actions funded through the program. The Mitigation Framework's strategy will draw heavily from the State of Idaho's sage-grouse conservation plan but has a narrower focus. It is intended to provide the specific guidance on program priorities, accepted mitigation measures, and geographic areas of emphasis that potential mitigation project sponsors will need to know when they apply for funds. The strategy plays a crucial role in steering mitigation funding to those activities and places that can provide the most effective benefits for Idaho sage-grouse populations consistent with strategies to increase the viability of the species throughout its range. To this end, the strategy will address one of the major policy questions that arise in the design of compensatory mitigation systems: how closely should the mitigation actions be linked to the type and location of the habitat that was originally affected by the infrastructure project. Stated in the alternative, does removal of the mitigation action from the area of impact improve the effectiveness of or benefit from the action. Some compensatory mitigation systems place a heavy emphasis on this link by favoring "in-kind" and "on-site" compensatory mitigation over "out-of-kind" and "off-site" compensatory mitigation. The subcommittee members generally favor an approach that allows funding to flow to the projects and locations within Idaho that will provide the greatest overall positive impact on sage-grouse populations. The Mitigation Framework calls for a monitoring program that would assess habitat gains provided by mitigation actions and compare them with the mitigation objectives of the participating infrastructure projects. The nature and purpose of this monitoring is described more fully in Mitigation Program Step 4, below.

Once the strategy is complete, the Mitigation Team will develop project ranking criteria and procedures that will guide the selection of the mitigation actions that will receive funding. The goal is to fund projects that provide high quality, lasting benefits based on landscape scale analyses that actually compensate for project impacts.

E. Compensation Guidelines

The Mitigation Framework Program will develop guidelines that may be used by developers and/or regulators to determine the cost of meeting their compensatory mitigation objectives. These compensatory mitigation objectives determine the extent of compensatory mitigation for each project and are generally incorporated into project plans or permits. The compensation guidelines will provide transparent, technically sound principles for determining how much it costs to deliver habitat mitigation for sage-grouse. In other words, the guidelines will represent best estimates of the true cost of implementing the mitigation actions needed to meet each project's compensatory mitigation objectives. The guidelines may be used by the project developer and the Mitigation Framework Program Administrator to establish the in-lieu fee that the developer will contribute to the mitigation fund. Specific valuation methods will be developed at a later time and will likely draw from compensatory mitigation systems used elsewhere in the West. Although the details have yet to be worked out, the following outline illustrates the core concepts and principles (shown in bold lettering) that are likely to be employed by the MOA parties in setting the Mitigation Framework's in-lieu fee structure.

- A common unit of measurement would be established for describing and tracking both the project impacts and the benefits of any compensatory mitigation actions. This unit of measurement can be a physical unit such as "acres impacted" or more specifically "acres of summer brood rearing habitat impacted" or "habitat units" lost.
- While the "common unit of measurement" noted above addresses the area of habitat impacted and mitigated, habitat compensation ratios are used to address the quality of the habitat affected by the infrastructure project. These ratios could specify the number of acres of mitigation required per acre of impacted habitat based on the size, habitat quality/condition and function of the impacted habitat; for more critical or important habitat, more mitigation acres might be required. Thus, habitats with higher quality and importance could have higher compensation ratios.
- Several factors are taken into account in calculating how much it will cost to actually compensate for the acres or habitat units. The recommended approach is to evaluate on the costs of implementing a conceptual portfolio of potential mitigation actions or offset activities that provide benefits for sage-grouse. This portfolio of model projects would include a balanced mix of accepted habitat protection and restoration measures reflecting the types of projects expected to be funded by the mitigation program (in accordance with the strategy discussed above). Examples of projects in this portfolio may include such actions as restoring sagebrush canopy and a native understory on recently burned land, improving riparian areas and wet meadows in early brood-rearing habitat, conservation easements to prevent habitat loss, and land management practices that improve sage-grouse habitat. Project costs include the full range of expenses needed to complete all phases of the mitigation action, including administration and monitoring. The average costs of these model mitigation actions per acre or habitat unit is the foundation of the in-lieu fee calculation.
- In addition, the in-lieu fee should also be adjusted to take into consideration the issue of lag time –the time between when habitat is lost at the impacted site relative to when habitat functions are gained at the compensation site.
- The fee also needs to account for contingencies associated with delivering compensatory mitigation, including an estimate of the risk of failure (i.e., the probability that offsite mitigation will not result in any measureable conservation outcomes) for each mitigation site or project.
- In addition to the fee calculated above, costs for establishing and operating the program, including travel, technical consultation and monitoring of program effectiveness must be included. This overhead fee could range from 5-15% depending on the size and complexity of the proposed mitigation program.

F. Program Structure and Oversight

The Mitigation Framework would be established through a memorandum of agreement (MOA) among the entities that would participate in its implementation. The MOA would define the specific roles and responsibilities, procedures, and tasks needed to operate an Idaho-based compensatory mitigation program. The MOA would serve as a joint powers agreement for state and local government parties. The MOA would establish the following administrative structure for the Mitigation Framework:

1. Core Team: A core group would oversee the Mitigation Framework program and provide policy-level guidance for the Science Team and Fund Administrator, described below. The Core Team would be composed of three to seven representatives of diverse perspectives among the MOA signatories.

2. Science Team: A team of experts drawn from MOA signatories and other targeted organizations will administer the science-based and technical aspects of the program. The Science Team would consist of several individuals with expertise in relevant areas such as habitat protection and restoration, landscape ecology/spatial analysis, wildlife biology, sage-grouse ecology, project development, and mitigation policy.

The Team would focus on developing the policies and statewide strategy that will guide the program, making requests for mitigation project proposals (RFPs), ranking mitigation proposals that will receive funding, tracking monitoring reports and project benefits, and evaluating program success.

3. Program Administrator: A program administrator will be responsible for fund management and administrative tasks. The program administrator will provide administrative support for the Mitigation Team, manage the mitigation account, and administer grants, contracts, and other agreements.

4. Advisory Committee: A broader advisory committee consisting of agencies, companies and organizations with the skills and commitment that will provide useful advice to the Core Team regarding the implementation of the Mitigation Framework. The specific make up of each of these groups will be determined at a later time. Potential participants in the Mitigation Framework include but are not limited to representatives of:

State of Idaho:
Department of Fish and Game
Office of Energy Resources
Office of Species Conservation
Idaho Department of Lands

United States:
Bureau of Land Management
U.S. Fish and Wildlife Service
U.S. Forest Service
Natural Resources Cons. Service

Energy Companies:
Idaho Power
Ridgeline Energy
Idaho Tribes
Idaho Sage-Grouse Advisory Committee
Sage-Grouse Local Working Groups

Non-Governmental Organizations:
Idaho Conservation League
The Nature Conservancy
Idaho Counties
Public Land Users (e.g., grazing interests)

G. Funding the Mitigation Program

The costs of administering the program will be sustained by the project developers that seek compensatory mitigation. Therefore, a portion of the in-lieu fee that project developers contribute to the mitigation account will be applied for program administration. As noted above, protecting and restoring sagebrush habitats are time consuming and expensive undertakings. Ensuring that these activities are conducted with strong oversight should be viewed as an exceptionally wise investment.

III. Mitigation Program Steps

The Mitigation Framework envisions a five-step process for developing, implementing, and monitoring compensatory mitigation.

A. Step 1 – Assessment of Project Impacts and Development of Mitigation Objectives

Assessment of project impacts should be undertaken by the project developers proposing new infrastructure projects and the government agencies that conduct environmental reviews of those projects. Although the Mitigation Framework process is not responsible for this step, it is nevertheless crucial to the integrity of the mitigation program. Specifically, the Framework's success in achieving its goal of offsetting major infrastructure project impacts on sage-grouse depends on an accurate accounting of those impacts. For many projects, this analysis will be done as part of the environmental review procedures required by NEPA. As noted above, NEPA requires federal agencies to address the full range of direct, indirect and cumulative impacts of the proposed project, alternatives to the proposed action, and potential mitigation before they act on permit applications. Once impacts have been assessed and compensatory mitigation objectives set, the project developer is ready to engage the Mitigation Framework, starting with determining the developer's in-lieu fee contribution.

B. Step 2 – Determine the In-lieu Fee Contribution

The goal of Step 2 is to use valuation techniques, such as the guidelines presented above, to convert the complex range of project impacts, including direct, indirect and cumulative impacts, into monetary terms that become the basis for the in-lieu fee payment. The accepted in-lieu fee compensatory mitigation plan could be a condition of the instrument approving the project (FONSI, ROD, right-of-way grant, conditional use permit, etc.) and thus legally requires the project developer comply with the approved mitigation plan.

C. Step 3 – Commitment of Mitigation Funds by Project Developer

Infrastructure project developers can employ the Mitigation Framework by entering into an agreement with the program administrator with regard to a specific infrastructure project. This project agreement sets forth the parties' respective responsibilities, including the project developer's commitment to pay the in-lieu fee. Importantly, the agreement provides that the project developer's funds can only be used for the purposes set forth in the Mitigation Framework. The agreement may also include "conditions" as requested by regulatory agencies or project developers. For instance, the agreement might provide that the in lieu fee will be used to fund mitigation actions in specific geographic areas in order to meet permit requirements. The program administrator, based on consultation with the MOA parties, may decline to enter into an agreement that is inconsistent with the Mitigation Framework principles or includes conditions that are burdensome or unworkable. Once the agreement specifying the payment structure and schedule is signed, the project developer makes the required in-lieu fee deposits to an interest bearing account managed by the program administrator. After the completion of this step, the project developer is no longer engaged in the Mitigation Framework – unless it has decided to participate as a MOA party.

D. Step 4 – Issue Request for Proposals (RFP) and Select, Implement, and Monitor Mitigation Actions

At least at annual intervals, the Mitigation Team will issue an RFP that invite private companies, non-governmental organizations, and agencies to submit proposals for sage-grouse habitat protection, restoration, and/or enhancement actions. The RFP will provide guidance to mitigation project sponsors on program priorities and criteria. These priorities and criteria will be drawn from the mitigation program strategy including identification of geographic areas where mitigation might provide the greatest benefits as well as identification of the threats that present the highest risk to the species or its core habitat. The Mitigation Team should also reach out to federal, state, and local agencies, non-governmental organizations and the general public in order to facilitate discussion, engage stakeholders, raise awareness of the program and generate responses to the RFP. The RFP will solicit project proposals that contain an operation or implementation plan and address at least the following elements:

- Geographic area;
- Threats addressed and how the mitigation action project will offset impacts resulting from those threats;
- An analysis of current sage-grouse conditions in the area;
- Resource goals and objectives the mitigation action project will seek to provide;
- A description of any coordination with federal, state, tribal and local resource management and regulatory authorities or other stakeholder involvement required to complete the mitigation action (e.g., requirement for NEPA compliance or county permit);
- A description of recent or proposed projects and events in the vicinity of the proposed project, if any, such as fire rehabilitation treatments, restoration or enhancement treatments or other activities that complement the effectiveness or intent of the proposed, mitigation action;
- A description of the long term protection, management, stewardship for the project being implemented, and the entity responsible for these activities; and
- A commitment to periodic evaluation and reporting on the progress of the project in meeting stated goals and objectives, including a process for adaptively redirecting the project if necessary.

When selecting projects, the Mitigation Team will estimate the biological benefits of the projects activities, the likely success of those activities, the duration of benefit expected and measure those benefits in relation to the strategy and RFP objectives. Mitigation Team and the program administrator will work together on continuing program administration and oversight including annual reporting of program activities, expenditures, and benefits. An annual program report will describe program activities, budget, and assessment of whether the mitigation strategy and associated projects are benefitting sage-grouse and at what level or scale. The Mitigation Team and/or Program Administrator should implement a monitoring program to measure and validate whether project-specific objectives have been met. Monitoring is required of all compensatory mitigation actions to determine if the project is meeting its performance standards and objectives. As mentioned above, at regular intervals, the total habitat and/or population gains provided by the programs will be compared with the habitat/population losses associated with the participating infrastructure projects. The purpose of this comparison is to evaluate the mitigation program and make any necessary program adjustments – particularly if the monitoring shows that the mitigation benefits are not compensating for habitat losses. This comparison will not be a basis for imposing new, unexpected requirements on the infrastructure project developers.

J.2.4 Conclusion

The framework of policies, principles and procedures outlined above are meant to start a dialogue among parties engaged in sage-grouse conservation and infrastructure development. If these parties agree with the Mitigation Subcommittee that there is great value in establishing an Idaho-based compensatory mitigation program, then this framework will mark the beginning of an inclusive effort to fill in the details and complete the tasks needed to bring such a program into being. We have confidence in our collective ability to create a compensatory mitigation program that will benefit infrastructure developers, agencies, conservation interests, and – not least – Idaho's sage-grouse.

J.3 Part III – Idaho - Net Conservation Gain Process

J.3.1 Introduction

The Net Conservation Gain strategy is a means of assuring that proposed anthropogenic activities, when approved and implemented will not result in long-term degradation of Greater Sage-Grouse habitat or population and will have a net conservation benefit to the species. The steps below describe a screening process for review of proposed anthropogenic activities. The goal of the process is to provide a consistent approach regardless of the administrative location of the project and to ensure that authorization of these projects will not contribute to the decline of the species. Though the initial Steps (1-6) are done prior to initiating the NEPA process, the authorized officer must ensure that appropriate documentation regarding the rationale and conclusion for each is included in the administrative record.

The flow chart provides for a sequential screening of proposals. However, Steps 2-6 can be done concurrently.

J.3.2 Step 1

This screening process is initiated upon formal submittal of a proposal for authorization for use of federal lands (BLM or Forest Service). The actual documentation would include, at a minimum, a description of the location, scale of the project, and timing of the disturbance and would be consistent with existing protocol and procedures for the specific type of use. It is anticipated that the proposals would be submitted by a third party.

J.3.3 Step 2

This initial review would evaluate whether the proposal would be allowed as prescribed in the Greater-Sage-Grouse Land Use Plan Amendment. For example, certain activities are prohibited in suitable habitat, such as wind or solar energy development. If the proposal is an activity that is specific prohibited, the submitter would be informed that the proposal is being rejected since it would not be consistent with the Land Use Plan, regardless of the design of the project.

In addition to consistency with program allocations, the Land Use Plan identifies a limit on the amount of disturbance that is allowed within a 'biological significant unit' (BSU). If current disturbance within the affected unit exceeds this threshold, the project should be deferred until such time as the amount of disturbance within the area has been reduced, through restoration or other management actions.

J.3.4 Step 3

In reviewing a proposal, determine if the project will have a direct or indirect impact on population or habitat (PPH or PGH). This can be done by:

1. Reviewing Greater Sage-Grouse Habitat maps.
2. Reviewing the 'Base Line Environment Report' (USGS) which identifies the area of direct and indirect effects for various anthropogenic activities.
3. Consultation with agency, Fish and Wildlife Service, or State Agency wildlife biologist.
4. Reviewing the standard and guidelines in the plan amendments (such as buffer distances for the proposed activity).
5. Other methods

If the proposal will not have a direct or indirect impact on either the habitat or population, proceed with the appropriate process for review, decision, and implementation of the project.

J.3.5 Step 4

If the project could have a direct or indirect impact of sage-grouse habitat or population, evaluate whether the proposal can be relocated so as to not have the indirect or direct impact and still achieve the intent of the proposal. This Step does not consider redesign of the project as a means of not having direct or indirect impacts but rather authorization of the project in a physical location that will not impact Greater Sage-grouse. If the project can be relocated so as to not have an impact on sage-grouse and still achieve objectives of the proposal, inform applicant and proceed with the appropriate process for review, decision, and implementation of the relocated project.

J.3.6 Step 5

If the preliminary review of the proposal concludes that there may be impacts to sage-grouse habitat and/or population, and the project cannot be effectively relocated to eliminate these impacts; evaluate whether the agency has the authority to modify or deny the project. If the agency does NOT have the discretionary authority to modify or deny the proposal, proceed with the authorization process (NEPA) and include appropriate mitigation requirements that avoid, minimize, or compensate for impacts to sage-grouse habitat and/or populations. Mitigations could include a combination of actions such as timing of disturbance, design modifications of the proposal, site disturbance restoration, and compensatory mitigation actions.

J.3.7 Step 6

If the agency has the discretionary authority to deny the project and after careful screening of the proposal (Steps 1-4) has determined that direct and indirect impacts cannot be eliminated, evaluate the proposal to determine if the adverse impacts can be reduced, minimized or compensated. If the impacts cannot be effectively reduced, minimized or compensated within the BSU, reject or defer the proposal. The criteria for determining this situation would include but not limited to:

- Natural disturbance within the BSU is significant and additional activities within the area would adversely impact the species.
- The current trend within the BSU is down and additional impacts, whether mitigated or not, could lead to further decline of the species or habitat.
- The proposed compensatory mitigation has proven to be ineffective or is unproven is terms of science based approach.
- The additional impacts, after applying effective compensatory mitigation, would exceed the disturbance threshold for the BSU.
- The project would impact habitat that has been determined, through monitoring, to be a limiting factor for species sustainability within the BSU.
- Other site specific criteria that determined the project would lead to a downward trend to the current species population or habitat with the BSU.

If compensatory mitigation can be applied to provide for a net conservation benefit to the species, proceed with the design of the compensatory mitigation plan and authorization (NEPA) of the Project. The authorization process could identify issues that may require additional mitigation or denial/deferring of the project based on site specific impacts to the Greater Sage-grouse.

Appendix DD

Buffers

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DD. Buffers

Applying Lek Buffer-Distances When Approving Actions

- *Buffer Distances and Evaluation of Impacts to Leks*

  Evaluate impacts to leks from actions requiring NEPA analysis. In addition to any other relevant information determined to be appropriate (e.g. State wildlife agency plans), the BLM will assess and address impacts from the following activities using the lek buffer-distances as identified in the USGS Report *Conservation Buffer Distance Estimates for Greater Sage-Grouse – A Review* (Open File Report 2014-1239). The BLM will apply the lek buffer-distances specified as the lower end of the interpreted range in the report unless justifiable departures are determined to be appropriate (see below). The lower end of the interpreted range of the lek buffer-distances is as follows:

  - linear features (roads) within 3.1 miles of leks
  - infrastructure related to energy development within 3.1 miles of leks.
  - tall structures (e.g., communication or transmission towers, transmission lines) within 2 miles of leks.
  - low structures (e.g., fences, rangeland structures) within1.2 miles of leks.
  - surface disturbance (continuing human activities that alter or remove the natural vegetation) within 3.1 miles of leks.
  - noise and related disruptive activities including those that do not result in habitat loss (e.g., motorized recreational events) at least 0.25 miles from leks.

  Justifiable departures to decrease or increase from these distances, based on local data, best available science, landscape features, and other existing protections (e.g., land use allocations, state regulations) may be appropriate for determining activity impacts. The USGS report recognized "that because of variation in populations, habitats, development patterns, social context, and other factors, for a particular disturbance type, there is no single distance that is an appropriate buffer for all populations and habitats across the sage-grouse range". The USGS report also states that "various protection measures have been developed and implemented… [which have] the ability (alone or in concert with others) to protect important habitats, sustain populations, and support multiple-use demands for public lands". All variations in lek buffer-distances will require appropriate analysis and disclosure as part of activity authorization.

  In determining lek locations, the BLM will use the most recent active or occupied lek data available from the state wildlife agency.

- *For Actions in GHMA*

  The BLM will apply the lek buffer-distances identified above as required conservation measures to fully address the impacts to leks as identified in the NEPA analysis. Impacts should first be avoided by locating the action outside of the applicable lek buffer – distance(s) identified above.

  The BLM may approve actions in GHMA that are within the applicable lek buffer distance identified above only if:

  - Impacts should first be avoided by locating the action outside of the applicable lek buffer-distance(s) identified above.
  - If it is not possible to relocate the project outside of the applicable lek buffer-distance(s) identified above, the BLM may approve the project only if:
    - Based on best available science, landscape features, and other existing protections, (e.g., land use allocations, state regulations), the BLM determines that a lek buffer-distance other than the applicable distance identified above offers the same or a greater level of protection to GRSG and its habitat, including conservation of seasonal habitat outside of the analyzed buffer area; or
    - The BLM determines that impacts to GRSG and its habitat are minimized such that the project will cause minor or no new disturbance (ex. co-location with existing authorizations); and
    - Any residual impacts within the lek buffer-distances are addressed through compensatory mitigation measures sufficient to ensure a net conservation gain, as outlined in the Mitigation Strategy (Appendix X).

- *For Actions in PHMA & IHMA*

  The BLM will apply the lek buffer-distances identified above as required conservation measures to fully address the impacts to leks as identified in the NEPA analysis. Impacts should be avoided by locating the action outside of the applicable lek buffer-distance(s) identified above.

  The BLM may approve actions in PHMA and IMHA that are within the applicable lek buffer distance identified above only if:

  - The BLM, with input from the state fish and wildlife agency, determines, based on best available science, landscape features, and other existing protections, that a buffer distance other than the distance identified above offers the same or greater level of protection to GRSG and its habitat, including conservation of seasonal habitat outside of the analyzed buffer area.

- Range improvements which do not impact GRSG, or, range improvements which provide a conservation benefit to GRSG such as fences for protecting important seasonal habitats, meet the lek buffer requirement.
- The BLM will explain its justification for determining the approved buffer distances meet these conditions in its project decision.

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