

From: [Skye Kimel](#)
To: [managethefuture](#); [Patti Adair](#); [Phil Chang](#); [Tony DeBone](#)
Subject: Landfill Site Final Decision
Date: Thursday, March 7, 2024 7:56:27 AM

[EXTERNAL EMAIL]

Hello,

As you near the final decision for the location of the new landfill, I would like to take another opportunity to beg you to choose the Moon Pit over the Roth East site. The moon pit is an already heavily disturbed site as opposed to the relatively pristine rangeland of the Roth East site. Reading the analysis of the sites, it seems that the decision will largely come down to money as the Roth East site is a much more objectionable site for various reasons. I do appreciate all of the work put in and the honest assessment of the places. I ask that you please, please, please choose to preserve our open spaces by choosing the moon pit site. As a lifelong Oregonian, (43 of my 45 years in Central Oregon) and a property owner in Millican, I truly hope that Deschutes County can set a precedent of trying to preserve our open spaces, dark skies, wildlife habitat, sagebrush grasslands, room to breathe and recreate to the best of your ability. We, as Central Oregonians, have seen so much change in the last decades and I am hoping that seeing a landfill as you drive out into the open rangeland east of Bend is not one of them.

In Arizona last year, I happened upon a landfill positioned far outside of Phoenix in the desert. It was a jarring site in the midst of the otherwise pristine desert. It was surrounded by netting to keep the trash in but trash on the roadside increased as you neared the landfill. I understand that we all make trash and we need a place to dispose of it, but please put it in an already disturbed site.

P.S. In your final analysis of the sites, I didn't see any reference to Pine Mountain Observatory in reference to the Roth East Site. I believe there were fairly significant requests made by them to ensure that the skies remain clear for their work? Dust and light being the main concerns?

Thank you for your consideration,

Skye and Jacob Kimel
Redmond, OR
Millican, OR

From: [Tim Brownell](#)
To: [Mark Salvo](#)
Cc: [Ryan Houston](#); [managethefuture](#)
Subject: RE: ONDA Analysis and Recommendations for Deschutes County Landfill Siting
Date: Thursday, March 14, 2024 9:05:50 AM
Attachments: [image009.png](#)
[image010.png](#)
[image011.png](#)
[image012.png](#)

Mark,

Thank you for providing me and the department with ONDA's preliminary assessment of the impacts of the potential development of a new landfill. I appreciate the work you and your organization has put into it and we will both review it and include it as part of the public record of the process. We will also make it available to the SWAC and Board of County Commissioners as well during this process.

We will get back with you with any questions or comments of our own after we have had a chance to review it, and may reach out to you to discuss further.

Thanks,

Tim



Tim Brownell | Director

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From: Mark Salvo <msalvo@onda.org>
Sent: Thursday, March 14, 2024 8:53 AM
To: Tim Brownell <Tim.Brownell@deschutes.org>
Cc: Ryan Houston <rhouston@onda.org>
Subject: ONDA Analysis and Recommendations for Deschutes County Landfill Siting

[EXTERNAL EMAIL]

Hello Tim,

ONDA has prepared a brief analysis of potential impacts of developing and operating a landfill on natural resources at either of the two locations remaining in Deschutes County's current decisionmaking process (attached). It is likely incomplete, but provided lots of helpful

maps and citation to relevant science and applicable federal and state planning and policy. We found that siting a landfill at either Moon Pit or Roth East would have deleterious impacts on sage-grouse and other wildlife, including several species of conservation concern; wilderness values; and public use and recreation on public lands. As I have no experience in state land use law, I didn't attempt to describe how proposed development at either location could also contravene state land use Goal 5 and its implementing regulations.

I hope this analysis will be useful to your department and the Solid Waste Advisory Committee. ONDA will attend the SWAC meeting next week to offer our thoughts on the two remaining sites for a future landfill. We look forward to working with the county to make the best possible decision for locating a future landfill.

Mark

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Mark Salvo ([he/him](#))
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Oregon Natural Desert Association

Analysis of Impacts of from Potential Future Solid Waste Facility on Wildlife and Wilderness in Deschutes County, Oregon

March 13, 2024

Summary

The Deschutes County Department of Solid Waste’s public process for identifying sites for a future solid waste facility in the county has settled on two potential locations east of the city of Bend: Moon Pit and Roth East.

Development and operation of either site would have deleterious impacts on greater sage-grouse (*Centrocercus urophasianus*).

Landfill development and operation at Moon Pit or Roth East would also affect a host of other native wildlife species, including pronghorn (*Antilocapra americana*), mule deer (*Odocoileus hemionus*), Rocky Mountain elk (*Cervus canadensis roosevelti*), golden eagle (*Aquila chrysaetos*) and prairie falcon (*Falco mexicanus*).

Developing the Moon Pit site would also impact wilderness values and recreation in the Oregon Badlands Wilderness and the Horse Ridge Recreation Area.

While the range and intensity of impacts to wildlife, wilderness and recreation would differ between the two locations, development at Moon Pit may be less harmful to these values and resources than at Roth East, assuming implementation of a full suite of compensatory conservation measures.

Regardless of which site may be chosen, planning and management cannot fully mitigate impacts on wildlife, wilderness or recreation from siting a landfill at either Moon Pit or Roth East.

Compensatory Conservation Measures

Development and operation of a solid waste facility at the Moon Pit or Roth East site must include a comprehensive wildlife mitigation plan and secure, continuous, independent funding that:

- Preserves greater sage-grouse (“sage-grouse”) habitat through acquisition of private properties and conservation easements at an ecologically meaningful scale within the Brothers Priority Area for Conservation.
- Enhances and restores sage-grouse habitat quality within the Brothers Priority Area for Conservation through active and passive restoration techniques, including voluntary grazing permit retirement on federal public lands; collaboration with local landowners and organizations to seed native forb and grass species; fence removal, retrofitting and/or marking; elimination of unnecessary anthropogenic features and structures on private and public lands; and eradication of invasive plant species.

- Provides and maintains essential habitat for pronghorn, and winter habitat for mule deer and Rocky Mountain elk, including through closure and reclamation of two-track vehicle routes, fence removal and wildlife-friendly fence construction and retrofitting.
- Marks wildlife crossings over highways and roads to be used by trucks and other vehicles accessing the landfill.
- Incorporates design features for buildings and other infrastructure that deter raven roosting and prevent electrocution of raptors, including golden eagle.
- Retrofits transmission poles at an ecologically meaningful scale to prevent electrocution of raptors in the region.
- Surveys, monitors, and controls invasive plant species at the landfill facility.
- Avoids or minimizes the impacts of noise, light and fencing at the landfill facility on wildlife.

In addition to the above measures, mitigation for developing and operating a solid waste facility at the Moon Pit site must:

- Incorporate design features at the facility and supporting infrastructure to reduce visual, audial and olfactory impacts of the landfill on wilderness values and visitation to the Oregon Badlands Wilderness and Horse Ridge Recreation Area.
- Support organizations and programs to maintain and improve wilderness values and recreational experiences in the Oregon Badlands Wilderness and Horse Ridge Recreation Area.

Analysis

Deschutes County’s process for selecting a future site for a solid waste facility has reduced the list of potential sites to two locations: Moon Pit and Roth East. Both sites are privately owned, but surrounded by federal public lands and state lands, including specially designated areas. *See* Map 1 (“Landfill Options, Land Ownership, and Designated Areas”). The Moon Pit site is located directly adjacent to the Oregon Badlands Wilderness. *See* Map 2 (“Proposed Moon Pit Landfill Site and Oregon Badlands Wilderness”).

Greater Sage-Grouse

Both potential landfill sites are within or in close proximity to designated sage-grouse habitats. In its newly revised maps, the Oregon Department of Fish and Wildlife (“ODFW”) expanded the local Brothers Priority Area for Conservation (e.g., “core” habitat) for sage-grouse, including westward toward the two potential landfill sites, in recognition of the importance of this region to recovery of the species. *See* Map 3 (“Landfill Options, Sage-Grouse Leks, and Core, Low Density Habitats”). The Bureau of Land Management has similarly designated priority and general habitats near and overlapping (Roth East) the two sites. *See* Map 4 (“Landfill Options,

Sage-Grouse Leks, and Priority, General Habitats”). These habitat designations are the foundation of the federal government’s unprecedented, rangewide conservation strategy for sage-grouse. Finally, as part of a comprehensive reinventory of sagebrush habitats in the West, the U.S. Geological Survey (“USGS”) identified core habitats and habitat growth opportunity areas on and around both potential landfill sites (Doherty *et al.* 2022). *See* Map 5 (“Landfill Options and Sagebrush Core Habitat, Growth Opportunity Areas”). The new USGS maps were specifically created to support a “spatially explicit conservation design” to inform ongoing federal planning and conservation of sage-grouse.

The Roth East site is within sage-grouse summer habitat. *See* Map 6 (“Landfill Options, Sage-Grouse Leks, and Summer Habitat”). High quality, late brooding-rearing (summer) habitats—used from July through September—are key to maintaining viable sage-grouse populations. The forbs and associated insect diversity at these sites are essential for the development and survival of juvenile sage-grouse (Gregg and Crawford 2009; Drut *et al.* 1994). Late brood-rearing habitats are often considered a population-limiting habitat type due to their strong influence on chick survival, and by extension, population growth (Taylor *et al.* 2012; Dahlgren *et al.* 2016; Street 2020). Within the Great Basin, research estimates that late brood-rearing habitats comprise less than 2 percent of sage-grouse habitats (Atamian *et al.* 2010).

The Roth East site is also within sage-grouse winter habitat. *See* Map 7 (“Landfill Options, Sage-Grouse Leks, and Winter Habitat”). High quality, accessible winter habitat is also essential to the sage-grouse’s life cycle. Sage-grouse winter habitat must provide tall, healthy sagebrush for food and cover to support the birds throughout the season (Braun *et al.* 2005; Connelly *et al.* 2011a, *citing others*). Big sagebrush communities typically used for winter habitat are also becoming increasingly rare in the West (Welch 2005). Given the importance of winter habitat, the loss or fragmentation of these areas can have a disproportionate impact on sage-grouse population size locally and regionally (Caudill *et al.* 2013; Oregon 2013 DEIS: 8-39).

The state of Oregon ranks sage-grouse winter habitat as “Category 1” essential wildlife habitat (Hagen 2011: 83), noting that “[w]inter habitat is critical to the persistence of the species, and currently there are no studies or methods for restoring or creating winter habitat if it is lost” (Hagen 2011: 83, internal citations omitted). The state defines Category 1 habitat as “...irreplaceable, essential habitat for a fish or wildlife species, population, or a unique assemblage of species and is limited on either a physiographic province or site-specific basis, depending on the individual species, population or unique assemblage” (OAR 635-415-0025(1)). State regulation seeks to prevent the loss of quantity or quality of Category 1 habitat (OAR 635-415-0025(1)(a)) by recommending or requiring:

- (A) Avoidance of impacts through alternatives to the proposed development action; or
- (B) No authorization of the proposed development action if impacts cannot be avoided.

Development of either Roth East or Moon Pit would negatively affect sage-grouse, although putting a landfill at Roth East would have far greater impacts on the species given its proximity to sage-grouse leks and designated habitat areas. Sage-grouse are highly sensitive to habitat loss, degradation and fragmentation, including from development of facilities and infrastructure (Knick and Connelly 2011; SGNTT 2011). Further, sage-grouse have low tolerance to

disturbance from anthropogenic activity, such as light, noise, human presence, and motorized vehicle travel. Impacts from development such as a landfill can extend for tens of miles, affecting sage-grouse breeding, nesting, brood-rearing, and movement at regional scales.

Sage-grouse are identified as “sensitive” by the Bureau of Land Management (BLM 2021) and a “Species of Greatest Conservation Need” (“SGCN”) by the state of Oregon (ODFW 2016). The species requires large, intact, interconnected areas of sagebrush steppe (Connelly *et al.* 2011b). Developing and implementing conservation strategies at regional or landscape scales will have the greatest benefit for sage-grouse and their habitat (*see* Doherty *et al.* 2011). Haphazard conservation of small and disconnected habitat patches will not benefit the species.

Importantly, anthropogenic changes in land use, such as development of roads, transmission lines, and landfills, have benefitted ravens by providing additional food sources and roosting locations particularly in winter, allowing for their increased distribution and abundance (Coates *et al.* 2020; Peebles and Conover 2017). Although sage-grouse are preyed on by a variety of species, ravens (*Corvus corax*) are responsible for the most nest depredation, contributing significantly to the decline of sage-grouse populations in the last century (Conover and Roberts 2017; Peebles and Conover 2017). Coates *et al.* (2020) found that proximity to developed areas exhibits the strongest influence on raven density in landscapes throughout the Great Basin and Peebles *et al.* (2017) determined ravens exert the most damage to landscapes within a 40-km radius of landfills where they wintered. Further, Coates *et al.* (2020) estimated that increased raven populations and distribution throughout the Great Basin are already affecting “at least 64% of the most important breeding concentration areas for sage-grouse” and mapped the central Oregon area among some of the highest levels of currently predicted raven density (emphasis added). There are dozens of leks within 40-km of both potential landfill sites, significantly increasing the vulnerability of sage-grouse nests to depredation by ravens with corollary declines in local sage-grouse populations. *See* Map 8 (“Landfill Options, Sage-Grouse Leks, and Raven Damage Zones”).

The Roth East site also poses an additional and unique threat to sage-grouse. The Nature Conservancy, using circuitscape connectivity analysis, mapped least-cost/most conducive pathways for sage-grouse to move between leks in Oregon (Jones *et al.* 2015). Roth East is located directly in the circuitscape pathway mapped between leks east and west of that site. *See* Map 9 (“Landfill Options, Sage-Grouse Leks, and Circuitscape Connectivity”). Development of that location would almost certainly affect the species’ movement through that area and could lead to abandonment of the three active leks west of the site.

Given the impacts described above, Deschutes County would be required to commit to and implement extensive habitat mitigation measures to meet the state of Oregon’s regulated standard for compensatory mitigation for conserving sage-grouse, especially for Roth East:

The standard for compensatory mitigation of direct and indirect habitat impacts in sage-grouse habitat (core, low density, and general areas) is to *achieve net conservation benefit for sage-grouse by replacing the lost functionality of the impacted habitat to a level capable of supporting greater sage-grouse numbers than that of the habitat which was*

impacted. Where mitigation actions occur in existing sage-grouse habitat, the increased functionality must be in addition to any existing functionality of the habitat to support sage-grouse (OAR 635-140-0025 (3), emphasis added).

Regulations implementing Oregon land use Goal 5 specifically define a solid waste facility as a “large-scale development” (OAR 660-023-0115(3)(i)(D)), which are *per se* a “conflicting use” (OAR 660-023-0115(3)(a)) with conserving “significant sage-grouse habitat,” which includes state-mapped sage-grouse core and low-density habitats (OAR 660-023-0115(6)) (Map 3). The state has prescribed a robust program for counties to administer to avoid, minimize and mitigate otherwise incompatible development to support sage-grouse conservation objectives (OAR 660-023-0115).¹

Mule Deer, Rocky Mountain Elk, Pronghorn

Both potential landfill locations are also within or near mule deer and Rocky Mountain elk winter range, as well as “essential” habitat for pronghorn, which includes habitat that, “if diminished in quality or quantity, would result in depletion of the species” (ODFW 2021). *See* Map 10 (“Landfill Options and Mule Deer Winter Range”); Map 11 (“Landfill Options and Elk Winter Range”); Map 12 (“Landfill Options and Pronghorn Essential Habitat”). Winter range is vital to mule deer survival, providing both refuge and high-quality forage over the winter months that is necessary for successful reproduction and survival, particularly when deer are nutritionally stressed. ODFW “consider[s winter range] seasonally critical...[d]ue to its limited nature on the landscape” (ODFW 2024). Anthropogenic barriers, such as fencing and roadways, and human activity can fragment habitats and disrupt, block, or alter ungulate movement across the landscape, limiting wildlife connectivity (Pew 2022). Notably, the mule deer population in the Paulina unit has remained far below the management objective (“MO”) in the past five years, which was censused at 24% of the MO.²

Importantly, the state of Oregon ranks both pronghorn “essential” habitat and mule deer and elk winter range as “Category 2” wildlife habitat (ODFW 2021, ODFW 2013). The state defines Category 2 habitat as “essential habitat for a fish or wildlife species, population, or unique assemblage of species and is limited either on a physiographic province or site-specific basis depending on the individual species, population or unique assemblage” (OAR 635-415-0025(2)).

The state’s mitigation goal for Category 2 habitat, in case impacts are unavoidable, is “no net loss of either habitat quantity or quality and to provide a net benefit of habitat quantity or

¹ With the exception of this mention of state land use Goal 5 and associated regulations, this analysis does not attempt to delve deeper into the likely application of state land use law to siting a potential landfill at Moon Pit or Roth East.

² *See* ODFW, Mule Deer population estimates, herd composition, and over-winter fawn survival in Oregon 2019 - 2023,

https://www.dfw.state.or.us/resources/hunting/big_game/controlled_hunts/docs/hunt_statistics/23/Mule%20Deer%20Population%20Estimates,%20Composition,%20and%20Over-Winter%20Fawn%20Survival%202019%20-%202023.pdf (last accessed Jan. 5, 2024).

quality” (OAR 635-415-0025(2)(a)). State regulation seeks to prevent the loss of quantity or quality of Category 2 habitat (OAR 635-415-0025(2)(b)) by recommending or requiring:

- (A) Avoidance of impacts through alternatives to the proposed development action; or
- (B) Mitigation of impacts, if unavoidable, through reliable in-kind, in-proximity habitat mitigation to achieve no net loss of either pre-development habitat quantity or quality. In addition, a net benefit of habitat quantity or quality must be provided. Progress towards achieving the mitigation goals and standards shall be reported on a schedule agreed to in the mitigation plan performance measures. The fish and wildlife mitigation measures shall be implemented and completed either prior to or concurrent with the development action.

If neither habitat Category 2 mitigation measure (A) or (B) can be achieved, ODFW is directed in regulation to recommend against or not authorize the proposed development action (OAR 635-415-0025(2)(c)).

Habitat Connectivity

ODFW has recently mapped a network of Priority Wildlife Connectivity Areas (“PWCAs”) statewide. This legislatively directed, statewide collaborative effort examined the “habitat associations and requirements, movement capabilities and limitations, and responses to different types of stressors” of 54 surrogate wildlife species throughout the state to identify “good quality habitat in intact, relatively undisturbed parts of the landscape, as well as the best remaining marginal habitat to help wildlife navigate through developed or degraded areas” (ODFW 2023). Connected landscapes provide access to forage, water sources, and shelter throughout different life stages and seasonal movements that is crucial for species survival and reproduction while also aiding in adaptation to changes in land use from development, wildfire, nonnative species invasion, and climate change and drought conditions.

These newly identified PWCAs support ODFW’s goal to “[p]rovide connectivity of habitat for the broad array of wildlife species throughout Oregon,” addressing one of the “Key Conservation Issues” outlined in the federally reviewed and approved *Oregon Conservation Strategy*, which guides ODFW’s efforts in conserving and recovering Species of Greatest Conservation Need throughout the state (ODFW 2016). Additionally, PWCAs serve as a useful guide in land management decisions to prevent further landscape fragmentation in Oregon where increasing threats from management and development “have compromised the integrity and connectivity of wildlife populations and their habitats.” *Id.*

PWCAs are comprised of Regions (highest value habitat in large, contiguous areas), Connectors (corridors between Regions along optimal pathways), and Steppingstones (small areas of intact habitat that help facilitate movement in urban areas). Both potential landfill sites would overlap Connectors linking Regions, while development of the Roth East site would also affect a Region itself. *See* Map 13 (“Landfill Options and Wildlife Habitat Connectivity”). The concurrence of these sites with habitat areas that support special status species or specially designated habitats—such as prioritized sage-grouse habitats, crucial mule deer winter range, and pronghorn essential habitat—underscores where management, including a precautionary approach to habitat

disturbance, would be most beneficial to wildlife and support shared conservation goals (ODFW 2023).

Golden Eagle, Other Raptors

Golden eagle and other raptors occur near both potential landfill sites. There are 6 golden eagle nests located within a 5km² proximity (the mean core breeding area of golden eagles in latitudes between 40-50°) of the Moon Pit location. *See* Map 14 (“Proposed Moon Pit Landfill Site, Golden Eagle Nests, and Mean Core Breeding Habitat”). Mean core breeding areas are the most heavily utilized areas within an eagle’s home range that contain the most dependable food sources and alternative nesting locations (Hansen *et al.* 2017). Of the currently mapped nests, the closest is approximately 1.4 miles from the Moon Pit site. Additionally, the Roth East site falls within a mean core breeding area for one golden eagle nest. *See* Map 15 (“Landfill Options, Golden Eagle Nests, and Mean Core Breeding Areas”). Golden eagles are sensitive to anthropogenic noise and changes in land use—both from “infrequent or short-term disturbance” and “chronic or long-term disturbance” (Hansen *et al.* 2017). These effects may impact nesting success. *Id.* Furthermore, additional transmission lines erected throughout the area may increase the rate of take from electrocution, which currently accounts for approximately 500 golden eagle deaths each year (USFWS 2016). The golden eagle is protected under the Bald and Golden Eagle Protection Act, 16 U.S.C. §§ 668-668c, and the Migratory Bird Treaty Act, 16 U.S.C. §§ 703–712, from human activities that disturb or adversely impact the birds’ ability to “forage, nest, roost, breed, or raise young” (USFWS 2007).

Notably, the Bureau of Land Management also specially manages Dry River Canyon, where golden eagles nest and forage, for conservation of prairie falcon. This species is also protected under the Migratory Bird Treaty Act. Development and operation of a landfill at Moon Pit should study and seek to avoid potential impacts prairie falcon.

Other Wildlife

Development of either site should also consider potential impacts to bat populations within the project vicinity, which are sensitive to habitat alteration, specifically the impacts of noise and light that can affect foraging, navigation, roost emergence, and juvenile growth (Cory-Toussaint and Taylor 2022). There are seven bat species identified as SGCN in the Northern Basin and Range ecoregion in Oregon, the distribution of which are not fully known (ODFW 2016). Bats are especially vulnerable to anthropogenic influences—such as loss of habitat, exposure to light, and prolonged noise—and particularly at roosting sites (Gervais 2016, Gruver and Keinath 2006, Keinath 2004). The county should consult ODFW to determine the presence, habitat needs, and what design features should be incorporated in landfill construction to mitigate impacts to bats.

Wilderness Values, Recreation

Established by Congress in 2009, Oregon Badlands Wilderness is 29,000 acres and a cherished landscape for Deschutes County residents seeking quiet recreation and moments of solitude. The Moon Pit site is adjacent to the wilderness area and across Highway 20 from the Horse Ridge

Recreation Area. The Bureau of Land Management is currently planning more trails, facilities and parking to accommodate burgeoning public use of the recreation area.³ Siting a landfill at Moon Pit would affect public enjoyment of both the wilderness and recreation area.

Maps

- Map 1. Landfill Options, Land Ownership, and Designated Areas
- Map 2. Proposed Moon Pit Landfill Site and Oregon Badlands Wilderness
- Map 3. Landfill Options, Sage-Grouse Leks, and Core, Low Density Habitats
- Map 4. Landfill Options, Sage-Grouse Leks, and Priority, General Habitats
- Map 5. Landfill Options and Sagebrush Core Habitat, Growth Opportunity Areas
- Map 6. Landfill Options, Sage-Grouse Leks, and Summer Habitat
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- Map 8. Landfill Options, Sage-Grouse Leks, and Raven Damage Zones
- Map 9. Landfill Options, Sage-Grouse Leks, and Circuitscape Connectivity
- Map 10. Landfill Options and Mule Deer Winter Range
- Map 11. Landfill Options and Elk Winter Range
- Map 12. Landfill Options and Pronghorn Essential Habitat
- Map 13. Landfill Options and Wildlife Habitat Connectivity
- Map 14. Proposed Moon Pit Landfill Site, Golden Eagle Nests, and Mean Core Breeding Habitat
- Map 15. Landfill Options, Golden Eagle Nests, and Mean Core Breeding Areas

³ See Horse Ridge Recreation Management Area Project, <https://eplanning.blm.gov/eplanning-ui/project/2030546/510>.

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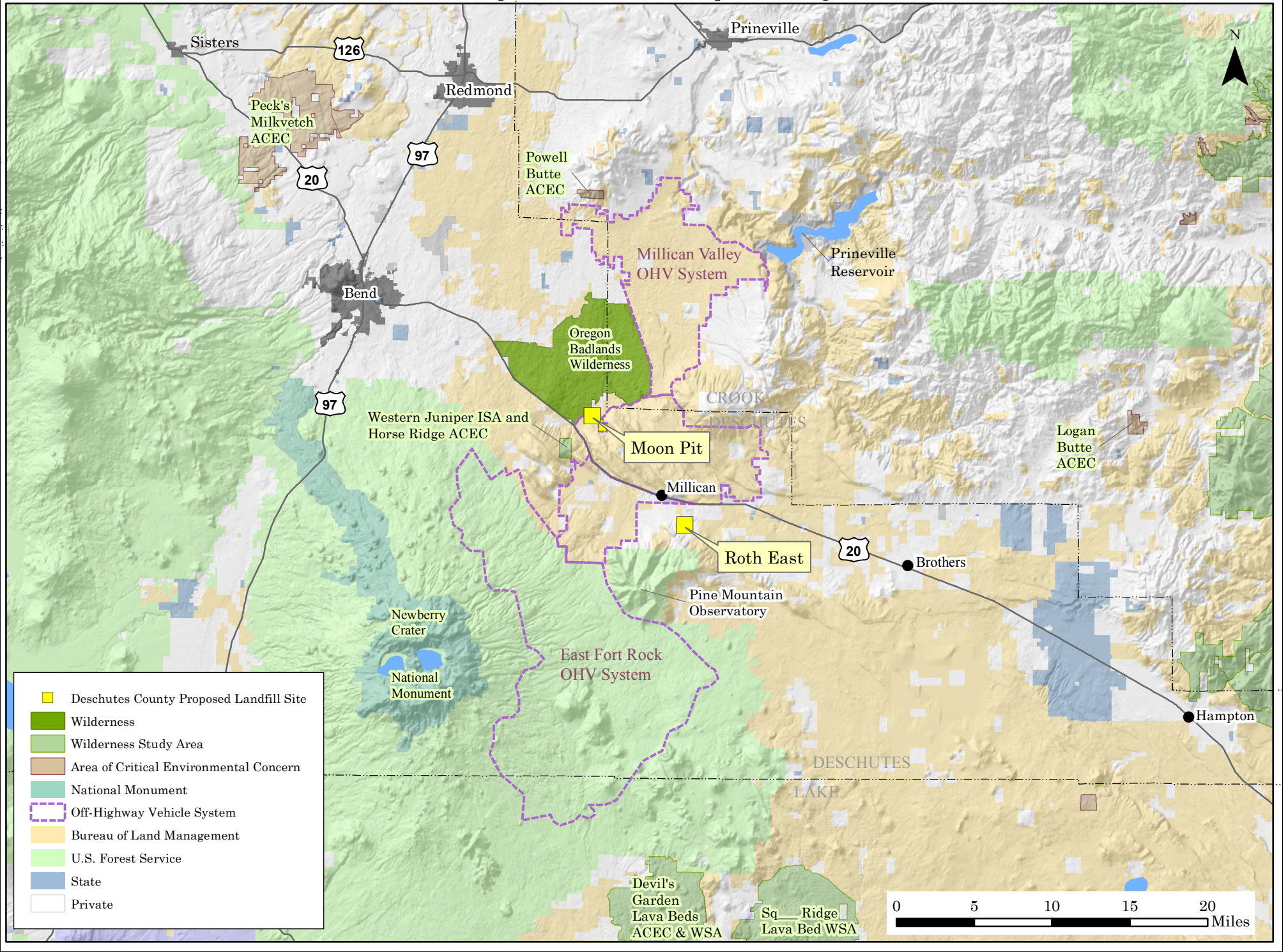
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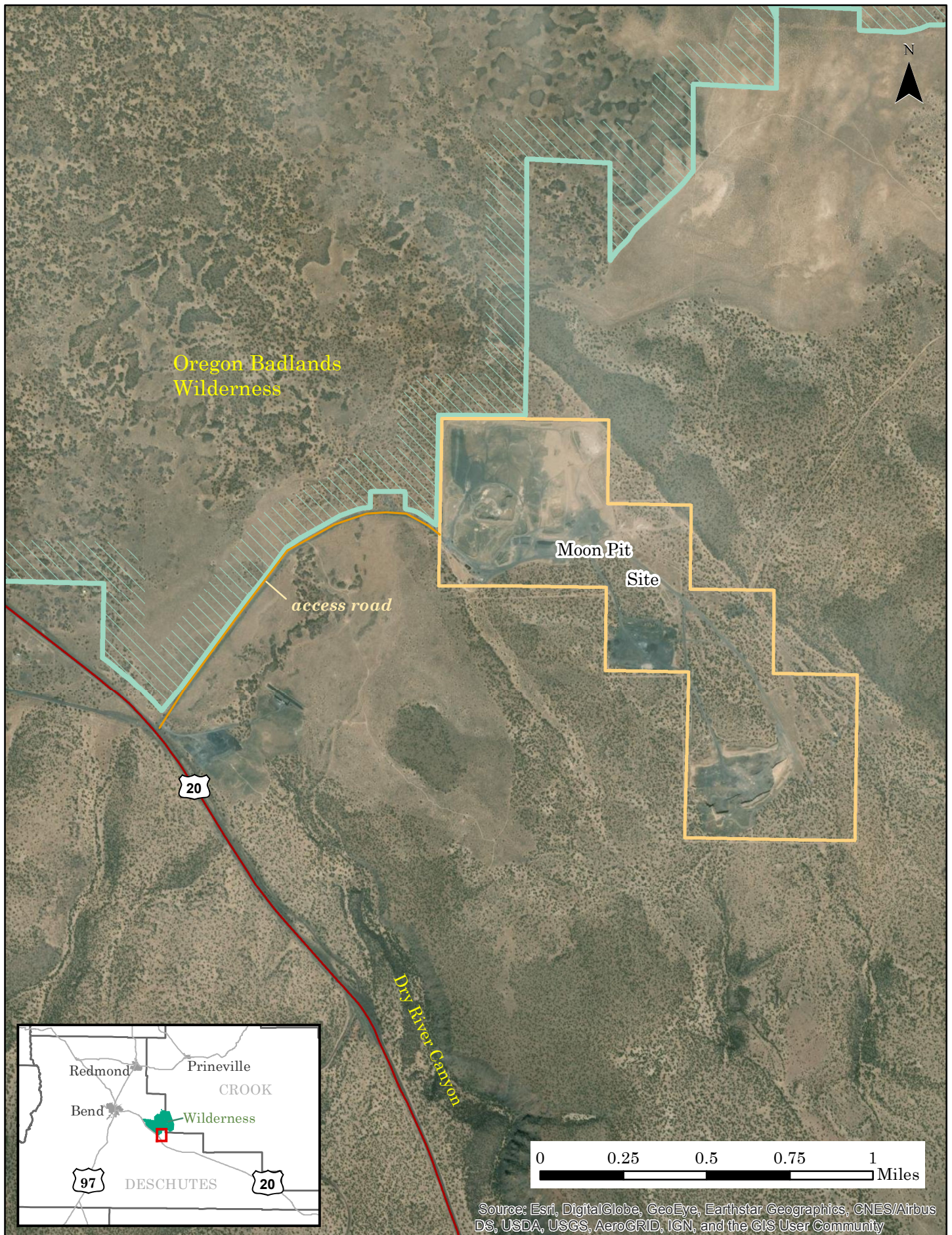
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Map 1. Landfill Options, Land Ownership, and Designated Areas

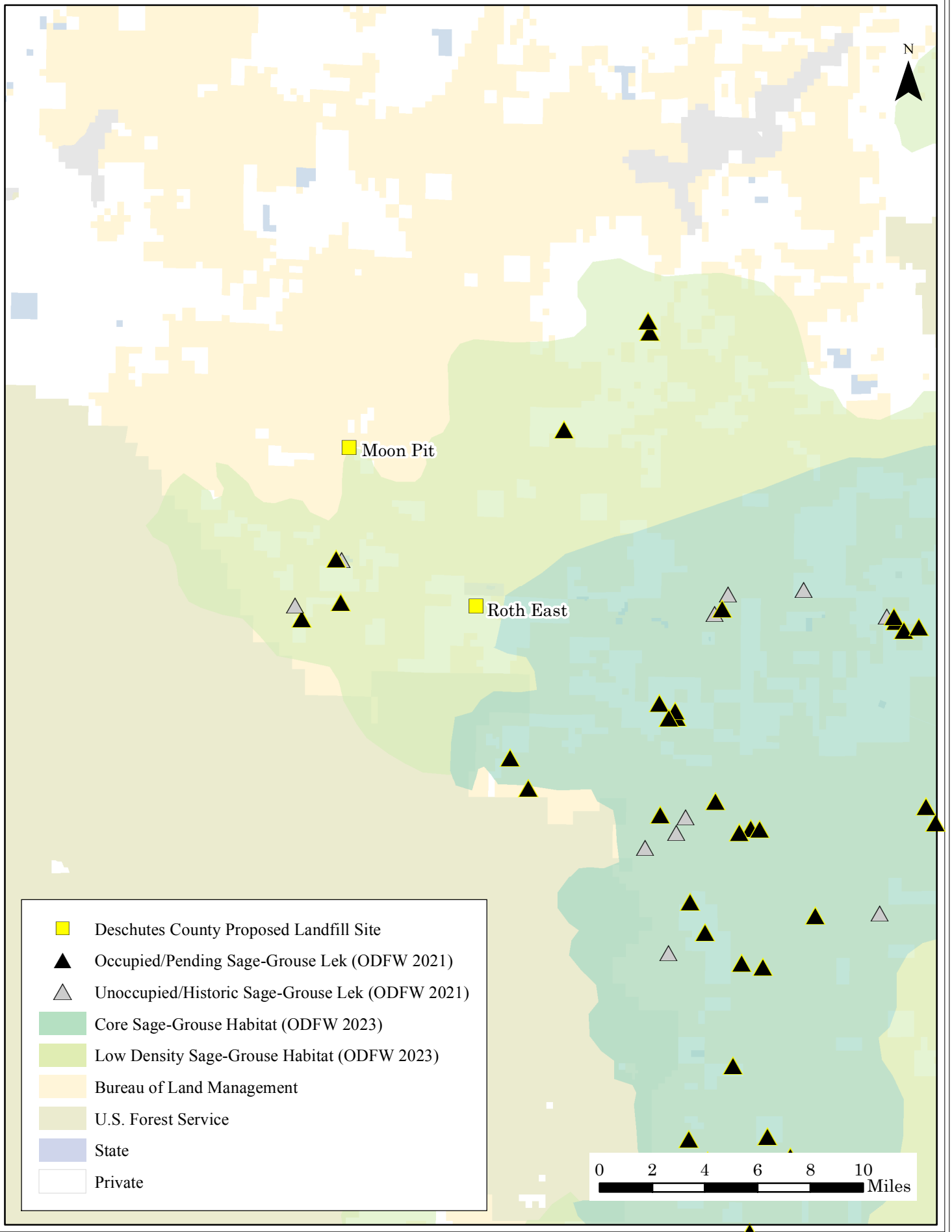


Map 2. Proposed Moon Pit Landfill Site and Oregon Badlands Wilderness



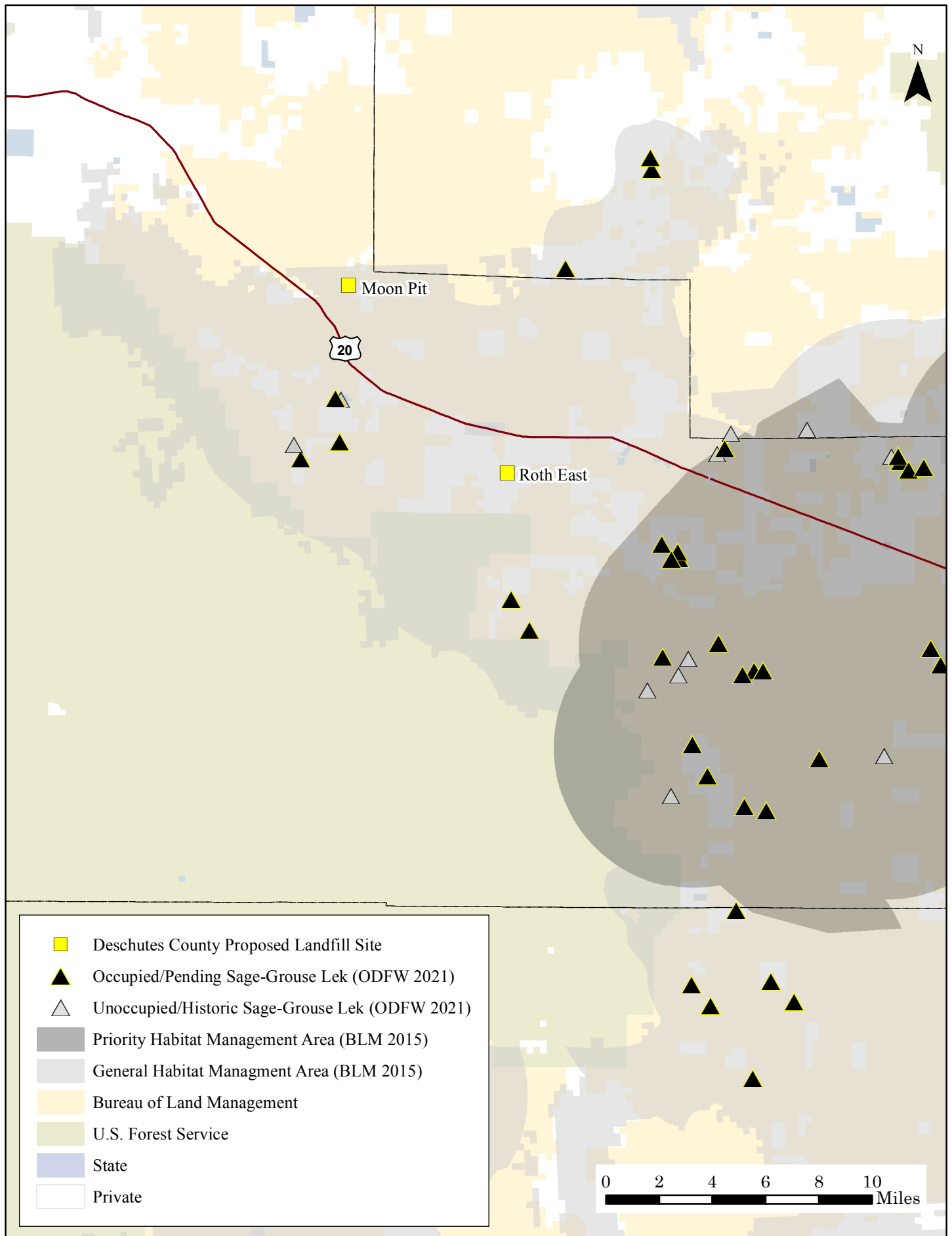
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Map 3. Landfill Options, Sage-Grouse Leks, and Core, Low Density Habitats

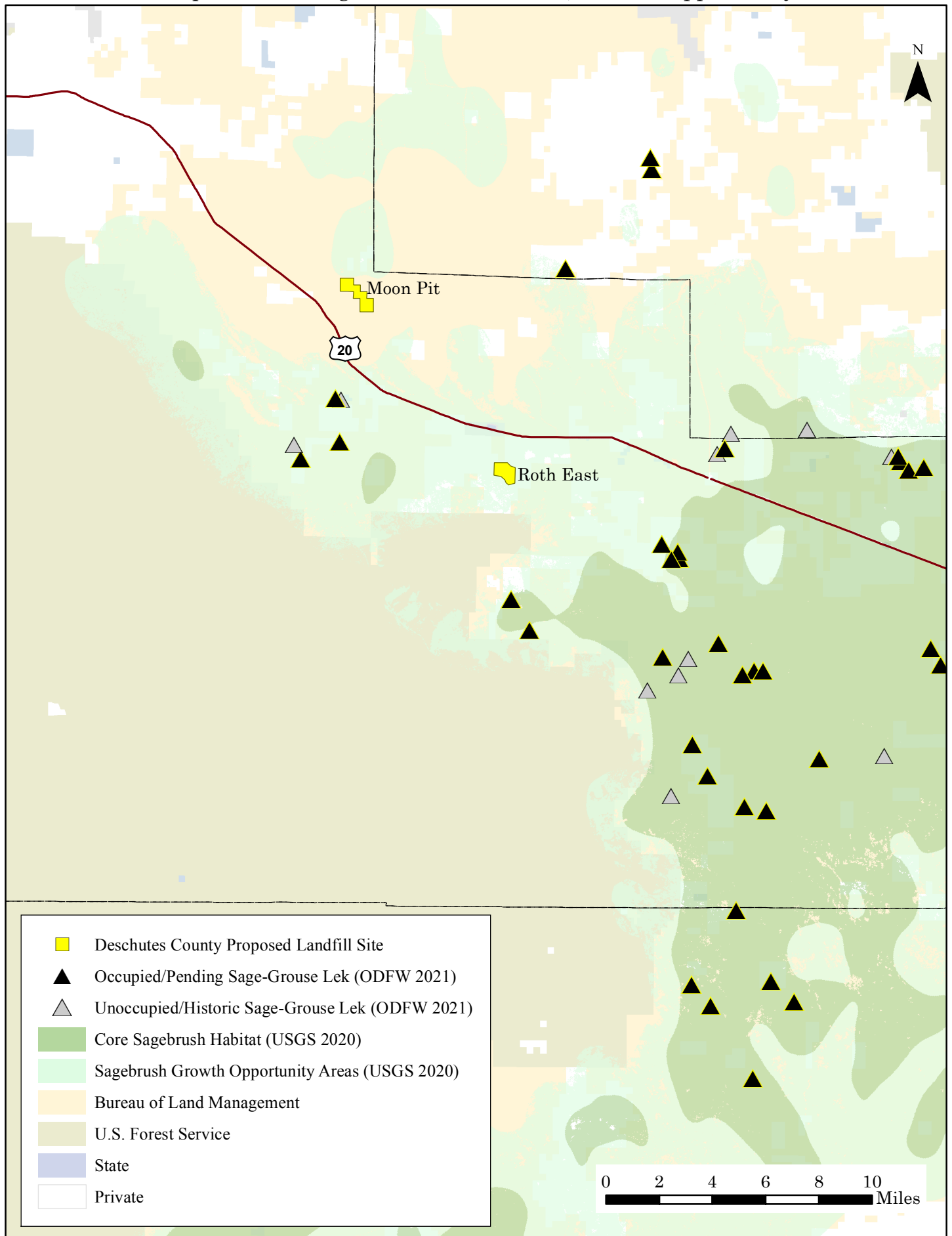


Map 4.

Landfill Options, Sage-Grouse Leks, and Priority, General Habitats

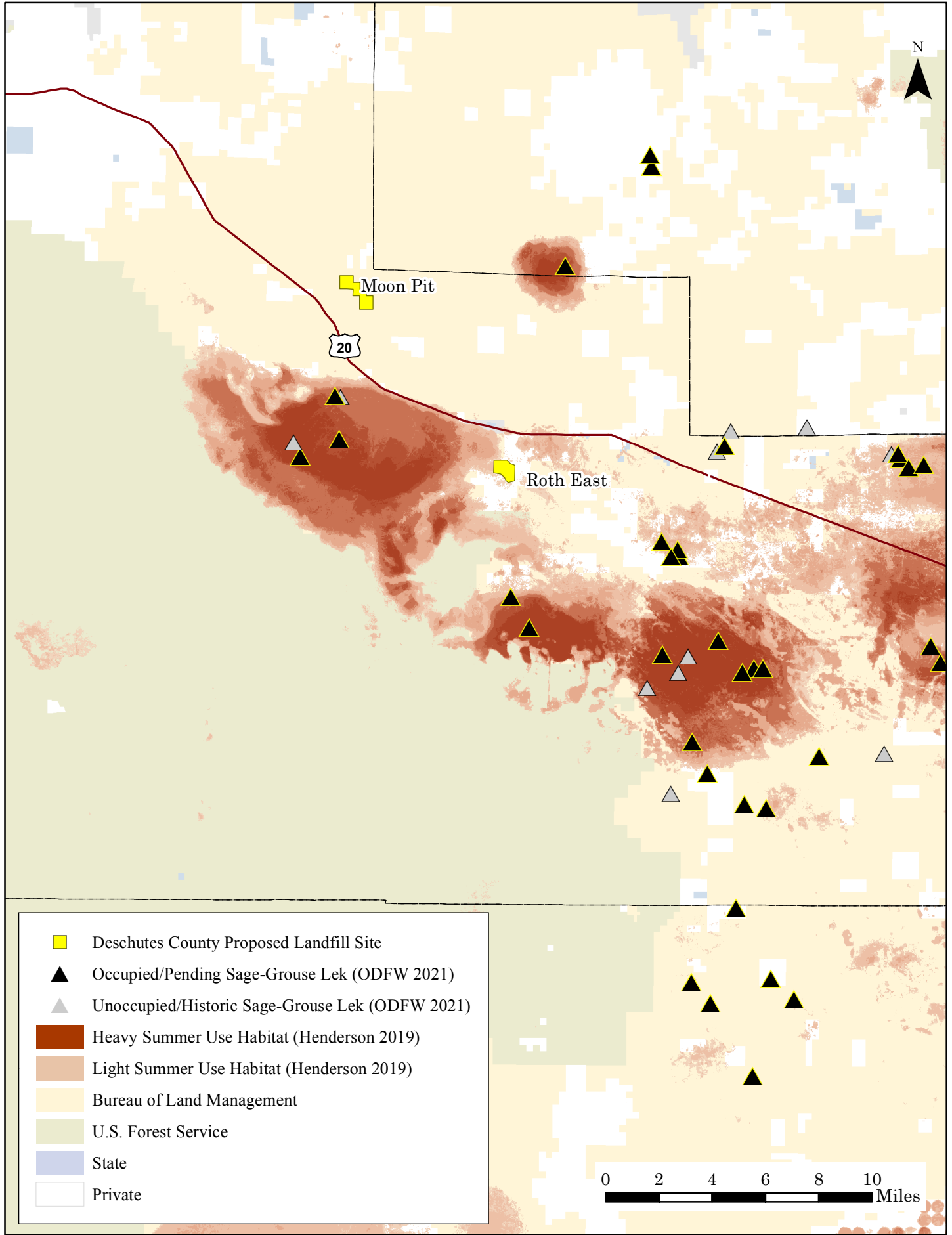


Map 5. Landfill Options and Sagebrush Core Habitat, Growth Opportunity Areas



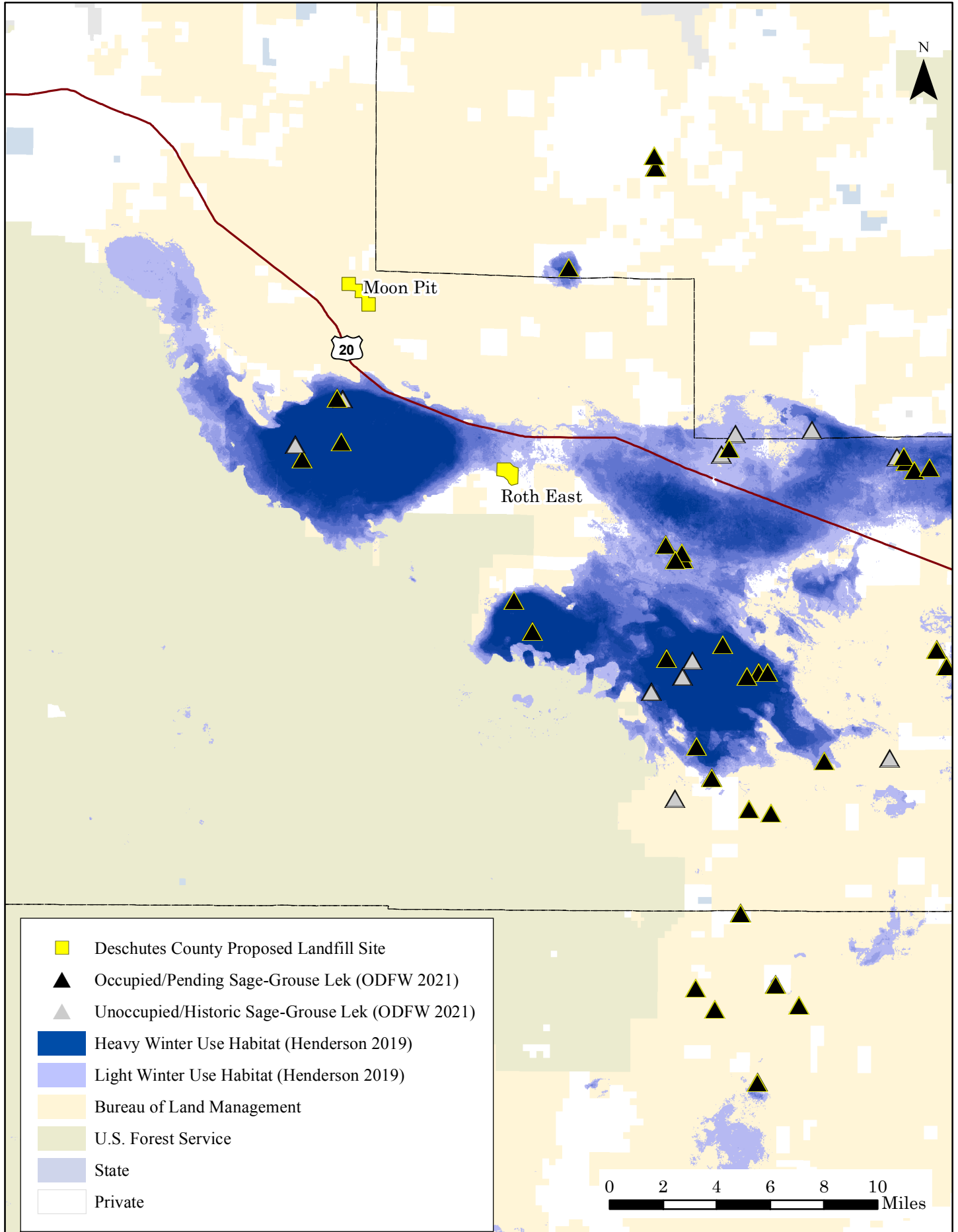
Map 6.

Landfill Options, Sage-Grouse Leks, and Summer Habitat



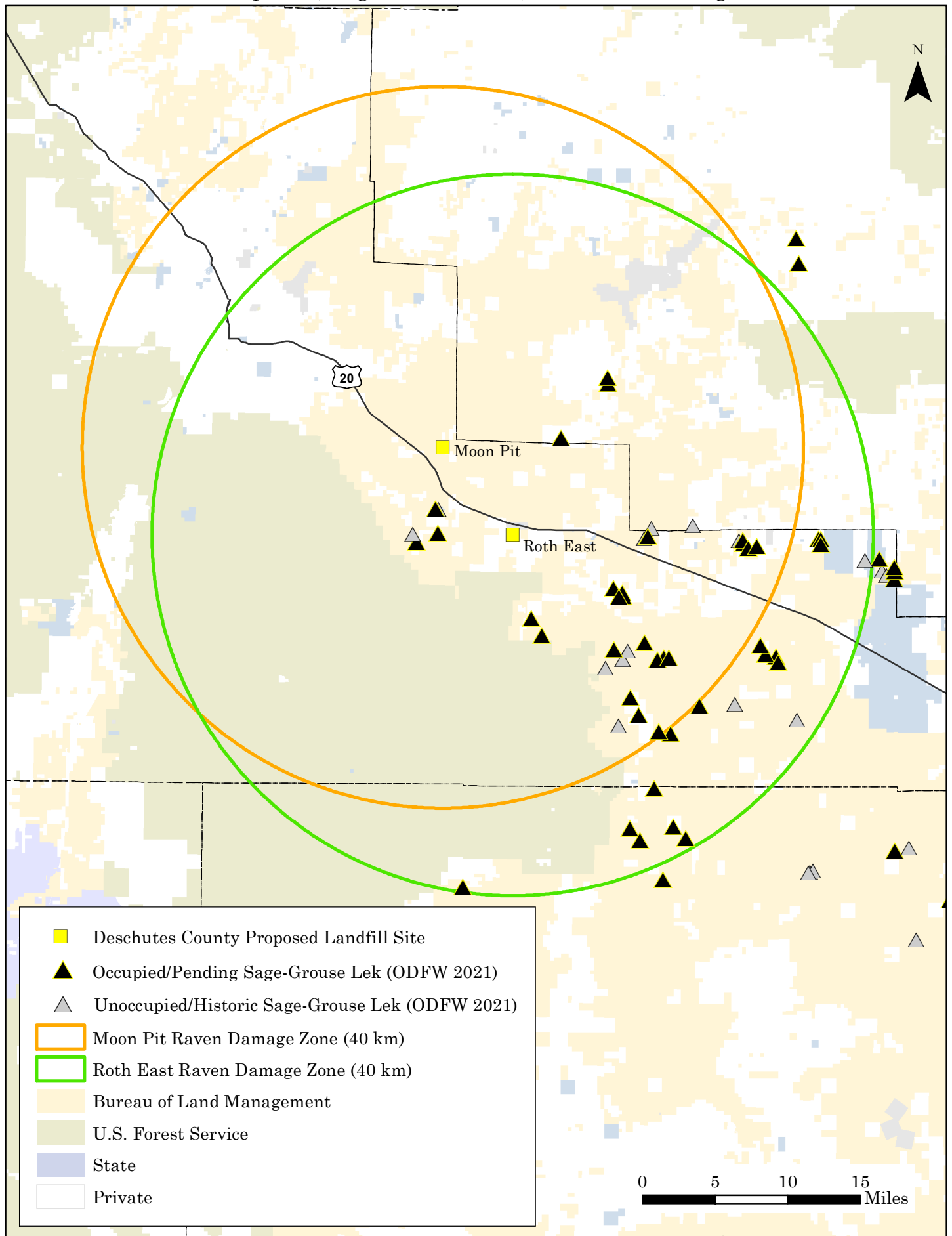
Map 7.

Landfill Options, Sage-Grouse Leks, and Winter Habitat

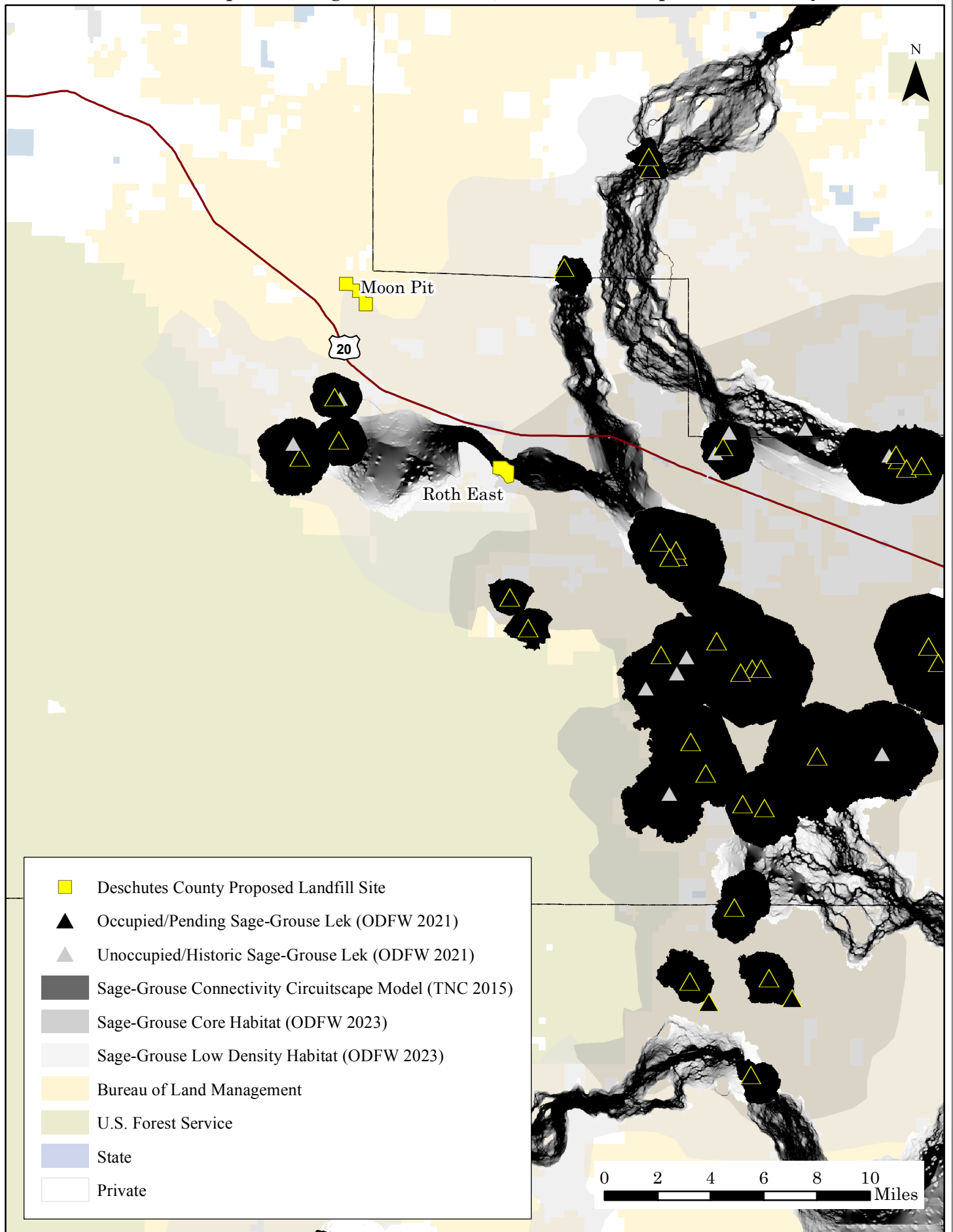


Map 8.

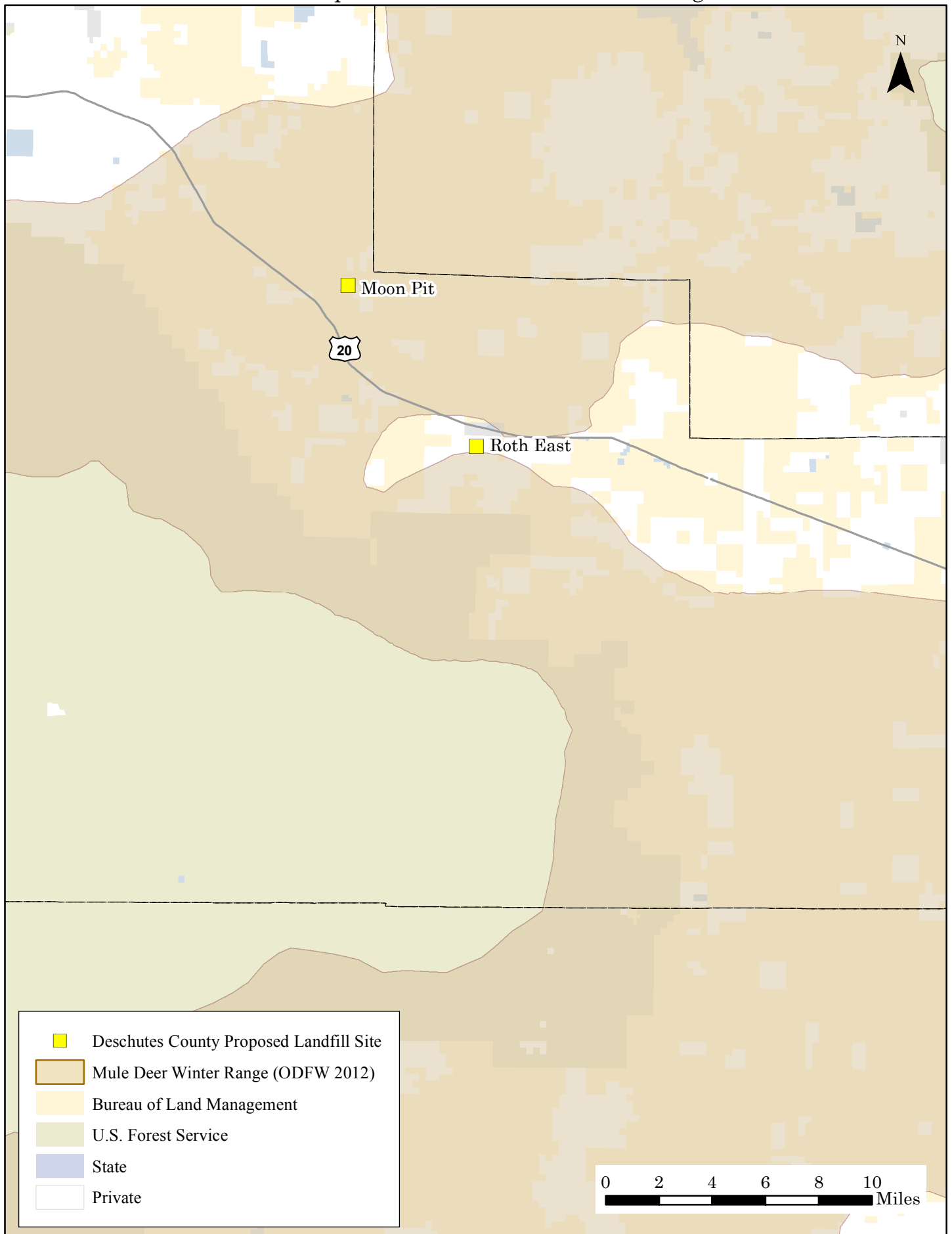
Landfill Options, Sage-Grouse Leks, and Raven Damage Zones



Map 9. Landfill Options, Sage-Grouse Leks, and Circuitscape Connectivity



Landfill Options and Mule Deer Winter Range



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■ Moon Pit

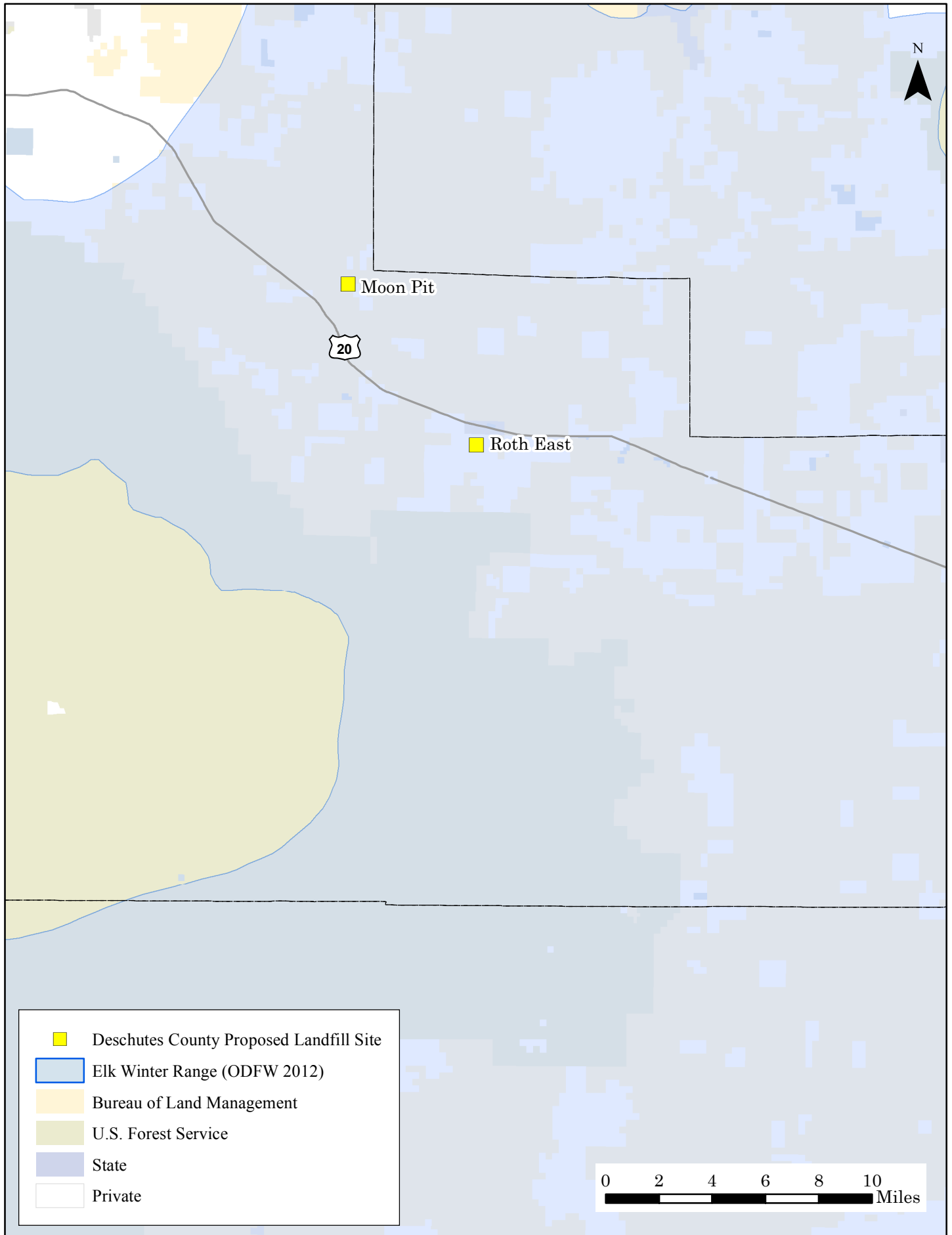
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■ Roth East

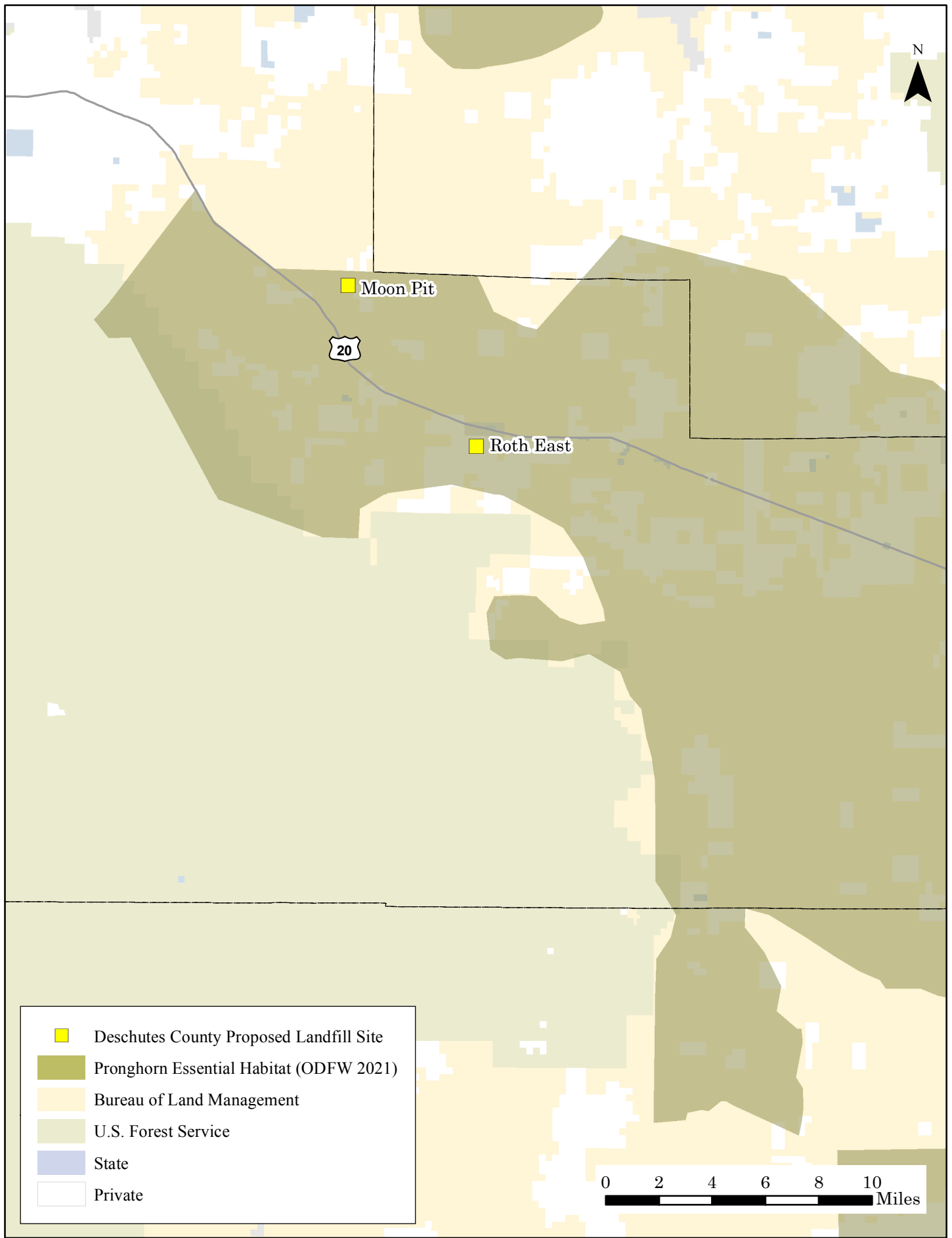
- Deschutes County Proposed Landfill Site
- Mule Deer Winter Range (ODFW 2012)
- Bureau of Land Management
- U.S. Forest Service
- State
- Private

0 2 4 6 8 10 Miles

Landfill Options and Elk Winter Range

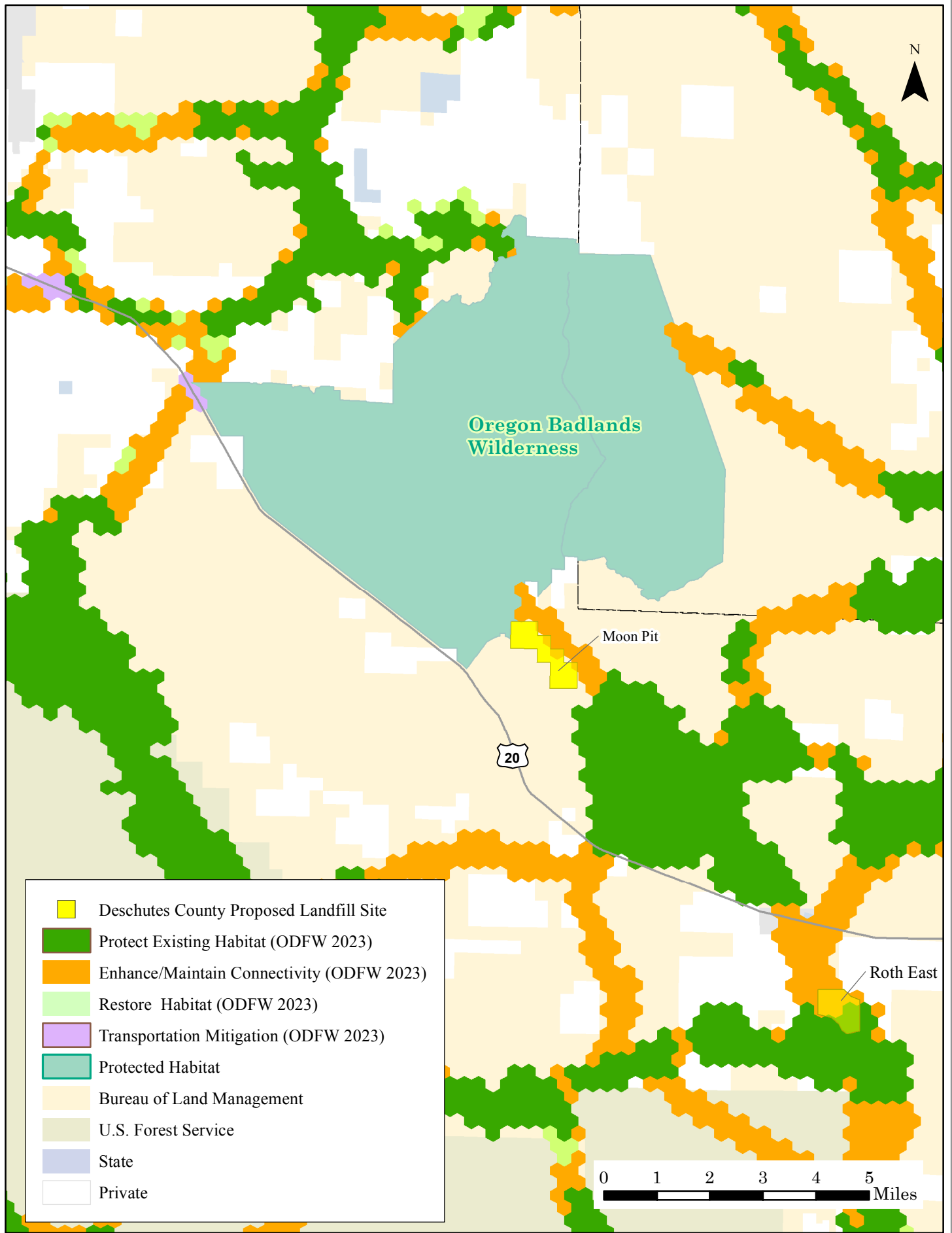


Landfill Options and Pronghorn Essential Habitat

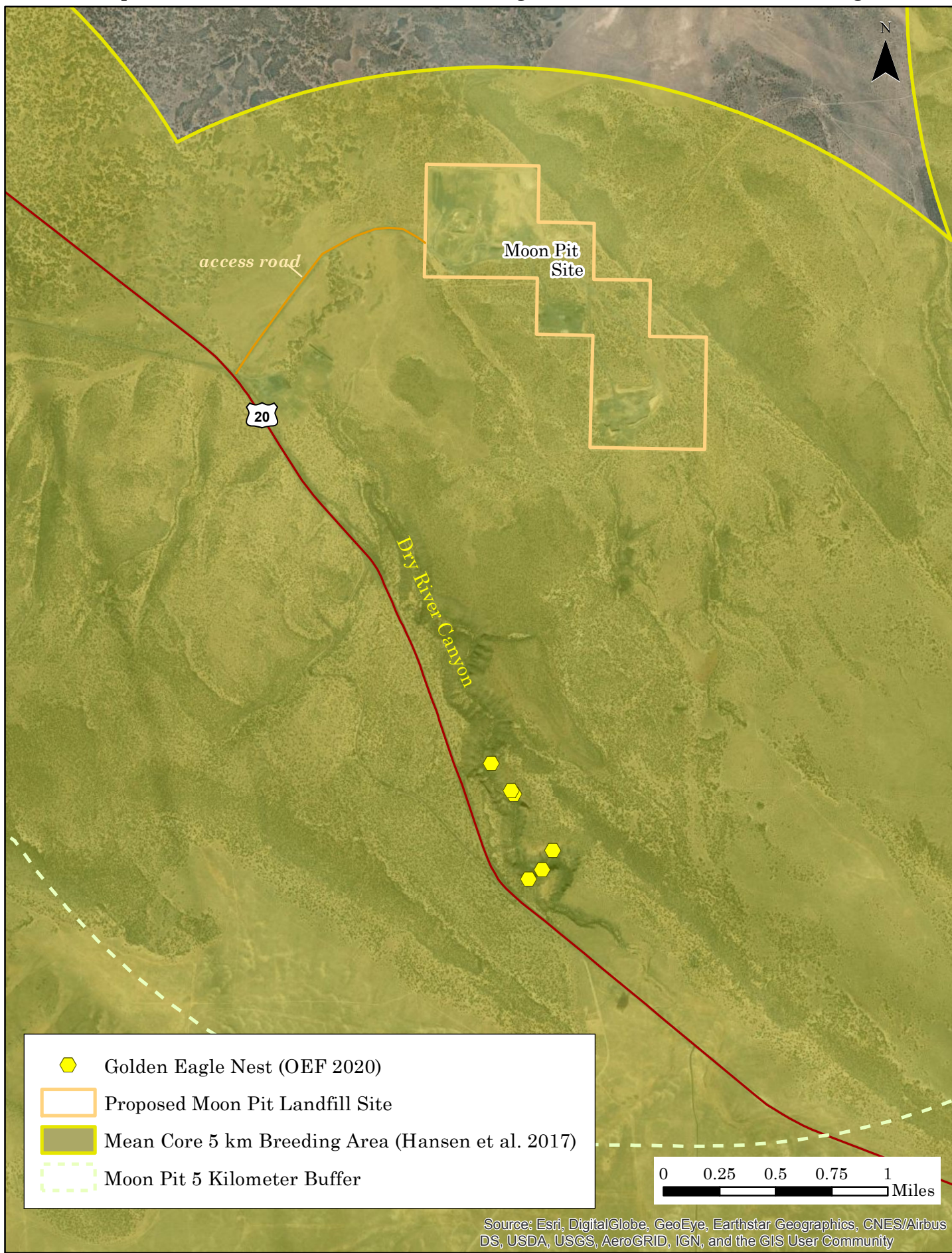


Map 13.

Landfill Options and Wildlife Habitat Connectivity



Map 14. Proposed Moon Pit Landfill Site, Golden Eagle Nests, and Mean Core Breeding Habitat



Map 15. Landfill Options, Golden Eagle Nests, and Mean Core Breeding Areas

