

Final Programmatic Environmental Assessment

Former Bennett Freeze Area Integrated Resource Management Plan



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The data provided for this analysis were made available either by accessing open-source data repositories or provided voluntarily by government and tribal agencies. Cultural resource and other confidential data were not made available for this analysis. While the data used in this document come from official sources and were believed to be the best available at the time, data in Indian Country can be less accurate than in other areas.

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ACRONYMS AND ABBREVIATIONS

AIARMA	American Indian Agricultural Resources Management Act
ALUP	Agricultural Land Use Permits
ARMP	Agricultural Resource Management Plans
AUM	abandoned uranium mines
BIA	Bureau of Indian Affairs
BMP	best management practice
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CLUP	Community Land Use Plans
CO	carbon monoxide
CWA	Clean Water Act
DGC	District Grazing Committee
EA	Environmental Assessment
ESA	Endangered Species Act
FBF DGC	Former Bennett Freeze District Grazing Committee
FBFA	Former Bennett Freeze Area
FR	Federal Register
ID	interdisciplinary
IRMP	Integrated Resource Management Plan
kV	kilovolt
LMD	Land Management District
MOU	Memorandum of Understanding
msl	mean sea level
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NESL	Navajo Endangered Species List
NHLC	Navajo-Hopi Land Commission
NHPA	National Historic Preservation Act
NNC	Navajo Nation Code
NNDFW	Navajo Nation Department Fish and Wildlife
NNDWR	Navajo Nation Department of Water Resources
NNEPA	Navajo Nation Environmental Protection Agency
NNHP	Navajo Natural Heritage Program
NO ₂	nitrogen dioxide
NRCS	Natural Resource Conservation Service
NRO	Navajo Regional Office
O ₃	ozone
Pb	lead
PEA	Programmatic Environmental Assessment
PL	Public Law
PM ₁₀	particulate matter up to 10 micrometers in size
PM _{2.5}	particulate matter up to 2.5 micrometers in size
RMP	Range Management Plan
ROW	right-of-way
SO ₂	sulfur dioxide
SUYL	Sheep Unit Year Long
TCP	Traditional Cultural Properties

US	United States
USACE	US Army Corps of Engineers
USC	United States Code
USDA	US Department of Agriculture
USEPA	US Environmental Protection Agency
USFWS	US Fish and Wildlife Service

1. Summary of the Proposed Action

1.1 Background

In 1966, the Commissioner of Indian Affairs, Robert Bennett, issued a series of administrative orders that restricted development on 1.6 million acres of tribal lands in northeastern Arizona. This became known as the Bennett Freeze and was intended to be a temporary measure until a dispute over the lands between the Navajo Nation and Hopi Tribe was settled. In 2006, Navajo and Hopi leaders signed an Intergovernmental Compact, which a federal court approved in 2007, that lifted the Bennett Freeze, clarified the boundaries of the two reservations in Arizona, and ensured access to religious sites of both Tribes. Nine Chapters of the Navajo Nation were impacted by the 40-year Freeze, which all but stopped development in the area and contributed to poor living conditions for many residents.

The proposed federal action is the adoption of an Integrated Resource Management Plan (IRMP) for the Former Bennett Freeze Area (FBFA) as prepared by the Bureau of Indian Affairs (BIA) Navajo Regional Office (NRO) and the Navajo Nation. The Navajo Nation Division of Community Development, Design, and Engineering Services obtained funding and led the development of the Recovery Plan for the FBFA, which was completed in 2008. The IRMP was prepared to update the 2008 Recovery Plan and was developed with assistance from the FBFA interdisciplinary Task Force and Core Teams comprising representatives from the BIA and the Navajo Nation. On November 21, 2015, the Navajo Nation and BIA signed a Memorandum of Understanding (MOU), electing to finalize the development of the FBFA IRMP in partnership with the BIA in accordance with American Indian Agricultural Resource Management Act (AIARMA) (25 United States Code [USC] Chapter 39).

The AIARMA defines an IRMP as a “plan developed pursuant to the process used by tribal governments to assess available resources and to provide identified holistic management objectives that include quality of life, production goals, and landscape descriptions of all designated resources that may include (but not be limited to) water, fish, wildlife, forestry, agriculture, minerals, and recreation, as well as community and municipal resources, and may include any previously adopted tribal codes and plans related to such resources.” (25 USC § 3703(11)). Under the AIARMA “development and management of Indian agricultural lands in accordance with integrated resource management plans will ensure proper management of Indian agricultural lands and will produce increased economic returns, enhance Indian self-determination, promote employment opportunities, and improve the social and economic well-being of Indian and surrounding communities.” (25 USC § 3701(4)).

The FBFA IRMP is the Tribe's strategic plan for the management and development of its own resources. The IRMP would serve as a basis for future resource decision-making. The planning process is designed to incorporate all pertinent information into one document to guide the future management of an area or resource. The IRMP sets comprehensive goals for the FBFA, establishes desirable use levels, and identifies types of development and land uses.

This Programmatic Environmental Assessment (PEA) was prepared to thoroughly examine the potential environmental impacts of the proposed action and alternative actions in order to support informed decision-making. This PEA is consistent with the purpose and goals of the National Environmental Policy Act of 1969 (NEPA), 42 USC § 4321 et seq.; the requirements of the Council on Environmental Quality's

(CEQ) implementing NEPA regulations at 40 CFR Parts 1500-1508 (promulgated September 14, 2020); longstanding federal judicial and regulatory interpretations; the Department of the Interior’s NEPA regulations (43 CFR Part 46); the Indian Affairs NEPA Guidebook, 59 IAM 3-H (BIA August 2012); and Administration priorities and policies including Secretary’s Order No. 3399 requiring bureaus and offices to use “the same application or level of NEPA that would have been applied to a proposed action before the 2020 Rule went into effect.”

This PEA incorporates by reference the information in the FBFA Draft IRMP (NNDNR/BIA 2020). This information incorporated includes more detailed baseline data used to describe the affected environment such as soils characteristics, vegetation types, and water sources, among others.

1.2 Purpose and Need for Action

The proposed federal action is the adoption of the IRMP for the FBFA prepared by the BIA NRO and Navajo Nation. The purpose of the IRMP is to meet the social, cultural, economic, and long-term sustainability needs of the residents of the FBFA. The IRMP is a strategic, vision-based, long-range management plan based on Navajo Nation members’ interests, needs, and concerns for their lands, and natural and cultural resources.

The need for the action is the BIA’s responsibilities for the management of Indian agricultural lands under the AIARMA. “The BIA is responsible for conducting all land management activities on Indian agricultural land in accordance with goals and objectives set forth in the approved agricultural resource management plan, in an integrated resource management plan, and in accordance with all tribal laws and ordinances...” (25 USC § 3712(a)). Land management activities include but are not limited to:

- preparation of soil and range inventories, farmland and rangeland management plans, and monitoring programs to evaluate management plans
- soil and range conservation management techniques
- integrated pest management programs to control noxious weed or agricultural pests
- administration and supervision of agricultural leasing and permitting activities, including determination of proper land use, carrying capacities, and proper stocking rates of livestock, appraisal, advertisement, negotiation, contract preparation, collecting, recording, and distributing lease rental receipts
- technical assistance to individuals and tribes engaged in agricultural production or agribusiness; and
- educational assistance in agriculture, natural resources, land management and related fields of study, including direct assistance to tribally controlled community colleges in developing and implementing curriculum for vocational, technical, and professional course work.

1.3 Land Involved in the Analysis

The FBFA encompasses over 1.6 million acres in the northeast corner of Arizona and forms the westernmost portion of the Navajo Nation (Appendix A, Map A-1). Nine Chapters are included within the FBFA boundary: (1) Bodaway-Gap, (2) Cameron, (3) Coalmine Canyon, (4) Coppermine, (5) Kaibeto, (6) Leupp, (7) Tolani Lake, (8) Tonalea, and (9) Tuba City. The Kaibeto Plateau borders the FBFA to the north, the Colorado River and Coconino Plateau to the west, the Painted Desert to the south, and the

Moenkopi Plateau to the east. The Little Colorado River traverses through the FBFA, starting in the south and meandering west and eventually meeting up with the Colorado River at the confluence along the western border of the FBFA.

1.4 Scoping and Public Involvement

1.4.1 Community Input Received during the IRMP Planning Process

Community input was received, compiled, and considered from multiple sources.

1. Community Land Use Plans (CLUPs) from all nine affected Chapters
 - a) Overview of IRMP on November 13, 2014, Tuba City Chapter, Tuba City, Arizona.
 - b) Coalmine Canyon Chapter House Meeting March 9, 2016, Coalmine Canyon, Arizona.
 - c) Workshop on March 16, 2016, in Tuba City to inform Chapter members on the IRMP and the IRMP process, Tuba City, Arizona.
2. 2008 Former Bennett Freeze Recovery Plan
 - a) Community members, youth, Chapter officials, and administration staff participated in two community workshops to develop the 2008 FBFA Recovery Plan from May 28 to June 22, 2008.
 - b) Community members, youth, tribal officials, and Chapter administration staff participated in two community workshops to update each CLUP.
3. 2018 Former Bennett Freeze Area Economic and Market Feasibility Study

CLUPs are prepared by a community-appointed committee and reflect community members' vision and goals with concern for the development and protection of Chapter lands. These plans serve as a strategic guide for Chapter administrators when considering development within their respective Chapter service areas. For the IRMP, these CLUPs were considered the most comprehensive collection of community-identified goals available and were extensively utilized in the planning process.

1.4.2 Scoping

CEQ regulations do not require a scoping process for a PEA but provide that “[a]gencies shall involve the public, State, Tribal, and local governments, relevant agencies, and any applicants, to the extent practicable in preparing environmental assessments” (40 CFR § 1501.5[e]). Similarly, Department of the Interior regulations implementing NEPA provides that bureaus “must, to the extent practicable, provide for public notification and public involvement when an environmental assessment is being prepared. However, the methods for providing public notification and opportunities for public involvement are at the [BIA's] discretion” (43 CFR § 46.305[a]). BIA, therefore, chose to include a scoping period to potentially identify new issues, capture the tribal membership's voice, and maximize opportunities for public input and participation in the PEA process.

Scoping activities included an opportunity for both tribal members and the non-tribal public to provide input on what should be studied, analyzed, and considered in drafting the PEA. The 45-day scoping

period began on November 16 and ended on December 30, 2020. The methods below were used to notify and inform interested parties.

A scoping fact sheet containing information on the Draft IRMP, the purpose and need for the action, NEPA planning process, the dates and times for the scoping meetings, and comment submittal information were sent to 50 addressees consisting of the nine affected chapters, individual stakeholders, business owners, and tribal and federal representatives and elected officials.

The BIA issued the press release on the project-specific website (<https://www.bia.gov/fbfa-ea>). The website became “live” with project information on November 16, 2020. The BIA social media platform on Facebook is <https://www.facebook.com/BureauIndAffrs/>. The Facebook page included information on the public meetings and became “live” on November 16, 2020. The press release was also published in the Navajo-Hopi Observer and Navajo Times between October 18 and November 26, 2020. Public service announcements in the Navajo language were broadcast on KUYI, out of Keams Canyon, Arizona, which covers the FBFA.

Individuals were provided several methods to share their comments with the BIA, including a project-specific email address and a facsimile number. Both the fact sheet and press release highlighted the opportunity to comment and the times and dates of the virtual scoping meetings.

Five 2-hour outreach meetings were convened during the scoping period. The meetings were conducted using webinars on the Zoom platform to adhere to COVID-19 pandemic Public Health Orders. Interested parties could also call into the meetings using a toll-free number. The meetings were held on:

- December 1, 2020, Tuesday, 10:00 a.m. to 12:00 p.m.
- December 1, 2020, Tuesday, 6:00 p.m. to 8:00 p.m.
- December 2, 2020, Wednesday, 10:00 a.m. to 12:00 p.m.
- December 3, 2020, Thursday, 10:00 a.m. to 12:00 p.m.
- December 3, 2020, Thursday, 4:00 p.m. to 6:00 p.m.

Under normal circumstances, the BIA would have conducted the public scoping meetings in person at four different locations within the FBFA. However, Public Health Orders restricted gatherings of more than five, and the Navajo Nation had been under daily curfews and weekend lockdowns since March 2020.

During the scoping period, the BIA received 13 comment submittals during the virtual meetings and via email. These submittals contained 26 individual comments. Following the close of the public scoping period, comments were compiled and analyzed to identify issues and concerns.

1.4.3 Draft Programmatic Environmental Assessment Public Comment Period

CEQ and Department of the Interior regulations do not require publication of a draft EA for public review and comment. However, Department of the Interior regulations provide that “[b]ureaus may seek comments on an environmental assessment if they determine it to be appropriate, such as when the level of public interest or the uncertainty of effects warrants, and may revise environmental assessments based on comments received without need of initiating another comment period.”43CFR § 46.305(b).

The draft PEA was made available for public review on May 24, 2021, when it was posted on the BIA's project-specific website (<https://www.bia.gov/fbfa-ea>). The dates, times, and information on how to register for the public comment meetings were also posted on the website.

The BIA prepared a public notice containing information on the draft PEA, the dates and times for the public meetings, and comment submittal information. The notice was sent to 50 addressees consisting of the nine affected chapters, individual stakeholders, business owners, tribal and federal representatives, and elected officials. The public notice identified the 30-day public comment period as beginning on May 24 and ending on June 23, 2021.

Public service announcements in the Navajo language were broadcast on KNDN, out of Farmington, New Mexico; KTNN out of Window Rock, Arizona; and KGAK out of Gallup, New Mexico. A total of 103 announcements were broadcast twice a day between 6:00 a.m. and 6:00 p.m. from May 17 to June 5, 2021. The public notice was also published several times in the Farmington Daily Times, Navajo-Hopi Observer, and Navajo Times between May 20 and June 5, 2021.

Four 2-hour outreach meetings were convened during the public comment period. The purpose of each meeting was to provide information about the draft PEA, answer questions, and hear comments and suggestions about the environmental analysis in the draft PEA. The meetings were conducted using webinars on the Zoom platform to adhere to COVID-19 pandemic public health orders. Interested parties could also call into the meetings using a toll-free number. The meetings were held on the following dates:

- June 02, 2021, Wednesday, 10:00 a.m. to 12:00 p.m.
- June 03, 2021, Thursday, 10:00 a.m. to 12:00 p.m.
- June 03, 2021, Thursday, 6:00 p.m. to 8:00 p.m.
- June 05, 2021, Saturday, 10:00 a.m. to 12:00 p.m.

Interested parties had the opportunity to submit comments by attending the virtual public meetings, through the project website, or via mail, fax, or email. During the comment period, the BIA received seven comment submittals. These submittals contained 15 individual comments. None of these comments resulted in additional analysis in the PEA. The comments received, and the BIA's responses are included in Appendix C.

1.4.4 Issues

The project interdisciplinary (ID) team included specialists from the BIA and the Navajo Nation Division of Natural Resources. The ID team was integrally involved in the internal scoping to identify potential issues, understand the proposal, develop the purpose and need, and develop the Proposed Action.

The key issues identified during agency scoping are summarized in Table 1-1. The impact indicators provided are used to describe the affected environment for each issue in Chapter 3, measure the change in the issue for the different alternatives, and assess the effects (or impacts) of implementing the alternatives.

Table 1-1. Issues Identified for Evaluation

Issue Statement	Impact Indicator
How would implementing the Proposed Action affect air quality?	<ul style="list-style-type: none"> ▪ Fugitive dust and emissions from construction and development, and other surface disturbance ▪ Potential increased population and related increased emissions ▪ Management actions designed to reduce soil erosion and improve rangeland health
How would implementing the Proposed Action affect soils?	<ul style="list-style-type: none"> ▪ Soil disturbance from development, commercial agriculture, livestock grazing, restoration projects— acres of highly erodible soils in the FBFA ▪ Maintaining and improving soil conservation and health—acres of highly erodible soils in Conservation Areas ▪ Management actions that include restoration projects
How would implementing the Proposed Action affect water resources?	<ul style="list-style-type: none"> ▪ Changes in water quality from development, agriculture, and livestock grazing ▪ Changes in water quality from the restoration of wetlands, riparian areas, and natural springs, streams, and streambank stabilization projects ▪ Water quantity—increased population and related increased water use
How would vegetation be affected by implementing the Proposed Action?	<ul style="list-style-type: none"> ▪ Vegetation removal for construction and development, or other surface disturbance—acres in Development Focus Areas ▪ Noxious weed/invasive species management ▪ Restoration projects
How would wildlife be affected by implementing the Proposed Action?	<ul style="list-style-type: none"> ▪ Retaining wildlife habitat—acres in Conservation Areas ▪ Habitat loss, modification, disturbance from development—acres in Development Focus Areas ▪ Increased potential for wildlife encounters and/or vehicle collisions ▪ Habitat restoration projects
How would implementing the Proposed Action affect agriculture?	<ul style="list-style-type: none"> ▪ Continued agriculture—acres in Agriculture Areas ▪ Restoration projects and preservation of productive areas
How would implementing the Proposed Action affect livestock grazing?	<ul style="list-style-type: none"> ▪ Continued livestock grazing—acres in Agriculture Areas ▪ Potential reduction of available forage—Acres in Development Focus Areas; limiting riparian areas for grazing ▪ Enforcement of grazing regulations ▪ Improving or repairing water features and structures, such as ponds, tanks, and windmills ▪ Range unit fencing installation/repair
How would implementing the Proposed Action affect special status species?	<ul style="list-style-type: none"> ▪ Ground disturbance ▪ Noxious weed/invasive species management ▪ Water quantity—increased water use from the expansion of water distribution systems

Using input from the ID team, a list of issues this PEA analyzed in detail was developed in accordance with guidelines set forth in the Indian Affairs NEPA Guidebook, 59 IAM 3-5 and the CEQ regulations

implementing NEPA. Consistent with 40 CFR 1501.9(f)(1), BIA identified and eliminated from detailed study the issues that are not significant or that have been covered by prior environmental review. Table 1-2 briefly discusses why these issues would not have a significant effect on the human or natural environment.

Table 1-2. Issues Eliminated from Further Evaluation

Resource	Rationale for Not Discussing in Further Detail
Topography	Implementing the Proposed Action would not approve any site-specific development. Any subsequent proposed development would be subject to tribal permitting processes and site-specific analysis. Any subsequent proposed development would also be subject to federal approval if required. Effects to topography or unique topographical features would be evaluated when a project is proposed, and design features or other mitigation measures would be implemented to limit or avoid potential effects.
Geology	Implementing the Proposed Action would not approve any site-specific development. There are no reasonably foreseeable environmental trends or planned actions that would affect the geological setting in the FBFA. In the future, should development be proposed that could affect geology (e.g., oil and gas extraction), that development would be subject to site-specific analysis, and design features or other mitigation measures would be implemented to limit or avoid potential effects.
Minerals	Implementing the Proposed Action would not approve any site-specific development. There are no reasonably environmental trends or planned actions that would affect the mineral estate in the FBFA. In the future, should development be proposed that could affect minerals (e.g., sand and gravel mining, oil and gas extraction), that development would be subject to site-specific analysis, and design features or other mitigation measures would be implemented to limit or avoid potential effects.
Cultural Resources	Implementing the Proposed Action would not approve any site-specific development. All development projects across the Navajo lands are culturally inventoried (archaeologically surveyed) for compliance with Section 106 (36 CFR 800) under the National Historic Preservation Act (NHPA). Any future proposed development would be inventoried for cultural resources and Traditional Cultural Properties (TCP). Navajo Nation Heritage and Historic Preservation Department would issue a Cultural Resource Compliance Form for final approval or disapproval for the future proposed development. Under this evaluation and approval process, there would be no adverse effects to significant cultural resources or TCPs in the FBFA.
Environmental Justice	Executive Order 12898 (59 Federal Register [FR] 7629), Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, requires that federal agencies identify and address, as appropriate, disproportionately high, and adverse human health or environmental effects of their programs and activities on minority and low-income populations. With respect to the Proposed Action, environmental justice issues would concern either socioeconomic conditions or health risk exposures. The Proposed Action's impact on the area economy would be beneficial and is not expected to adversely affect minority or low-income populations disproportionately. Proposed management actions would not produce hazardous waste or conditions that might affect human populations, nor result in other disproportionately adverse effects.
Hunting, Fishing, Gathering	Implementing the Proposed Action would not restrict tribal members access to hunting, fishing, or gathering areas. Tribal and non-tribal members would continue to be subject to the regulations for hunting, trapping, and fishing activities as provided in 17 Navajo Nation Code (NNC) 500, et seq. As determined by the Resources and Development Committee of the Navajo Nation Council, areas prohibited from hunting would remain the same. The Proposed Action would have no adverse effects on hunting, fishing, or gathering within the FBFA.

Resource	Rationale for Not Discussing in Further Detail
Timber Harvesting	Woodlands are forestlands not included within the timberland classification. Woodlands comprise approximately 17 percent of the nine Chapters in the FBFA, some of which are not within the exterior boundary of the FBFA. There are no commercial forestlands in the FBFA. The Proposed Action would not affect timber harvesting.
Recreation	The Little Colorado River Tribal Park and Marble Canyon Tribal Park are in the FBFA. These parks would continue to be managed by the Navajo Nation Parks and Recreation Department. There are plans to develop these parks further and possibly designate other tribal parks in the FBFA. These plans are being formalized in the Western Area Parks General Management Plan, and the effects of implementing that plan would be evaluated in a separate NEPA analysis. The Proposed Action would have no adverse effects on recreation.
Transportation Use Network	While future development in the FBFA includes improving transportation corridors, there are no plans to develop new highways or major roads. Some minor roads may be constructed to access scattered homesites or other developments, but these would not be expected to modify the transportation network substantially. In the future, should development be proposed that could substantially affect the transportation network, that development would be subject to site-specific analysis, and design features or other mitigation measures would be implemented to limit or avoid potential effects. The Proposed Action would have no adverse effects on the transportation network or use.
Indian Trust assets	Indian Trust Assets, or resources, are defined as legal interests in assets held in trust by the US Government for Native American Indian tribes or individual tribal members. Examples of Indian Trust Assets are lands, minerals, water rights, other natural resources, money, or claims. Congress has recognized and reaffirmed that the United States' federal trust responsibility includes a duty to promote tribal self-determination regarding governmental authority and economic development (Indian Trust Asset Reform Act, 25 USC § 5602). Implementing the Proposed Action would have no adverse effects on Indian Trust assets.
Socioeconomics	Implementing the Proposed Action would not affect socioeconomics in the FBFA. The Proposed Action supports environmentally and culturally responsible growth and economic development. However, adopting the IRMP would not authorize any development. Future actions identified in the nine CLUPs and the Navajo Thaw Regional Recovery Plan (Native Builders, LLC 2020) are expected to be developed whether or not the Proposed Action is approved and the IRMP implemented. The IRMP includes robust integrated management techniques for protecting environmental and cultural resources in the FBFA. An <i>Economic Impact and Socioeconomic Analysis of the Former Bennett Freeze Area</i> was prepared by Triple Point Strategic Consulting to estimate the economic impacts within the FBFA that would result from implementing the Navajo Thaw Regional Recovery Plan and is provided as Appendix B. Future growth and development in the FBFA as identified in the nine CLUPs and the recovery plan would have beneficial socioeconomic impacts to area residents.
Wilderness	There are no Wilderness areas in the FBFA. Implementing the Proposed Action would have no effect on Wilderness areas.
Noise	Implementing the Proposed Action would not affect noise levels in the FBFA. In the future, should development be proposed which could substantially affect the noise levels in noise-sensitive areas, that development would be subject to site-specific analysis, and design features or other mitigation measures would be implemented to limit or avoid potential effects.
Visual Setting	Implementing the Proposed Action would not approve any site-specific development. Future development in the FBFA could affect the visual setting, particularly for viewers along roads and highways; however, these effects would be minimized by design features and other mitigation measures, if needed, as determined during the site-specific analysis.

Resource	Rationale for Not Discussing in Further Detail
Climate Change	Implementing the Proposed Action would not approve any site-specific development. Future development in the FBFA may result in greenhouse gas emissions, mainly during the construction of buildings or other infrastructure. There are no reasonably foreseeable actions that would be expected to result in appreciable increased levels of greenhouse gases. The incremental contribution to global greenhouse gases from future development cannot be translated into global climate change in the FBFA.
Hazardous Materials	Implementing the Proposed Action would not involve the use of hazardous chemicals. Hazardous materials would continue to be managed pursuant to federal and tribal regulations.
Public Health and Safety	Implementing the Proposed Action would not affect public health and safety. Each Chapter has identified the need for projects such as water, powerline, and other utility infrastructure; improved access to health services; increased housing; and sanitation services such as solid waste transfer stations, landfills, and wastewater treatment facilities. However, the Proposed Action would not authorize any site-specific projects and would have no adverse effect on public health and safety.

1.5 Consistency with other Plans, Permits, Authorizations, and Approvals

The AIARMA obligates the Secretary of the Interior to “conduct all land management activities on Indian agricultural land in accordance with goals and objectives set forth in the approved agricultural resource management plan, in an integrated resource management plan, and in accordance with all tribal laws and ordinances.” (25 USC § 3712(a)). Therefore, the development, adoption, and implementation of the IRMP is in accordance with AIARMA and its implementing regulations (25 CFR Section 166.311, NNC Title 3) that require cooperation between the BIA and/or tribal governments to manage Indian agricultural and rangelands.

Title 2 of the NNC Section 501 (b) (7) authorizes the Resources and Development Committee of the Navajo Nation Council to report studies of natural resources for the protection and efficient utilization, management, administration, and enhancement of the Navajo Nation’s resources. The Resources and Development Committee is the approval body for the IRMP. This law specifies that an integrated approach to resource management is necessary. The BIA consulted with the Resources and Development Committee to ensure the IRMP accurately reflects the Navajo Nation’s policy and vision for the FBFA.

Title 26 of the NNC authorizes the Navajo Nation Chapters under the Local Governance Act to develop community-based land use plans using the standard guidelines to receive funding and address all community needs. The IRMP would be consistent with the Chapter Community Land Use Plans for the nine chapters in the FBFA.

The Navajo-Hopi Land Commission (NHLC) was codified by NNC Title 2, and the Office of Navajo and Hopi Indian Relocation was established by PL 93-531, as amended. In 1972, the NHLC office and Navajo Nation Land Commission (consisting of Navajo Nation Council Delegates under the Legislative Branch) were established. A plan of operation defines the roles and responsibilities of the offices and is updated periodically for both NHLC and Land Commission.

The BIA carries out its land management activities under AIARMA in accordance with applicable federal laws and regulations as well as tribal laws and regulations. Accordingly, adoption and implementation of the IRMP would be consistent with those applicable laws and regulations, which include, but are not

limited to, the list on the following pages. The Navajo Nation is currently developing an Agricultural Resource Management Plan through a self-determination agreement pursuant to AIARMA (25 USC § 3711(b)(1)(A)).

The level of detail and analysis in this PEA is broad in scope. Therefore, additional environmental analyses under the NEPA will be required for all future site-specific project proposals in the FBFA. When specific actions are considered, additional environmental evaluations would incorporate by reference the general discussions in this PEA and concentrate on the site-specific issues. This approach is known as “tiering” (40 CFR § 15001.11). The necessary environmental clearances and permits will be obtained before initiating construction activities of any subsequent development.

The environmental planning, consultation, and impact assessment processes have been integrated to comply with applicable federal and tribal regulations. The applicable laws that would need to be reviewed for consistency or required for environmental clearance for future ground-disturbing projects are listed below

- Agricultural Risk Protection Act of 2000 (PL 106-224)
- American Indian Agricultural Resource Management Act (PL 103-177; 25 USC Chapter 39)
- American Indian Religious Freedom Act (PL 95-341; Stat. 469 42 USC § 1996)
- Archaeological Resources Protection Act (PL 96-95; 16 USC § 470aa et seq.)
- Biological Resource Land Use Clearance Policies and Procedures (RCS-44-08)
- Carlson-Foley Act (PL 90-583)
- Clean Air Act (CAA) (PL 88-206; 42 USC § 7401)
- Clean Water Act (Federal Water Pollution Control Act) (PL 92-500; 33 USC §§ 1251-1151)
- Comprehensive Environmental Response, Compensation, and Liability Act (PL 96-510; 42 USC § 9601)
- Emergency Planning and Community Right-to-Know Act (PL 99-499; 42 USC § 11001 et seq.)
- Endangered Species Act (ESA) (PL 93-205; 16 USC §§ 1531-1544)
- Federal Insecticide, Fungicide, and Rodenticide Act (PL 61-152; 7 USC § 136 et seq.)
- Federal Land Policy and Management Act (PL 94-579; 43 USC Chapter 35)
- Federal Noxious Weed Act of 1974 (PL 93-629; 7 USC Chapter 61)
- Food, Conservation, and Energy Act (PL 110-234; 7 USC § 1926)
- Golden and Bald Eagle Nest Protection Regulations (RCS-42-08)
- Indian Affairs Manuals
- Indian Self-determination and Education Assistance Act, as amended (PL 93-638; 25 CFR Part 900)
- NEPA and CEQ regulations implementing NEPA
- National Historic Preservation Act (PL 89-665; 16 USC § 470(f) et seq.)
- National Indian Forest Resources Management Act (PL 101-630; 25 USC § 3101, et seq.; 25 CFR Part 163]
- Native American Graves Protection and Repatriation Act of 1990 (PL 101-601; 25 USC § 3001)

- Navajo Nation Air Pollution Prevention and Control Act (4 NNC 11)
- Navajo Nation Conservation and Wildlife Regulations (23 NNC 501)
- Navajo Nation Cultural Resources Protection Act (19 NNC 1001 et seq.)
- Navajo Nation Environmental Policy Act (4 NNC 9)
- Navajo Nation Fish and Wildlife Regulations (17 NNC 21)
- Navajo Nation Pesticide Act (4 NNC 3)
- Navajo Nation Policy to Protect Traditional Cultural Properties (2010)
- Navajo Nation Safe Drinking Water Act (22 NNC 1115)
- Navajo Nation Water Code (22 NNC 1101)
- Noxious Weed Control and Eradication Act (PL 108-412; 7 USC § 7781)
- Noxious Weed Coordination and Plant Protection Act (PL 106-224; 7 USC § 7701)
- Plant Protection Act (PL 106-224; 7 USC §7701 et seq.)
- Resource Conservation and Recovery Act (PL 94-580; 42 USC § 6901 et seq.)
- Safe Drinking Water Act (PL 93-523; 42 USC § 300)
- Toxic Substances Control Act (PL 94-469; 15 USC Chapter 53)

1.5.1 Plan Implementation

A critical outcome of the FBFA IRMP planning process is that it results in a framework for managing the multitude of resources available within the FBFA. The framework developed through this process would be utilized by Navajo Nation and BIA resource managers to develop lower-level resource management plans such as Agricultural Resource Management Plans (ARMPs), Range Management Plans (RMPs), and/or Cropland Management Plans (Figure 1-1).

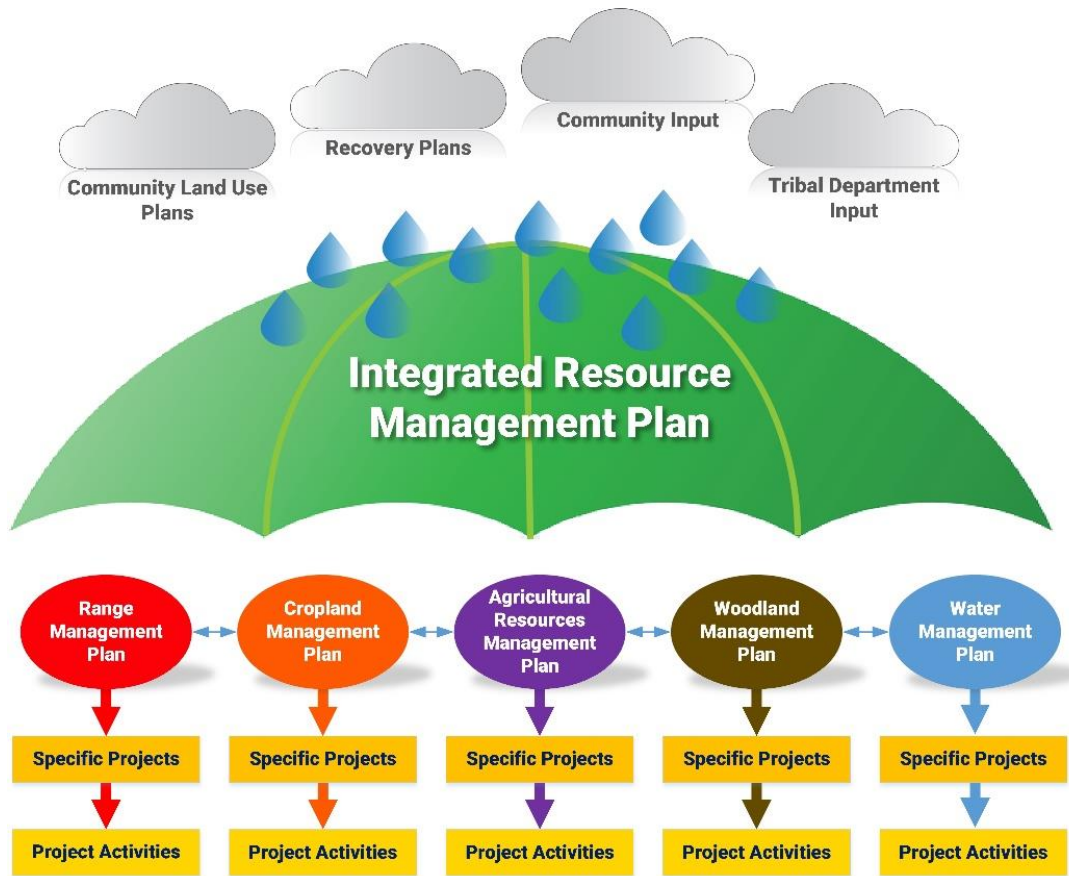


Figure 1-1. Integrated Resource Management Planning Process

The Navajo Nation and BIA would prepare and implement appropriate management actions consistent with the IRMP (e.g., range management plans, additional NEPA actions, conservation plans, annual work plans, etc.). The implementation process also includes the Navajo Nation's review of its existing regulations and codes to determine conformance with the IRMP. The IRMP is a living document and would be updated as determined by the Navajo Nation.

2. Proposed Action and Alternatives

This PEA is not the final review upon which approval of all actions in the FBFA would be based. Site-specific environmental analyses and additional NEPA compliance (i.e., Determination of NEPA Adequacy, Environmental Assessment (EA), or Categorical Exclusion) would be required for all site-specific actions. The scope of this additional approval process would be facilitated by the programmatic evaluation of the effects contained in this PEA. A list of eligible actions covered under Categorical Exclusions is provided in Appendix D.

2.1 No Action

Under the no action alternative, the IRMP would not be adopted and implemented to meet the FBFA goals and objectives for resource management. The BIA would not have a guiding document for the Secretary's land management activities carried out under AIARMA. Current land use and resource management activities would continue under existing laws and policies, land-use practices, management plans, and agreements. FBFA-wide planning and direction for desired development and land management would not occur, and Land Management Areas would not be delineated. There would be no long-range management plan based on Navajo Nation members' interests, needs, and concerns for their lands and natural and cultural resources.

2.2 Proposed Action – Balanced Growth Emphasis Alternative

The Proposed Action is the adoption of IRMP under the Balanced Growth Emphasis Alternative. This alternative supports environmentally and culturally responsible growth and economic development. The Balanced Growth Emphasis Alternative considers current Navajo Nation protection zones and restrictions on development and requires the more robust integrated management techniques identified in the IRMP. Development on FBFA land would conform to the goals and objectives of the IRMP. This alternative focuses on balancing growth and economic development with minimal impact on environmental and cultural resources.

The Balanced Growth Emphasis Alternative was developed to incorporate community goals and objectives of the affected communities while considering natural and cultural resources and existing infrastructure in the FBFA.

The IRMP will be a guiding document for the Secretary's land management activities pursuant to AIARMA. The IRMP serves as a guide and reference for land managers and Tribal members to direct and implement natural resource management. It is a planning tool to aid in FBFA recovery while effectively holistically managing natural resources. Each Chapter affected has unique goals and objectives for their community. The following is a summary of FBFA community goals based on the 2008 Recovery Plan and the nine CLUPs (WHPacific 2008a-j):

- Quality housing with dependable power and reliable potable water in both developed (urban centers) and rural areas within the FBFA
- Ability to foster safe communities with strong growth potential in the direction that each community sees fit

- Ability to provide gainful employment opportunities within the community for community members
- Provide lifelong educational opportunities to community members
- Economic opportunity that fosters education, training and provides jobs that support community desire to be self-sustaining and independent
- Easy access to health, medical, and social services
- Respect and honor for traditional values such as livestock grazing and agriculture while balancing the needs for growth and development within the community
- Protection of natural and cultural resources, historic properties, sacred sites, and sacred species

Each Chapter has identified both specific and general resource management and infrastructure development needs for their communities to address their goals and objectives. The types of infrastructure and development some or all Chapters identified in the 2008 Recovery Plan and their respective CLUPs include:

- Infrastructure/Utilities
- Transportation
- Housing
- Public Health and Safety
- Community Facilities
- Economic Development
- Education
- Open Space, Areas of Avoidance, and Grazing

2.2.1 Land Management Areas

The public clearly identified the need to protect natural and cultural resources and retain the rural nature of the FBFA for livestock grazing and agriculture while balancing the need for growth and development. The Land Management Area recommendations developed under the Balanced Growth Emphasis Alternative identify Conservation Areas, Development Focus Areas, Restricted Development Areas, and Agricultural Areas. These areas were derived from existing Navajo Nation policies and regulations, such as the Biological Resource Land Use Clearance Policies and Procedures. The analysis process used to determine the Land Management Areas is provided in Appendix E. The Land Management Areas are shown on Maps A-2 through A-6 in Appendix A.

Table 2-1 lists the proposed Land Management Areas, their approximate acreages, and percent of the total Navajo Nation land in the FBFA. The total acreage in Table 2-1 does not include any private land or other tribal inholdings such as Moenkopi or the San Juan Southern Paiute Area.

Table 2-1. Acreage of Proposed Land Management Areas in the Former Bennett Freeze Area

Land Management Area	Acres	Percent
Restricted Development	7,987	0.50
Development Focus	97,439	6.08
Conservation	576,314	35.98
Agricultural	919,850	57.43
Total	1,601,590	

Note: All acreages are approximations calculated using the best available data in geographic information systems software.

Conservation Areas

Conservation Areas are shown in blue on Maps A-2 through A-6 in Appendix A. These areas were derived to protect resources such as threatened or endangered species, biological preserves, and highly sensitive areas based on the Navajo Nation Department of Fish and Wildlife (NNDFW) and Wildlife Biological Resource Land Use Clearance Policies and Procedures. They are also designed to protect water quality in streams and other water sources based on a 0.25-mile buffer on primary streams and wetlands and a 0.5-mile buffer on springs, wells, and windmills.

Cultural resources, TCPs, and Navajo-Hopi Intergovernmental compact areas are not included in the Conservation Land Management Areas. Under the Proposed Action, these resources would continue to be protected through the existing permitting system, which requires cultural clearance for any proposed action.

While development is restricted in Conservation Land Management Areas, some developments such as scattered homesites, water, or other utility infrastructure may be approved on a case-by-case basis. Any development would continue to be subject to cultural and biological clearances, and additional best management practices (BMPs) or other mitigation measures to avoid or minimize effects to conservation resources may be identified during the permitting process.

Conservation Areas would also allow for permitted livestock grazing and agriculture.

Development Focus Areas

Development Focus Areas are shown in purple on Maps A-2 through A-6 in Appendix A. These areas include a 0.5-mile-wide corridor (0.25 mile on each side) along primary and secondary highways and roads, and buffers around communities such as Cameron and Tuba City, where development is proposed or expected to occur. Commercial and residential development in this Land Management Area would be easy to access, and other similar infrastructure such as water and utility lines would parallel existing roads and other disturbances. A priority for these areas would be the maintenance and development of water resources. Development Focus Areas would also allow for permitted livestock grazing and agriculture. The goals for Development Focus Areas would be to provide dependable, safe, and sustainable water, to improve the quality of life in tribal and native communities.

Restricted Development Areas

Restricted Development Areas are shown as orange on Maps A-2 through A-6 in Appendix A. These areas include abandoned uranium mines, floodplains, or other safety hazards where development or agriculture is discouraged. While these areas would not be suitable for residential or most commercial development, there is the potential for limited commercial development such as solar power generation facilities or other similar infrastructure. A priority for these areas would be monitoring and ensuring the long-term stability of uranium tailings sites.

Agricultural Areas

Agriculture Areas are shown in yellow on Maps A-2 through A-6 in Appendix A. Grazing, agriculture, scattered homesites, and open space land uses are recommended for these areas. The Little Colorado River and Marble Canyon Tribal Parks are within the boundaries of the FBFA. The Navajo Nation 2016 Homesite Leasing regulations restrict scattered homesite development within Tribal Parks. The goals for these areas would be to keep Navajo producers (ranchers and farmers) in compliance with the current Navajo Nation agriculture and grazing regulations; maximize development, productivity, and economical use of local farmland and irrigation water systems while ensuring their protection, conservation, and sustainability; and to implement integrated management activities that maintain or improve the ecological health of Navajo rangeland.

2.2.2 Management Actions

The goal of the IRMP is to create balanced natural resource management actions that reflect the social, cultural, economic, and natural resource values of FBFA residents. The IRMP supports community and Navajo Nation goals and promotes the sustainable development of FBFA resources by encouraging integrated resource management decision-making. Many of the management actions developed in the IRMP are related to improved interdisciplinary and interdepartmental communication protocols, data sharing, planning, organization, and public outreach and education.

This section lists the management actions that could result in surface disturbance and/or environmental effects. These management actions are applicable to the entire FBFA and not specific to any proposed Land Management Area. Future project-specific management actions that will result in surface disturbance will require additional site-specific environmental analyses under the NEPA.

Water

1. Quantify consumptive water use and demand in the FBFA based on current and future water demands to better identify water infrastructure deficiencies. Update annually.
2. Annually update existing inventories of water resources such as windmills, wells, storage tanks, stock ponds, and reservoirs.
3. Identify and monitor water sources that are safe for human and livestock consumption.
4. Identify and quantify system water loss and implement strategies to prioritize and combat system losses.

5. Conduct and prepare water availability studies and hydrologic assessments that can identify the best locations for well placement, surface water diversion, and water catchment systems.
6. Update, expand, and maintain water distribution systems to improve access to clean potable water.
7. Provide viable water supply alternatives.
8. Implement adequate protective buffers along Dobson Pond, Pasture Canyon Reservoir, lakes, streams, wetlands, and riparian zones and maintain the buffer zone identified by NNDFW to enhance and preserve water quality.
9. Limit access to riparian areas for grazing.
10. Inventory, conserve, restore wetlands, riparian areas, and natural springs.
11. Identify reaches along streams, rivers, and washes that need bank stabilization and other erosion mitigation.
12. Evaluate soil properties and determine best management practices and functions based on Natural Resource Conservation Service (NRCS) Ecological Site Descriptions.
13. Develop and implement sand dune migration mitigation where appropriate.

Agriculture

1. Develop different types of irrigated and dryland farming practices to maximize production and improve air, water, plant, and soil quality using US Department of Agriculture (USDA) NRCS conservation practices.
2. Identify areas of concern, implement restoration projects, and preserve productive areas.
3. Monitor, maintain, and evaluate specific conservation projects.

Noxious/Invasive Weeds

1. Coordinate weed removal efforts with adjacent landowners or managers, including state, local, and federal agencies, to prevent the further spread of weed populations.

Rangeland

1. Identify areas of concern, implement restoration projects, and preserve productive areas.
2. Restrict development such as solar and wind projects to areas where grazing is not conducive.
3. Use available technology to evaluate and monitor the condition of rangeland.
4. Continue to conduct and complete range inventories and monitoring every 10 years.

Woodlands

1. Inventory land to target priority areas that have denuded vegetation and loss and need restoration.
2. Conduct forest thinning activities within forestlands to provide room for tree growth, to help diversify vegetation base for wildlife species and reduce the risk of catastrophic wildland fire.
3. Reduce feral cows in forestlands.

Fish and Wildlife

1. Continue current monitoring efforts for sensitive wildlife and big game species and conduct habitat improvement projects to provide quality habitat where it has deteriorated.

3. Affected Environment and Environmental Consequences

This Chapter describes the environment that would be affected by implementing the alternatives described in Chapter 2 and the potential effects expected to result from implementing those alternatives. The affected environment described in this section focuses on the relevant major resources or issues that have the potential to be affected by the Proposed Action and the No Action Alternative. Affected environment descriptions reference and summarize the information in the Draft IRMP. For more information on the resources discussed in this Chapter, refer to the Final IRMP (NNDNR/BIA 2021).

It is important to note that the purpose of the IRMP is improved management and protection of natural resources on the FBFA. As such, the management activities are intended to have beneficial consequences for natural resources with minimal adverse effects.

3.1 Methodology for the Analysis

Programmatic environmental documents analyze effects on a broad scale, such as those resulting from proposed policies, plans, programs, or projects where subsequent specific actions will be implemented. NEPA analyses for subsequent actions are tiered to the programmatic NEPA review. Effects from implementing the Proposed Action in this Chapter are analyzed quantitatively where possible, and when necessary, qualitatively. The analysis considers the effects of the Proposed Action on the potentially affected environment and whether these effects are significant (40 CFR 1501.3(b)). All future activities in the FBFA would be evaluated in detail on a site-specific basis when each project is proposed.

Effects can be either long term (permanent, residual) or short term (incidental, temporary) (40 CFR 1501.3(b)(2)(i)). Short-term effects are sustained for only a limited time, and the environment usually reverts rapidly to the pre-construction condition. Effects may also be beneficial or adverse (40 CFR 1501.3(b)(2)(ii)).

3.2 Past Actions, Reasonably Foreseeable Environmental Trends, and Planned Actions

Development within the FBFA was restricted for 40 years under the Bennett Freeze. The Freeze stopped the development of new homes, businesses, roads, schools, or utility infrastructure, and no structural maintenance could occur. Two exceptions to the ban were allowed. One was for the placement/development of water wells, which were to be approved by both Tribes, and the second was the inclusion of administrative safe zones where development could occur. These administrative safe zones were in Tuba City and Moenkopi, Arizona. Agriculture and livestock grazing permits were not canceled and continued in the FBFA during the Freeze. The Freeze was lifted in 2006.

The following reasonably foreseeable environmental trends and planned actions are considered in this analysis. The planned actions discussed in this section are not part of the Proposed Action but are reasonably foreseeable. Many projects outlined in the CLUPs for chapters located in the FBFA are either conceptual, in the study phase, or the preliminary design stage. Some projects have already been completed or are in the process of being permitting and completed. Because the exact project locations, types, and specifics are generally unknown, this analysis is programmatic. Additional details on

reasonably foreseeable environmental trends and planned actions may be found in Appendix B in the *Economic Impact and Socioeconomic Analysis of the Former Bennett Freeze Area* or in the Navajo Thaw Regional Recovery Plan available online at navajothaw.com (Native Builders, LLC 2020).

Population

In 2000, the collective population of the nine Chapters in the FBFA was 19,718. By 2010, the collective population of all nine chapters was 22,928, and the population within the boundaries of the FBFA was 7,874. In 2020, the nine Chapters' collective population in the FBFA was 20,425, and the population within the FBFA itself was 6,872. Rather than increasing, the population has decreased by 12.6 percent within the nine Chapters and by 12.7 percent within the FBFA (Appendix B). An increase in population in the FBFA would be expected with the development of new housing, community facilities, and commercial establishments.

Utility Infrastructure

While some utility infrastructure exists in the FBFA, additional water, electricity, and natural gas infrastructure is planned for all nine Chapters as outlined in each CLUP. Sewer lines (wastewater treatment facilities) and water and power upgrades for existing homes are also proposed by Chapters for some communities. Improved telephone, cell phone, and internet service are also needed in the FBFA. The Navajo Nation Water Management Branch is planning regional water infrastructure projects, including the Western Navajo pipeline and C-aquifer Leupp to Dilcon pipeline (Native Builders, LLC 2020).

Energy Development

Navajo Power is proposing to develop the Painted Desert Solar Project—a 750-megawatt photovoltaic solar-generating and battery energy storage system facility in the Cameron and Coalmine Canyon chapters, approximately 4 miles east of Cameron, Arizona. The Navajo Tribal Utility Authority is also proposing a solar facility near Cameron; there are no details on this project currently.

In March 2020, Pumped Hydro Storage, LLC filed an application with the Federal Energy Regulatory Commission (FERC) for a preliminary permit proposing to study the feasibility of Big Canyon Pumped Storage Project. The application was accepted for filing and soliciting comments, motions to intervene, and competing applications. A preliminary permit does not authorize the permit holder to perform any land-disturbing activities or otherwise enter upon lands or waters owned by others without the owner's express permission. The feasibility of the project is still being evaluated. The project could consist of the following: (1) a 450-foot-long, 200-foot-high concrete arch dam (Upper West Dam), a 1,000-foot-long, 150-foot-high earth filled dam (Middle Dam), and a 10,000-foot-long, 200-foot-high concrete arch dam (Upper East Dam), each of which would impound three separate upper reservoirs with a combine surface area of 400 acres and a total storage capacity of 29,000 acre-feet at a normal maximum operating elevation of 5,390 feet average mean sea level (msl); (2) a 600-foot-long, 400-foot-high concrete arch dam (Lower Dam) that would impound a lower reservoir with a surface area of 260 acres and a total storage capacity of 44,000 acre-feet at a normal maximum operating elevation of 3,790 feet msl; (3) three 10,000-foot-long, 30-foot-diameter reinforced concrete penstocks; (4) a 1,100-foot-long, 160-foot-wide, 140-foot-high reinforced concrete powerhouse housing nine 400-kilowatt pump-turbine generators; (5) a 1,000-foot-long, 120-foot-wide, 40-foot-high reinforced concrete tailrace; (6) three water supply wells

with a capacity of 700 horsepower each and a 1,800-foot-long, 36-inch diameter well water supply pipeline; (7) two new double circuit 500-kilovolt (kV) electric transmission lines that connect the project switchyard to the existing 500-kV and 345-kV transmission lines located 14 miles east of the proposed project; and (8) appurtenant facilities. The estimated annual power generation at the Navajo Nation Big Canyon Pumped Storage Project would be 7,900 gigawatt-hours. This project is not affiliated with the Navajo Nation (FERC 2020).

Transportation

Two United States (US) Highways (US 89 and US 160) and two Arizona State Highways (Highway 64 and Highway 264) traverse through the FBFA. No new highways or other transportation corridors are reasonably foreseeable. However, maintenance and improvement of existing routes in the FBFA have been proposed by each Chapter. Roads identified for improvement in the CLUPs include Route N10, Route N20, Route N609/N614, Route N619, Route N6331/N6330, and other roads within each Chapter. The 2020 Recovery Plan references the Tuba City Airport Layout Plan, which calls for \$13.3 million in airport improvements (Native Builders, LLC 2020).

Housing

Each Chapter is planning new and renovated housing as outlined in their CLUPs. Housing will include clustered single-family homes, scattered single-family, and multi-family dwellings. Depending on the individual Chapter needs, women's shelters, group residential, and assisted living facilities are also planned.

Community Facilities

Reasonably foreseeable planned community facilities include educational facilities such as daycares, head start facilities, kindergarten through twelfth grade, and lifelong learning centers. Recreational facilities include playgrounds, parks, sports ballfields, picnic grounds, rodeo grounds, and recreation/wellness centers. There is also a need for multipurpose centers, senior centers, Chapter House renovations, animal shelters, post offices, veterans' centers, health care facilities, fire and police stations, and a tribal court. Medical facilities such as clinics and urgent care services and renovation and expansion of the Tuba City Regional Hospital are also planned by the Navajo Nation to improve public health.

Commercial Development

Commercial development expected to occur in the FBFA includes retail stores and restaurants, motel/hotel lodging facilities, tourism centers/museums, the Tuba City Business Information Center, and other Navajo-owned enterprises.

Agriculture and Grazing

Agriculture and livestock grazing would continue within the FBFA. Future trends include improving irrigation, repairing windmills, earthen dams, tanks, and developing other water sources for livestock. Bodaway Gap is working to develop primary water lines for livestock and agriculture to serve Cedar Ridge, Twin Hill, Pillow Hill, Tooth Rock, and Sam Willie.

The Little Colorado River Valley Farms Plan proposes to cultivate from 100 to 4,000 acres of fertile, irrigable soils adjacent to the river's alluvial aquifer.

The proposed Cameron Farm Enterprise would create a 133-acre enterprise farm to serve as a model for the Little Colorado River. The Cameron Chapter has received funding in a partnership with Tolani Lake Enterprises for this project. The project entails building infrastructure (fences, wells, solar power, pipes, and irrigation systems), developing policies for farming and community garden plots, hiring staff and recruiting youth growers, offering garden plots to families, planting and tending crops, offering beginning farmer training at an incubator farm, harvesting crops for market and community giveaways, celebrating the land, and learning to share with other communities.

Climate

Due to the region's arid climate, drought has been and will continue to be a major concern to the Navajo people (Navajo Nation Department of Water Resources 2003). Drought affects a wide variety of ecological processes vital to aquifer recharge, water quality, and other dynamics critical to the hydrologic environment.

Climate variability are likely to result in changes to the climate (e.g., temperature, precipitation timing, duration, intensity, and frequency), hydrology (e.g., snowmelt timing, streamflow), and ecosystems (e.g., species geographic distributions and population sizes) of the Navajo Nation. Much of the Navajo Nation economy and lifestyle are based on traditional practices such as livestock grazing (e.g., sheep, cattle, goats) and craft-making (e.g., weaving, jewelry production, artistry), all of which are likely to be impacted by climatic changes (Nania et al. 2014).

In the Navajo Nation, a long-term decrease in regional winter precipitation and regional annual precipitation has been observed starting in the 1930s (Redsteer et al. 2014). Warmer temperatures can influence evapotranspiration rates, leading to an overall decrease in available surface water features when combined with less annual precipitation. More than 30 percent of historical perennial water features on the reservation have disappeared or are ephemeral (Redsteer et al. 2014). Decreasing surface water availability translates to a decrease in water available for cities, agriculture, and ecosystems across the entire Navajo Nation, and drought and increased warming foster wildfires and increased competition for scarce water resources for people and ecosystems (Pryor et al. 2014).

3.3 Air Quality

3.3.1 Affected Environment

The Navajo Nation Environmental Protection Agency (NNEPA) has the authority to regulate sources of air pollution in the Navajo Nation through its Navajo Air Quality Control Program. The United States Environmental Protection Agency (USEPA) regulates criteria pollutants using the National Ambient Air Quality Standards (NAAQS), which establish ambient levels for each criteria pollutant using health and welfare-based criteria. The NAAQS are regulated to protect human health and the environment. The USEPA has set NAAQS for seven principal pollutants ("criteria" air pollutants): carbon monoxide (CO); nitrogen dioxide (NO₂); ozone (O₃); particulate matter equal to or less than 10 microns in diameter (PM₁₀); particulate matter equal to or less than 2.5 microns in diameter (PM_{2.5}); sulfur dioxide (SO₂); and

lead (Pb). There are two series of NAAQS. The “primary” standards are designed to provide an adequate margin of safety essential to protecting public health. The “secondary” standards are intended to protect public welfare from any known or anticipated adverse effects associated with the presence of a criteria pollutant in the ambient air. The primary standards protect public health, and secondary standards protect public welfare by preventing property damage such as farm crops and buildings, visibility impairment in national parks and wilderness areas, and the protection of ecosystems.

The Navajo Nation monitors four criteria air pollutants: PM_{2.5}, O₃, SO₂, and NO₂. Two monitoring sites are currently operated on the Navajo Nation; one at Shiprock, New Mexico, and the other at Nazlini, Arizona. Neither of these monitoring sites are in the FBFA. The Navajo Nation is designated as Class II status and therefore is designated as "unclassifiable/attainment" for NAAQS for criteria air pollutants within Arizona, New Mexico, and Utah (NNEPA 2021). A Class II designation allows some deterioration of air quality, while a Class I designation allows significantly less air quality deterioration.

Air quality in the FBFA is affected by construction, vehicle and equipment emissions, fugitive dust (particulate matter) from traffic on unpaved roads, wood/coal burning stoves, open burning, wildfires, and wind-blown sand. Recurring drought and land management practices have caused reactivation and renewed growth of sand dunes in the FBFA and the Navajo Nation. Diminished vegetation cover and an increasingly arid environment have resulted in an increase in the extent of sand susceptible to mobilization. Additionally, regionally significant sand and dust storms are becoming commonplace during the spring (Hiza 2002).

3.3.2 Effects from the Proposed Action Alternative

The NNEPA would continue to regulate air pollution sources in the FBFA through its Navajo Air Quality Control Program, in accordance with the CAA, as amended. Implementing the IRMP would not approve any site-specific development. In the future, should development be proposed which would result in emissions requiring an air quality permit, it would be subject to site-specific analysis. Ground disturbance to construct homes, install utilities, improve roads, implement restoration projects, and other development may result in short-term increases in particulate matter (PM_{2.5} and PM₁₀) and vehicle or equipment emissions during construction. BMPs would be implemented during construction to limit fugitive dust. These actions would be proposed individually over time and scattered throughout the FBFA and would not be expected to result in exceedances of NAAQS for criteria pollutants.

A population increase in the FBFA would be expected from building renovations and new housing, community facilities, commercial establishments, and other development, as well as installing utilities and other basic amenities. A goal for many Chapters is to increase tourism. More traffic would be expected to increase vehicle emissions resulting in long-term air quality effects. However, these emissions are not expected to result in exceedances of NAAQS for criteria pollutants.

Scattered homesites would continue to be leased in the FBFA outside of Tribal Parks. Residents may use coal or wood-burning stoves for heat which would adversely affect air quality. Over time, increased access to electricity from expanding power lines or standalone residential wind or solar power generation units may offset coal/wood burning impacts. However, based on the number of scattered homesites expected to be approved, these effects would likely be immeasurable and not expected to result in

exceedances of NAAQS for criteria pollutants. The development of solid waste disposal facilities would likely result in a long-term reduction in open burning and beneficial air quality effects.

Air quality may also be beneficially affected by the Proposed Action; however, these effects are not likely to be significant. Integrated management of soils, water, agriculture, and livestock grazing would improve rangeland ecological health by stabilizing soils and reducing wind-blown sand. Management actions such as developing and implementing sand dune migration mitigation would also serve to reduce wind-blown soil. No significant adverse or beneficial effects on air quality are expected from implementing the Proposed Action.

3.3.3 Effects from the No Action Alternative

Under the No Action Alternative, the IRMP would not be implemented. The NNEPA would continue to regulate air pollution sources in the FBFA through its Navajo Air Quality Control Program, per the CAA, as amended. Should a future development be proposed, which would result in emissions requiring an air quality permit, it would be subject to site-specific analysis and permitting through the NNEPA and USEPA, as required.

Effects on air quality from development and increased population would be the same as those described under the Proposed Action. However, integrated management of soils, water, agriculture, and livestock grazing as outlined in the IRMP would not occur. The management actions identified to improve rangeland ecological health by stabilizing soils and reducing wind-blown sand would not be implemented. Any beneficial long-term impacts on air quality from integrated resource management would not be realized.

3.4 Soils

3.4.1 Affected Environment

Soil management in the FBFA utilizes the USDA/ NRCS Soil Surveys and Ecological Site Descriptions as resources to guide decision making. Soils in the FBFA have formed from several different types of parent material (including shale, sandstone, and limestone) and alluvial, residual, and eolian sources.

Soil properties influence the development of building sites, the selection of sites, the design of the structure, construction, maintenance, and performance after construction. Most soils in the FBFA are rated as having very limited potential for small commercial development; however, some areas within the Bodaway-Gap, Coppermine, Kaibeto, Tonalea, Tuba City, and Coalmine Canyon Chapters, contain soils that would better support small commercial building development. The potential for traditional roadway (asphalt or concrete) development is similarly limited in the region. There are far more areas within the FBFA that are suitable for natural surface road systems or chemically treated (lithified) natural surface road systems than there are for traditional road systems (NNDNR/BIA 2021).

Soils are rated by the NRCS based on their susceptibility to degradation with the Fragile Soil Index (USDA/NRCS 2021). Fragile soils tend to be highly susceptible to erosion and can have a low capacity to recover after degradation has occurred. They are characterized by low organic matter, low water-stable aggregates, and an absence of structure. They occur on sloping ground, in arid and semi-arid regions,

have sparse vegetative cover and low biodiversity. Ratings are, from least fragile to most fragile: Not Fragile, Slightly Fragile, Moderately Fragile, Fragile, Highly Fragile, and Extremely Fragile (USDA/NRCS 2021). Of the 1.6 million acres of soils in the FBFA, 1.4 million are rated as Fragile or Highly Fragile (Table 3-1).

Table 3-1. Acres of Fragile Soils in the Former Bennett Freeze Area

Soil Type	Acres
Moderately fragile	9,855
Fragile	1,199,542
Highly fragile	193,067

Soil erodibility comprises the inherent properties of a soil that play a major role in soil erosion, including texture, structure, organic matter content, and permeability (USDA/NRCS 2011). The soil erodibility factor K quantifies the susceptibility of soil to erosion: soils high in clay have low K values, about 0.05 to 0.15, because they are resistant to detachment. Coarse textured soils, such as sandy soils, have low K values, about 0.05 to 0.2, because of low runoff even though these soils are easily detached. Medium textured soils, such as the silt loam soils, have moderate K values, about 0.25 to 0.4, because they are moderately susceptible to detachment and produce moderate runoff. Soils having a high silt content are the most erodible of all soils. They are easily detached, tend to crust, and produce high rates of runoff. Values of K for these soils tend to be greater than 0.4 (USDA/NRCS 2011). In the FBFA, 511,655 acres of soils have moderate or higher K values (Appendix A, Map A-7).

While most soils in the FBFA are not conducive to development or road construction based on soil limitations and erodibility—development can occur with soil reclamation, special design, or installation procedures.

3.4.2 Effects from the Proposed Action Alternative

Implementing the Proposed Action would not approve any site-specific development. The locations of future actions and exact area of disturbance is not known. Soils within the FBFA, particularly in the Development Focus Land Management Areas, presumably could be impacted depending on the nature of future actions. Development Focus Land Management Areas comprise approximately 6 percent (or 97,439 acres) of the FBFA and are where most surface disturbing activities are expected to occur—although surface disturbance could occur anywhere in the FBFA, depending on the type of development (e.g., waterlines or electric lines may cross multiple Land Management Areas). It should be noted that not all the acreage within Development Focus Land Management Areas is expected to be disturbed.

Approximately 26,000 acres of soils in the Development Focus Land Management Area have moderate or higher K values, as shown in Table 3-2. Soils with higher K values are highly erodible and subject to greater potential wind and water erosion.

Table 3-2. Acres of Highly Erodible Soils (Higher K Values) in the Former Bennett Freeze Area

Land Management Areas	K Greater than or Equal to 0.25 (Acres)
Development Focus	26,444
Conservation	163,682
Agricultural	315,402
Restricted Development	6,126

Soil stability and water infiltration capacity are dependent on vegetation cover (Meeuwig 1970). Surface disturbance exposes topsoil and other soil material to increased wind and water erosion. Soil disturbance may result in soil mixing and compaction. Once disturbed areas are stabilized—with permanent infrastructure (e.g., buildings, gravel, pavement) or revegetated—the potential for soil erosion is greatly reduced. Permanent infrastructure would increase the amount of impermeable surface and reduce infiltration, creating conditions for increased erosion and stormwater runoff. Future actions would implement BMPs before and after construction to minimize the impacts of erosion both in the short and long term. Long-term adverse effects on soils would be minimized by measures such as retaining native vegetation to the greatest extent possible and by reclaiming and replanting disturbed areas outside of permanent infrastructure.

Commercial agriculture can affect soils. Repeated tillage and heavy equipment operation cause the development of a compaction layer beneath the soil surface, which acts as a water infiltration barrier, increasing runoff. Tillage also disturbs soil microbial life, which is important for healthy native plant communities and increases soil loss through deflation (i.e., wind erosion). The Proposed Action would implement management actions to encourage the development and use of different types of irrigated and dryland farming practices to improve soil quality using NRCS conservation practices.

Rangeland overutilization by both authorized and unauthorized livestock, wildlife, and Navajo free-ranging horses can diminish vegetation cover, exposing soils to erosive forces (USDA/NRCS 2003). Drought and climate change may also contribute to soil erosion, and loss as vegetation cover and water availability are diminished. The Proposed Action would implement integrated rangeland, soil, water, and vegetation management actions to meet the goal of reducing the impacts from erosion, sustaining and improving soil quality, retaining plant and animal/microbial life above and below the soil surface, and rehabilitating soil damaged by land degradation.

Under the Proposed Action, NRCS soil survey reports and Ecological Site Descriptions would be used to identify BMPs based on soil classification and content. These BMPs would stabilize soils and reduce the potential for soil erosion.

Designating Conservation Land Management Areas in the FBFA would maintain and improve soil conservation and health by limiting development and requiring additional mitigation measures on a case-by-case basis. Approximately 36 percent (576,314 acres) of the FBFA would be designated as Conservation Land Management Areas. These areas are already subject to conservation practices under the NNDFW Wildlife Biological Resource Land Use Clearance Policies and Procedures. The designation of Conservation Land Management Areas is not likely to have significant beneficial effects. As shown in

Table 3-2, approximately 163,682 acres (28 percent) within the proposed Conservation Land Management Areas are classified as having highly erodible soils.

Integrated management actions implemented under the Proposed Action that would preserve and restore habitats would beneficially affect soil stability and reduce runoff and erosion. The Proposed Action would implement management actions to identify reaches along streams, rivers, and washes that need bank stabilization and other erosion mitigation. These restoration projects would result in long-term beneficial effects on soils in the FBFA; however, these effects are not likely to be significant. No significant adverse effects on soils are expected from implementing the Proposed Action.

3.4.3 Effects from the No Action Alternative

Under the No Action Alternative, the IRMP would not be implemented. Soils in the FBFA would continue to be subject to disturbance, mixing, and compaction from a suite of development, agriculture, livestock grazing, and the effects from drought resulting in continued wind and water soil erosion. The effects on soils from development, ongoing land use, and drought would be the same as those described under the Proposed Action.

However, integrated management of soils, water, agriculture, and livestock grazing as outlined in the IRMP would not occur. Integrated management actions identified to preserve and restore habitats that would beneficially affect soil stability and reduce runoff and erosion would not be implemented. There would be no coordinated effort to implement integrated rangeland, soil, water, and vegetation management actions to meet the goal of reducing the impacts from erosion, sustaining and improving soil quality, retaining plant and animal/microbial life above and below the soil surface, and rehabilitating soil damaged by land degradation.

3.5 Water Resources

3.5.1 Affected Environment

All water resources on the Navajo Nation are subject to the Navajo Nation Water Code and are managed by the Navajo Nation Department of Water Resources (NNDWR). The Navajo Nation has enacted the Navajo Nation Clean Water Act and Water Quality Standards and the Navajo Nation Safe Drinking Water Act. The NNEPA Public Water Systems Supervision Program has been delegated authority from the USEPA Region 9 to regulate Public Water Systems on the Navajo Nation through the Navajo Nation Safe Drinking Water Act. The NNEPA Public Water Systems Supervision Program is responsible for ensuring owners and operators of drinking water facilities provide safe drinking water to Navajo Nation residents through inspection, monitoring, and enforcement. The Navajo Nation Safe Drinking Water Act and the Navajo Nation Primary Drinking Water Regulations ensure drinking water protection by establishing appropriate drinking water quality standards called Maximum Contaminant Levels. The NNEPA Public Water Systems Supervision Program also provides technical assistance in determining protection zones around drinking water wells. Wellhead protection ensures communities are aware of the drinking water source or “wellhead” quality. This program ensures communities consider the environment when conducting development activities (NNDWR 2011).

The NNEPA administers Water Quality Certification (Clean Water Act [CWA] Section 401) on the Navajo Nation. Section 401 requires that any applicant pursuing a permit to conduct an activity that may result in a discharge of a pollutant must obtain a water quality certification (or waiver). Water quality certification requires evaluating water quality considerations associated with dredging or placement of fill materials into waters of the US and imposes project-specific conditions on development.

The USEPA administers the National Pollutant Discharge Elimination System (CWA Section 402) on tribal lands to protect the quality of water resources on the reservation. Construction activities that disturb more than 1 acre are regulated under the National Pollutant Discharge Elimination System General Permit for Discharges of Storm Water Runoff Associated with Construction Activity (General Construction Permit). Coverage under the General Construction Permit requires preparing a Storm Water Pollution Prevention Plan and Notice of Intent.

The United States Army Corps of Engineers (USACE) authorizes dredge and fill permits in waters of the US (CWA Section 404). Section 404 regulates the discharge of dredged and fill materials into waters of the US, which include oceans, bays, rivers, streams, lakes, ponds, and wetlands. Before any actions that may affect surface waters are implemented, a delineation of jurisdictional waters of the US must be completed, following USACE protocols, to determine whether a project area contains wetlands or other waters of the US that qualify for CWA protection. Project proponents must obtain a permit from USACE for discharges of dredged or fill material into jurisdictional waters of the US before proceeding with a proposed activity.

Watersheds within the FBFA boundaries include the Lower Colorado-Marble Canyon, Moenkopi Wash, Lower Little Colorado, and the Dinnebito Wash. Surface water resources within the FBFA consist of perennial streams, ephemeral streams, springs, and wetlands. The major surface water features within the FBFA are the Colorado River and the Little Colorado River. Utilizing these resources is complicated by many factors, including legal, environmental, flow variability, and quality (e.g., total dissolved solids concentrations). Water resources in the FBFA are shown on Map A-8 in Appendix A.

Other smaller sources of surface water in the FBFA are wholly ephemeral in nature and hardly considered reliable for municipal or domestic use. However, the ephemeral water bodies do play a role in water supplied for irrigation and livestock purposes.

Water quality issues associated with abandoned uranium mines (AUMs) in the Bodaway-Gap, Cameron, Coalmine Canyon, and Tuba City Chapters. These issues are in local pockets of alluvium and colluvium near the mine sites. No significant level of radionuclide contamination has been detected in the major source aquifers of the area. It is not clear if hydrologic connections exist between these localized aquifers and the deeper groundwater sources (NNDNR/BIA 2021). However, there have been levels of uranium, arsenic and other contaminants above the maximum contaminant levels detected in waters produced from aquifers in the FBFA (Ingram et al. 2020).

Other areas of concern for water quality include a lack of vegetation, overgrazing, road building, and trash dumping. Due to lack of landfills, trash dumping leads to widespread contamination of both surface and groundwater sources. Lack of vegetation, overgrazing, and roadbuilding contribute to erosion—one of the largest environmental factors affecting water quality in the area. Soil erosion leads to increased pollution and sedimentation in streams and rivers, causing declines in fish and other species.

The lack of infrastructure exacerbates water quality issues and creates higher risks to public health where livestock windmills may be more conveniently located than regulated drinking water sources. One of the most pressing needs is the expansion of infrastructure throughout the FBFA. The lack of infrastructure establishes the most significant water resource issue on the Navajo Nation that also contributes to poor economic development and a sustained poverty level. It is estimated that approximately 30 to 40 percent of households in the FBFA lack connection to a municipal and domestic water system (NNDWR 2011). This forces individuals and communities to depend upon low-quality water sources or water hauling for everyday uses.

Groundwater is more plentiful in the FBFA than surface water and has served as the primary source of drinking water supply for many years. Major groundwater supplies include the Coconino Sandstone (C-Aquifer), Navajo Sandstone (N-Aquifer), Dakota Sandstone (D-Aquifer), and the alluvium. Water quality in the D-Aquifer is generally poor and extends only into the Tuba City region in a small portion; the C-Aquifer is located at a considerable depth and overlain by the D- and N-Aquifers in most of northeastern Arizona (Brown and Caldwell 2016a).

In 2016, Brown and Caldwell prepared the Master Public Water System Plan for Tuba City Chapters. According to the plan, future demand for potable water in the Tuba City region—which includes the FBFA—was anticipated to grow at similar water use rates in surrounding communities in Arizona and based on anticipated residential, commercial, and industrial growth within the Chapters. Projected future potable water demand for the Chapters was developed based on current population estimates, the estimated population growth rate over the planning horizon, and projected future per capita water demand (Brown and Caldwell 2016b). Table 3-3 shows the project potable water demand growth for the nine chapters in the FBFA to 2040.

Table 3-3. Projected Tuba City Nine Chapters Region Average Annual Daily Water Demand

Year	Range of Average per Capita Daily Demand¹	Projected Chapter Population	Average Chapter Daily Demand (gallons/day)
2013	34-114	22,723	1,805,200
2020	66-121	24,874	2,274,400
2030	90-131	28,302	3,073,100
2040	113-141	32,026	4,048,800

¹ Per capita demand was calculated from Navajo Tribal Utility Authority customer billing data for each of the 10 water systems in the study. The range listed represents the water system with the lowest per capita demand and the water system with the highest.

Source: Brown and Caldwell 2016b.

Currently, there is high unmet demand for potable water in the FBFA, and demand is expected to increase; however, not at the rates projected in the Brown and Caldwell (2016b) report since those projections were based on estimated population increases that have not materialized. In fact, the population in the FBFA has decreased since 2010. Should living conditions improve within the FBFA, population increases may reach those projected in the future.

3.5.2 Effects from the Proposed Action Alternative

3.5.2.1 Water Quality

One of the primary goals of the IRMP is to ensure projects prepare and implement surface water management as part of the project development in accordance with the tribal and federal water quality regulations. Implementing the Proposed Action would not approve any site-specific development.

While reasonably foreseeable planned actions may result in effects to water quality, these are not reasonably foreseeable effects from the Proposed Action. Surface water quality presumably could be affected during future development by increased sedimentation and/or the introduction of industrial fluids (e.g., diesel, gasoline, or oil) into local waterways. Ground disturbance would expose soils leading to an increase in an undetermined amount of sediment transport, particularly during and following storm events. Slight alterations in area drainage patterns may also lead to an increase in sediment transport. These effects would persist until areas are temporarily or permanently stabilized. There would be a potential for accidental spills or release of fluids that could impact local water quality. Reasonably foreseeable development in the FBFA could lead to an overall increase in runoff which, in some cases, could carry contaminants related to human activity such as excess nutrients from agricultural land and petrochemicals into local waterways. The potential for these effects would vary based on the type and location of an activity and would be avoided or minimized by implementing BMPs or other mitigation measures identified on a case-by-case basis when a specific project is proposed. Future actions may require CWA permitting, which would be identified at the time a project is proposed.

More agriculture in the FBFA could affect surface water quality caused by increased sedimentation in runoff. Long-term agriculture operations can create a compacted layer beneath the soil surface, which acts as a water infiltration barrier and increases runoff. Runoff from farms can carry soluble pollutants such as pesticides, herbicides, and chemical fertilizers downstream. The Proposed Action includes management actions to encourage the development of different types of irrigated and dryland farming practices to improve water quality using NRCS conservation practices. Rangeland overutilization affects water quality by reducing vegetative cover and exposing soils to erosion. Effects on water quality from continued agriculture and livestock grazing are not expected to result in exceedances of NNEPA or USEPA Water Quality Standards with the implementation of BMPs or other mitigation measures and the requirements for CWA permitting.

The Proposed Action includes management actions such as implementing protective buffers along Dobson Pond, Pasture Canyon Reservoir, lakes, streams, wetlands, and riparian zones to enhance and preserve water quality; limiting access to riparian areas for grazing; installing and maintaining structural BMPs during surface disturbance, and water quality monitoring. Implementing these management actions would have long-term beneficial effects on water quality; however, these effects are not likely to be significant.

Under the Proposed Action, reaches along streams, rivers, and washes that need bank stabilization and other erosion mitigation would be identified. Wetlands, riparian areas, and natural springs would be inventoried, restored if needed, and conserved. There would be short-term effects on water quality during stabilization and restoration efforts, mainly due to increased turbidity from sediment transfer. Effects on water quality from restoration and stabilization projects are not expected to result in exceedances of

NNEPA or USEPA Water Quality Standards as BMPs would be implemented to avoid adverse effects. Long-term insignificant beneficial impacts on water quality would result from stabilized soils and enhanced riparian habitats.

Restoration activities at springs or other groundwater sources could have short-term adverse effects on water quality but long-term beneficial effects on groundwater quality and availability. Ongoing efforts to monitor and ensure long-term stability of AUMs would continue and are not expected to affect groundwater quality. Illegal dumping would be expected to decrease by developing landfills and providing more solid waste transfer stations where residents can dispose of solid waste appropriately. Installing wastewater systems in communities or clustered developments would have beneficial long-term effects on groundwater quality. While the Proposed Action may result in beneficial effects, they are not likely to be significant. No significant adverse effects on water quality are expected from implementing the Proposed Action.

3.5.2.2 Water Quantity

Improved water distribution systems and better access to potable water would improve FBFA residents living conditions by reducing water hauling and reliance on poor-quality water sources used to meet daily needs. Increased population and economic growth in the FBFA would correlate to increased water use. Table 3-3 lists the average Chapter daily demand projected for the period between 2020 and 2040 (Brown and Caldwell 2016b). Based on these projections, estimated water demand would increase by 124 percent between 2013 and 2040. This is probably an overestimation since the projections were based on population growth estimates that are much greater than what is likely. Between 2010 and 2020, the population decreased in the FBFA rather than increased. Planned agriculture projects would also increase water use. However, there are no agricultural water demand projections.

The IRMP does not identify any specific projects that would use measurable amounts of water. Potable water demand is expected to increase whether the IRMP is implemented or not. Reasonably foreseeable planned actions in the FBFA, not contemplated in the IRMP, are expected to result in increased water use. While reasonably foreseeable planned actions may result in effects to water quantity, these are not reasonably foreseeable effects from the Proposed Action.

Potential effects on water quantity from increased use for reasonably foreseeable planned actions would result in long-term and irretrievable effects on the resource. Increased potable water demand may be met by surface or groundwater sources. However, it is unknown when, where, or from what source or the actual water quantity needed to meet future demand or actions. In the future, when a project is proposed, it would be subject to site-specific NEPA analysis, and the effects from water depletion or withdrawals would need to be analyzed at that time.

Under the Proposed Action, management actions would serve to minimize effects on water quantity. The actions include quantifying consumptive water use and demand in the FBFA based on current and future water demands to better identify water infrastructure deficiencies and identifying and quantifying system water loss and implementing strategies to prioritize and combat system losses. The Proposed Action is not expected to result in significant effects on water quantity.

3.5.3 Effects from the No Action Alternative

Under the No Action Alternative, the IRMP would not be implemented. Effects on water quality would be similar to those described under the Proposed Action. Ongoing efforts to monitor and ensure long-term stability of AUMs would continue and are not expected to affect groundwater quality.

However, management actions such as protective buffers along ponds, reservoirs, lakes, streams, wetlands, and riparian zones enhance and preserve water quality; limiting access to riparian areas for grazing; installing and maintaining structural BMPs during surface disturbance, and water quality monitoring would not be implemented. Reaches along streams, rivers, and washes that need bank stabilization and other erosion mitigation would not be identified. Wetlands, riparian areas, and natural springs would not be inventoried, restored, or conserved. Any long-term beneficial effects on water quality from these actions would not occur.

Under the No Action Alternative, effects on water quantity would be similar to those described under the Proposed Action because these effects would primarily occur from reasonably foreseeable environmental trends and planned actions. In the future, when a project is proposed it would be subject to site-specific NEPA analysis, and the effects from water depletion or withdrawals would be analyzed at that time. However, the management actions outlined in the IRMP designed to minimize water quantity effects would not be implemented. These actions include quantifying consumptive water use and demand to better identify water infrastructure deficiencies, identifying and quantifying system water loss, and implementing strategies to prioritize and combat system losses.

3.6 Vegetation

3.6.1 Affected Environment

The IRMP identifies and details five vegetation communities in the FBFA: woodland, desert shrubland, grassland, riparian forest, and wetland/open water. The majority of vegetation in the FBFA is classified as Great Basin desert scrubland (NNDNR/BIA 2021).

Noxious weeds have impacted every habitat on the Navajo Nation, which has affected the Navajo people's economic, historic, and cultural livelihood. Because of noxious weeds on rangelands, the overall capacity of the land to support livestock and wildlife has been reduced (Lym and Kirby 1987). Noxious weeds can alter soil temperature, soil salinity, water availability, nutrient cycles and availability, native seed germination, water infiltration, and precipitation runoff (DiTomaso 2000; Lacey et al. 1989). Monocultures of noxious weeds can cause greater risk of catastrophic fires, causing further declines in native shrubs and grasses. Species such as camelthorn can cause economic damage to infrastructure. This species and others can grow through surfaces impenetrable to other plants, including pavement, concrete, and the foundations of houses and buildings (USFS 2017).

The expansion of noxious weeds within riparian areas is also a concern. Woody noxious species such as tamarisk and Russian olive have formed dense monocultures within many riparian areas on the Navajo Nation, limiting biodiversity. The introduction of the tamarisk leaf beetle and its subsequent migration in the Navajo Nation's riparian corridors has left many areas devoid of living plant material. The monocultures of the dead, standing tamarisk in riparian areas increase the risk of wildfire.

The BIA Noxious Weed Control program was initiated in December 1988 in response to congressional directives for improved management on Indian lands. The Noxious Weed Eradication program's primary function is to provide resource protection on trust lands in compliance with the AIARMA and the Plant Protection Act.

The BIA NRO has initiated efforts to control specific target noxious weeds on the Navajo Nation using various methods. In 2009, the BIA NRO created a list of target noxious weed species to prioritize weed management projects. There are 15 High Priority (A) species, two Medium Priority (B) species, and four Low Priority (C) species on the list. High Priority (A) weeds have a potential for widespread expansion and are weeds that the BIA and Navajo Nation consistently request funding for treatment. Medium Priority (B) species are non-native noxious weeds that may occur in isolated patches. Emphasis for these weeds is on immediate control, prevention of seed spread, and eradication. Low Priority (C) species are normally widespread and well established but are not a high priority due to limited weed funding.

The BIA Noxious Weed Control Program has continued to assist land users but without a coordinated and systematic approach towards addressing weed issues. The current approach is driven by consent from the land user through project coordination with the local BIA Noxious Weed Coordinator and resolutions from the local Chapter. This approach has resulted in responsive efforts as opposed to a strategic approach to weed management. Current weed management projects also do not adequately provide treatment methods for preventing and controlling the spread of current populations into non-impacted sites. This leaves many Navajo Nation areas vulnerable to infestation, especially along roads or waterways or in agricultural and development areas.

In 2012, the BIA NRO determined the need for an integrated and coordinated management plan that utilized methodical, science-based strategies to actively monitor and control noxious weeds. In conjunction with developing a weed management plan, NRO determined that compliance with the NEPA was necessary to facilitate discussions with the public regarding the potential impacts of weed management. The BIA is currently preparing a Programmatic Environmental Impact Statement to evaluate the effects of implementing the Integrated Weed Management Plan prepared in 2013.

3.6.2 Effects from the Proposed Action Alternative

Ground disturbance would have both short- and long-term effects on vegetation. Removal of vegetation could alter macro- and micro-vegetation elements, stimulation of the seed bank, and the establishment of annual plant communities dominated by exotic or invasive species, changes to soil structure, soil compaction, and increased erosion (Lovich and Bainbridge 1999). Development Focus Land Management Areas comprise approximately 6 percent (97,439 acres) of the FBFA. They are where most surface-disturbing activities are expected to occur—although surface disturbance could occur anywhere in the FBFA, depending on the type of development (e.g., waterlines or electric lines may cross multiple Land Management Areas). Future projects would use BMPs to limit vegetation removal, reseeding, or chemical/mechanical noxious weed treatments before and after construction to minimize adverse effects on vegetation.

Under the Proposed Action, management actions would have long-term beneficial effects on vegetation in the FBFA. Establishing conservation areas, improving woodland management practices, preserving and restoring riparian and wetland ecosystems, and employing integrated noxious weed management would

benefit vegetation community health. The Proposed Action would implement integrated rangeland, soil, water, and vegetation management actions to meet the goal of limiting the spread of invasive noxious weeds and other undesirable vegetation. Under the Proposed Action, no significant adverse or beneficial effects on vegetation are likely.

3.6.3 Effects from the No Action Alternative

Effects on vegetation from the No Action alternative would be similar to those described under the Proposed Action. However, management actions to establish conservation areas, improve woodland management practices, preserve and restore riparian and wetland ecosystems, and integrated weed management would not be implemented. Integrated rangeland, soil, water, and vegetation management actions to meet the goal of limiting the spread of invasive noxious weeds and other undesirable vegetation would not be implemented.

3.7 Wildlife

3.7.1 Affected Environment

The NNDFW has prepared a development planning tool to avoid biologically sensitive areas throughout the Navajo Nation. Areas in the Navajo Nation are categorized according to the potential impact of development on wildlife and their habitats in those areas. This designation is part of the Biological Resource Land Use Clearance Policies and Procedures. The six wildlife areas include:

1. **Highly Sensitive Areas**—contain the best habitat for endangered and rare plant, animal, and game species, and the highest concentration of these species on the Navajo Nation. The purpose of this area is to protect these valuable and sensitive biological resources to the maximum extent practical.
2. **Moderately Sensitive Areas**—This area has a high concentration of rare, endangered, sensitive, and game species occurrences or has a high potential for these species to occur throughout the landscape. The purpose of this area is to minimize impacts on these species and their habitats and to ensure the habitats in Area 1 do not become fragmented.
3. **Less Sensitive Areas**—This area has a low, fragmented concentration of species of concern. Species in this area may be locally abundant on “islands” of habitat; however, islands are relatively small, limited in number, and well-spaced across the landscape. However, the NNDFW recognizes that lands within Area 3 may not be completely surveyed for the potential occurrence of sensitive species or habitats.
4. **Community Development Areas**—The NNDFW has determined that areas around certain communities do not support the habitat for species of concern, and therefore development can proceed without further biological evaluation. Whenever possible, the NNDFW recommends that project sponsors attempt to locate their projects within Community Development Areas.
5. **Biological Preserve Areas**—These areas contain excellent, or potentially excellent, wildlife habitat and are recommended by the NNDFW for protection from most human-related activities, and in some cases, are recommended for enhancement. To date, only a few of these areas have been identified or

designated. Future areas will be identified on a case-by-case basis. A variety of protection and enhancement techniques are available, and the NNDFW is interested in working with the Chapter and land user to protect/enhance these habitats by providing technical assistance and possibly materials and labor. The NNDFW is interested in receiving proposals from Chapters and land users for these types of areas. Ultimately, the NNDFW maintains the authority for designating and managing biological preserves. However, the NNDFW may delegate certain management responsibilities to the local level under their oversight.

6. Recreation Areas—These areas are used for recreation that involves wildlife or has potential for development for this purpose. Recreation can involve consumptive and/or non-consumptive uses of wildlife resources and is often a part of a broader outdoor experience. Examples include fishing lakes, camping and picnic areas, and hiking trails. Several areas have been identified as Recreation Areas. Future areas will be identified on a case-by-case basis. A variety of management techniques are available, and the NNDFW is interested in working with the Chapter and land user to develop and/or manage these areas. The NNDFW is also interested in receiving proposals from Chapters and land users for these types of areas. Ultimately, the NNDFW maintains the authority for designating and managing recreational areas that involve wildlife. However, the NNDFW may delegate certain management responsibilities to the local level under NNDFW oversight. The NNDFW encourages Chapters to plan development in this area compatible with the purpose, for example, nature trails, interpretive displays, and picnic areas.

In 2011, the NNDFW began developing a long-term strategic plan to guide wildlife management in the Navajo Nation. Given the limited resources for managing and monitoring species and ecosystems, a set of highest-priority species, ecosystems, or vegetation communities were selected to focus on future NNDFW management activities (NNDNR/BIA 2021).

The 11 highest priority wildlife species identified by the NNDFW are:

1. American black bear (*Ursus americanus*)
2. bobcat (*Lynx rufus*)
3. Colorado River cutthroat trout (*Oncorhynchus clarki pleuriticus*)
4. coyote (*Canis latrans*)
5. desert bighorn sheep (*Ovis canadensis nelsoni*)
6. golden eagle (*Aquila chrysaetos*)
7. Gunnison's prairie dog (*Cynomys gunnisonii*)
8. Merriam's wild turkey (*Meleagris gallopavo merriami*)
9. mountain lion (*Puma concolor*)
10. mule deer (*Odocoileus hemionus*)
11. Rocky Mountain elk (*Cervus elaphus nelson*)

The Navajo Natural Heritage Program (NNHP), a division of the NNDFW, has implemented management plans to protect nesting ferruginous hawk (*Buteo regalis*) and Mexican spotted owl (*Strix occidentalis lucida*) populations on the Navajo Nation. Both species are of cultural significance to the Navajo Nation. The ferruginous hawk guidelines limit the level of human activity and development near occupied and unoccupied nests. The guidelines also establish a system of cataloging nest locations and criteria for

removing dilapidated nests from the catalog (NNHP 2021). Other regulations protecting species of cultural significance include the NNDFW Bald and Golden Eagle Nest Protection Regulations.

3.7.2 Effects from the Proposed Action Alternative

Under the Proposed Action, 36 percent or (576,314 acres) in the FBFA would be designated as Conservation Land Management Areas. These areas incorporate Biological Preserves, Highly Sensitive Areas, and Moderately Sensitive Areas identified in the NNDFW Wildlife Biological Resource Land Use Clearance Policies and Procedures; therefore, these areas are already subject to conservation practices. The designation of Conservation Land Management Areas is not likely to have significant effects. There would be no change in the Biological Resource Land Use Clearance Policies and Procedures and how they are implemented in the FBFA. Continued management under this policy would serve to avoid or mitigate impacts on wildlife. There would be no change to existing regulations to protect species of cultural significance.

Under the Proposed Action, Development Focus Land Management Areas would comprise approximately 6 percent (or 97,439 acres) of the FBFA and are where most surface-disturbing activities would be expected to occur—although surface disturbance could occur anywhere in the FBFA, depending on the type of development (e.g., waterlines or electric lines may cross multiple Land Management Areas). Implementing the Proposed Action would not approve any site-specific development.

Land disturbance and vegetation removal would result in wildlife habitat loss. Vegetation removal reduces the extent or quality of wildlife habitat in terms of food and cover, resulting in direct habitat loss. The effectiveness of habitat is lost when a species abandons or avoids an area. Because avoided areas meet no survival needs, the areas are no longer considered effective habitat. Periodic human activity and noise from development activities and along roads could cause animals to shift activity away from disturbed areas (Watson 2005; Hebblewhite 2011). Ground disturbance could also result in the introduction or spread of weeds that can alter habitat use and effectiveness.

Effective habitat loss can result in habitat fragmentation and interference with movement. By consolidating development near existing roads and infrastructure in Development Focus Land Management Areas, adverse effects on wildlife are reduced by minimizing habitat fragmentation. Habitat fragmentation alters wildlife distribution across the landscape and can affect many of their life functions such as feeding, courtship, breeding, and migration. The severity of impacts on wildlife would vary based on each species' life history requirements and characteristics. Species with more extensive home ranges such as mule deer, or species able to exploit a range of habitats such as small rodents, would generally be less affected by habitat loss than those with more specialized habitat requirements.

As human activities increase in the FBFA, the potential for human-wildlife encounters and conflicts increases. Possible conflicts could include human encounters with large predators, such as black bears and mountain lions. Wildlife could be injured or killed from vehicle collisions or other activities.

Potential changes to water quality and quantity could adversely affect wildlife. Disturbed soils could result in increased sedimentation in waterways. There would be the potential for accidental spills or releases, which, if substantial and near surface waters, could result in reduced water quality. Surface water quality changes could result in direct mortality of fish or depletion of food sources (e.g., aquatic

macroinvertebrates and periphyton). Changes to water quality from spills, leaks, or sedimentation would be short term since dilution would occur during downstream transport through the system. While sediment increases would also dilute during transport, slowing velocities would allow particles to settle, which could result in short- to long-term impacts to stream channel substrate composition, texture, and chemistry (Osmundson et al. 2002). Sedimentation could indirectly impact fish by reducing the quality of habitat for invertebrates that inhabit interstitial spaces of gravel streambeds and spawning habitat.

Under the Proposed Action, wildlife and habitat would be beneficially affected in the long term by integrated resource management. Management actions would include implementing protective buffers along ponds, reservoirs, lakes, streams, wetlands, and riparian zones to enhance and preserve water quality; limiting grazing access in riparian areas; restoring wetlands, riparian areas, and natural springs; conducting habitat improvement projects to provide quality habitat where it has deteriorated; and continuing monitoring efforts for sensitive wildlife and big game species. These effects are not likely to be significant.

Implementing the Proposed Action would not approve any site-specific development. Future activities or development would be permitted on a case-by-case basis and would follow the existing Biological Resource Land Use Clearance Policies and Procedures. Best management practices or additional mitigation measures would be implemented to avoid or minimize effects on wildlife and their habitats. With adherence to the existing policy and implementing BMPs and mitigation measures, no significant effects on wildlife are anticipated.

3.7.3 Effects from the No Action Alternative

Effects on wildlife from the No Action alternative would be similar to those described under the Proposed Action. There would be no change in the Biological Resource Land Use Clearance Policies and Procedures and how it is implemented in the FBFA. Continued management under this policy would serve to avoid or mitigate impacts on wildlife. There would be no change to existing regulations to protect species of cultural significance.

Development would continue to occur in the FBFA under existing tribal regulations and policies. Wildlife and their habitats would continue to be affected by habitat loss, modification, disturbance, human/wildlife encounters, and vehicle collisions.

However, under the No Action alternative, there would be no long-term beneficial effects to wildlife and habitat by implementing integrated resource management. Management actions such as implementing protective buffers along ponds, reservoirs, lakes, streams, wetlands, and riparian zones to enhance and preserve water quality; limiting grazing access to riparian area; restoring wetlands, riparian areas, and natural springs; conducting habitat improvement projects to provide quality habitat where it has deteriorated; and continuing monitoring efforts for sensitive wildlife and big game species would not be applied.

3.8 Agriculture

3.8.1 Affected Environment

The Navajo Nation and the BIA are responsible for managing all agricultural activity on the Navajo Nation as regulated by the AIARMA (25 USC §§ 3711, 3712, and 3715; 25 CFR Part 167; and NNC Title 3. These regulations are designed to preserve natural resources in the Navajo Nation. The management of rangeland resources and dryland farms is supported by the Navajo District Grazing Committees, Navajo Nation Resource Development Committee, and the Navajo Nation Western Farm Board supports the irrigated farms/croplands. These two entities comprise local elected members of the community that serves as a conduit between the government and the agricultural producers.

There are numerous cropland areas where a variety of traditional crops are grown. The Tuba City/Moenkopi Irrigation project is in the Kerley Valley area of the FBFA. The irrigation area is utilized by the Navajo and Hopi tribal members. This irrigation project is considered an intermittent water source, as its source is diverted from the Moenkopi Wash by a historic diversion dam. In the croplands, west of Tuba City, are small spring-fed irrigation projects and orchards and vineyards. Most of the crops grown in these areas are for seasonal consumption and personal use by the families who grow the crops. Crops not used by the immediate families are marketed locally along roadways and at flea markets and seasonal farmers' markets (NNDNR/BIA 2021).

Primary crops in the FBFA are corn, vegetables, melons, and squash, with a small number of farms producing hay and silage for livestock feed (USDA 2019). Of the nine chapters in the FBFA, Bodaway-Gap, Tonalea, Tuba City, and Kaibeto reported the largest number of farms in the 2017 USDA Agricultural Census, respectively. Cameron, Tolani Lake, and Leupp reported the fewest farms, respectively, with Cameron reporting zero farms in 2017 (USDA/NASS 2019).

Agricultural Land Use Permits (ALUPs) were established on the Navajo Nation for the purposes of:

- Demonstrating methods of agricultural production, farm management and crop marketing, irrigation management, and other measures
- Promoting accurate agricultural product and land management recordkeeping
- Monitoring and preventing plant disease
- Protecting the Navajo Nation's food supply and agricultural markets

There are two types of ALUPs depending on whether the land is irrigated or not. ALUPs enable permit holders to use specific land areas for agricultural use, such as crop cultivation, greenhouses, irrigation, and related agricultural activities.

Administration and processing of ALUPs are authorized by 25 USC § 3715 and NNC Title 3 Farm Board Sections 61-69, 151-154, 171-176 (clustered farmlands). The BIA management of Navajo ALUPs is authorized under Article V of the Treaty with the Navajo Tribe of Indians of June 1, 1868.

The District Grazing Committees oversee scattered/dryland farmlands across the Navajo Nation. The District Grazing Committee and Major Irrigation Farm Board have the authority to enforce and carry out the management duties and responsibilities for small, irrigated projects and scattered farm acreage within

their districts. Whereas the applications for irrigated farmlands for the Tuba City/Moenkopi Irrigation Project (i.e., historic Vanzee and Moenave farmlands) are submitted through the Western Agency's Major Irrigation Farm Board (NNDNR/BIA 2021).

In the FBFA area of Western Navajo Agency, 201 ALUPs have been issued, encumbering 1,190 acres of Tribal Trust land (NNDNR/BIA 2021).

3.8.2 Effects from the Proposed Action Alternative

Under the Proposed Action, the main goal is to maximize development, productivity, and economical use of local farmland and irrigation water systems while ensuring their protection, conservation, and sustainability. Agriculture Land Use Permits would continue to be maintained and permitted in the FBFA. Less than 0.01 percent of the FBFA is currently encumbered under active ALUPs. With the addition of future planned actions such as the Cameron Chapter Cameron Farm Enterprise, approximately 3 percent of the FBFA would be actively farmed. The Agricultural Land Management Areas identified under the Proposed Action include open space for agriculture and livestock grazing and comprise approximately 57 percent of the FBFA. Conservation Areas and Development Focus Areas would also allow for ALUPs or other agriculture.

Under the Proposed Action, agricultural areas of concern would be identified for restoration to preserve productive areas. Restoration or conservation projects would be monitored and maintained. Best management practices would also be initiated to identify and prevent the expansion of existing infestations of target weed species and quickly prevent the spread of new high-priority weed species in the FBFA. In the future, an Agricultural Resource Management Plan, Cropland Management Plan, and individual conservation plans would be developed to address site-specific BMPs and other actions to ensure resource protection and sustainability. The Proposed Action does not approve any restoration/conservation projects or management plans. Those will be subject to separate NEPA analyses.

The Proposed Action would implement integrated management actions related to soils, water, noxious/invasive weeds, and other resources to meet land management goals. Additional management actions related to agriculture identified under the Proposed Action include:

- Inventorying/managing ALUPs and monitoring annually for adherence
- Developing different types of irrigated and dryland farming practices to maximize production and improve air, water, plant, and soil quality using USDA NRCS conservation practices
- Utilizing NRCS-approved conservation practices to promote best management practices to Navajo farmers
- Utilizing management strategies to increase crop yields based on USDA NRCS and Cooperative Extension programs

Applying these management actions would have beneficial long-term effects on agriculture in the FBFA. These effects on agriculture are not likely to be significant.

3.8.3 Effects from the No Action Alternative

Agriculture Land Use Permits would continue to be maintained and permitted in the FBFA. However, the integrated management actions related to soils, water, noxious/invasive weeds, and other resources to meet land management goals would not be applied. The beneficial long-term effects on agriculture from implementing these management actions would not occur.

3.9 Livestock Grazing

3.9.1 Affected Environment

Livestock production is an important industry in terms of economic benefit and a cultural way of life for the Navajo people. Maintaining the long-term viability of rangelands is essential for supporting the long-term health of livestock, and the long-term financial gains of permit holders, many of whom depend on grazing as an important source of livelihood. Viable rangelands also provide for the continued health of the environment by supporting healthier air, water, and soil resources.

Land Management Districts (LMDs), also known as Grazing Districts, were established for the Navajo Nation in 1937 (NNDNR/BIA 2021). The LMDs in the FBFA are shown on Map A-9 in Appendix A. In addition, the LMDs were established so administrators could better address Navajos' problems and interests on a smaller scale than the Navajo Nation as a whole. The FBFA is situated in three Land Management Districts—1, 3, and 5. Livestock grazing on the Navajo Nation requires an individual to possess a valid grazing permit issued by the BIA based on a Navajo Nation District Grazing Committee's recommendation.

Stocking rates are correlated with carrying capacities in the LMDs to prevent overgrazing. The carrying capacities within the LMDs in the FBFA were determined by rangeland inventories which are based on Ecological Site Descriptions utilizing NRCS methodology. Livestock, wildlife, and feral Navajo free-ranging horses graze different forage species and have different manners of grazing. Navajo Nation grazing permit holders must reserve 25 percent of available forage in their customary use areas for wildlife (NNDNR/BIA 2021). NRCS and local range management experts recommend reserving 50 percent of the available forage to provide adequate leaf and root mass to produce more forage, maintain plant health, protect the soil, and for wildlife (NNDNR/BIA 2021). The rangeland inventories were conducted for LMD 5 in 2007 and 2016, LMD 1 and 3-2 in 2008 and 2015, and LMD 3 in 2014. Range inventories are used to determine range trends and conditions.

If a site has too many animals on it for too long, desired forage species for each animal will become overgrazed. Over-stocked rangeland can become overgrazed, which weakens the ability of preferred forage species to reproduce and regrow on a site, resulting in a reduction of their percent composition. If such losses continue, noxious weeds and other disturbance-prone plant species can re-colonize, reducing the forage availability.

In the FBFA, 723 Navajo Grazing Permits allow for 43,024 Sheep Units Year Long (SUYL) (NNDNR/BIA 2021). Each SUYL is defined as one ram, or one ewe and her un-weaned lamb. An annual grazing permit compliance check found a total of 57 grazing permits in the FBFA were non-compliant

(over-stocked), and 90 permits were in dispute at the time of the check (NNDNR/BIA 2021). Table 3-4 lists the Land Management District 3 livestock tally count records.

Table 3-4. Land Management District 3 Livestock Tally Count Records for 2019 and 2020

	2019/Sheep	2019/Cattle	2019/Horses	2020/Sheep	2020/Cattle	2020/Horses
LMD 3-1	439	578	84	482	677	97
LMD 3-2	1,006	1,334	69	627	1,179	47
LMD 3-3	1,457	867	48	1,093	518	32
LMD 3-4	762	454	65	830	458	53
Total	3,664	3,233	266	3,032	2,832	229

3.9.2 Effects from the Proposed Action Alternative

The Draft IRMP identifies several goals to better manage rangeland and livestock grazing. These include implementing integrated management activities that maintain or improve the ecological health of Navajo rangeland. Another goal is to keep Navajo producers (ranchers and farmers) in compliance with the current Navajo Nation Standard Operating Plan, Plan of Operation and Procedures, and Navajo Grazing Regulations by ensuring the enforcement of Navajo Nation grazing regulations and permit requirements.

Open rangeland for grazing, wildlife, and overall ecological health would be retained under the Proposed Action. The Agricultural Land Management Areas identified under the Proposed Action include open space for agriculture and livestock grazing and comprise approximately 57 percent of the FBFA. Grazing would also continue in Conservation Land Management Areas as permitted. Additionally, while Development Focus Land Management Areas are identified for development—livestock grazing would continue in those areas as development is not expected to encompass all the areas classified for this use. The Proposed Action would also restrict large developments such as solar and wind projects to areas where grazing is not conducive to retain functional rangeland for grazing.

Future actions in the FBFA would include land withdrawals for development, scattered homesites, or agriculture. Grazing may also be restricted from riparian areas, restoration areas, or lands identified for preservation. The amount and location of this acreage are unknown, but these actions would decrease the amount of land and forage available for livestock grazing and could result in changes to stocking rates for current grazing permits. Under the Proposed Action, procedures would be established to determine if adjusting stocking rates and/or carrying capacities is necessary based on land withdrawal data and to communicate changes to stakeholders (25 CFR Part 167 Section 167.9 A-E). LMDs would be evaluated to determine if they need to be revised to protect rangelands in the Navajo people's best interest.

Under the Proposed Action, a Former Bennett Freeze District Grazing Committee (FBF DGC) would be established to pass resolutions and make decisions on grazing and dryland farming and provide recommendations to the BIA and the Navajo Nation Department of Agriculture. The BIA and Navajo Nation Department of Agriculture, in coordination with the FBF DGC, would establish a Livestock Management Program to directly manage all livestock within the FBFA within 2 calendar years from the Navajo Nation’s adoption of the IRMP. Unauthorized livestock includes, but is not limited to, unbranded, unpermitted, and free-ranging livestock, such as Navajo free-ranging horses. This program would conduct

a comprehensive, accurate, and independent livestock tally for use as a tool to reduce the number of unauthorized livestock. Implementing the Proposed Action does not establish a Livestock Management Program, which would require action by the FBF DGC and additional NEPA analysis.

The Proposed Action would apply management actions to improve or repair livestock water features and structures, such as ponds, tanks, windmills, and actions to install or repair range unit fencing. Available technology would continue to be used to evaluate and monitor the condition of rangeland and range inventories, and monitoring would continue to be completed every 10 years. The Rangeland Health Monitoring Handbook (NDA 2005), Draft BIA Range and Agricultural Range Handbook, and RMPs would be updated to provide landscape-wide standards for consistent data collection and range monitoring. These actions would serve to better manage rangeland health and grazing and could result in beneficial effects, which are not likely to be significant.

While drought, fire, or other unpredictable events may contribute to declining rangeland health in the FBFA, applying actions to better manage grazing and rangeland health would serve to limit these adverse effects. BMPs would be established and implemented for grazing livestock to minimize climate effects.

Implementation of the IRMP is expected to improve grazing permit compliance, communication and coordination, grazing management, and eventually the overall rangeland ecological health in the FBFA. Grazing management would be planned and applied to increase the vigor of preferred plant species, improve soil and site stability, and hydrologic functioning, resulting in long-term beneficial effects to rangeland health. While these effects are too remote in time to be, implementing these practices has been shown to improve or maintain the health and vigor of selected plants and maintain a stable and desired plant community while, at the same time, maintain or improve water quality and quantity, reduce accelerated soil erosion, and maintain or improve soil condition for sustainability of the resource (USDA/NRCS 2003). The Proposed Action would have no significant adverse effects on rangeland or livestock grazing.

3.9.3 Effects from the No Action Alternative

Under the No Action alternative, existing rangeland management and livestock grazing would continue in the FBFA. Unauthorized grazing use would likely continue to occur. Future actions in the FBFA would include land withdrawals for development, scattered homesites, or agriculture. The amount and location of this acreage is unknown, but these actions would decrease the amount of land and forage available for livestock grazing and increase grazing pressure. Overgrazing from both authorized and unauthorized livestock would lead to diminished vegetative cover and production, reductions in soil and site stability, and compromised hydrological functioning. Rangeland health is likely to depart from the physical and biological conditions needed to maintain healthy, functioning rangelands. Drought, fire, or other events may also contribute to declining rangeland health. These effects would be long-term but are not likely to be significant since existing livestock management policy would continue, and existing permits may need to be modified to reduce stocking rates to offset adverse effects. Available technology would continue to be used to evaluate and monitor the condition of rangeland and range inventories, and monitoring would be completed every 10 years, as required.

However, under this alternative, an FBF DGC would not be established to pass resolutions and make decisions on grazing and dryland farming, provide recommendations to the BIA and the Navajo Nation

Department of Agriculture, or take action on establishing a Livestock Management Program to directly manage all livestock within the FBFA. Unauthorized livestock would likely not be reduced since a comprehensive, accurate, and independent livestock tally would not be conducted.

Actions to improve or repair livestock water features and structures, such as ponds, tanks, and windmills or install or repair range unit fencing would not be implemented. The Rangeland Health Monitoring Handbook (NNDA 2005), Draft BIA Range and Agricultural Range Handbook, and Range Management Plans would not be updated.

The beneficial long-term effects from improved grazing permit compliance, communication and coordination, and grazing management in the FBFA are not expected to occur, and rangeland health is unlikely to improve.

3.10 Special Status Species

Under the Proposed Action, approximately 576,314 acres in the FBFA would be designated as Conservation Land Management Areas. These areas incorporate Biological Preserves, Highly Sensitive Areas, and Moderately Sensitive Areas as identified in the NNDFW Wildlife Biological Resource Land Use Clearance Policies and Procedures; therefore, these areas are already subject to conservation practices. There would be no change in the Biological Resource Land Use Clearance Policies and Procedures and how it is implemented in the FBFA. Continued management under this policy would serve to avoid or mitigate impacts on wildlife. There would be no change to existing regulations to protect species of cultural significance. A Programmatic Biological Evaluation was prepared to analyze the potential effects to federally and tribally listed threatened, endangered, proposed, or otherwise sensitive species (Ecosphere 2021). Any future proposed development would be assessed for threatened, endangered, or other sensitive species. Navajo Natural Heritage Program, a division of the NNDFW, would issue a Biological Resources Compliance Form for final approval, disapproval, or additional mitigation measures required for any future proposed development.

3.10.1 Affected Environment

The FBFA contains potential habitat for 46 US Fish and Wildlife Service (USFWS) threatened, endangered, or candidate species or Navajo Endangered Species List (NESL)-listed species. There are four USFWS designated final critical habitats for federally listed species partially or wholly within the FBFA. Navajo endangered species include NNHP and federally protected, candidate, and other rare or otherwise sensitive species.

3.10.2 Effects from the Proposed Action Alternative

The Programmatic Biological Evaluation contains detailed descriptions of the special status species with the potential to occur in the FBFA and the potential effects on those species from adopting the IRMP (Ecosphere 2021). The types of effects to federally or tribally listed species that could occur from implementing management actions could include:

- Ground and vegetation disturbance and resulting habitat alteration or loss, habitat improvement, soil erosion from wind and water

- Disturbance from increased traffic, noise, dust, and emissions in localized areas
- The potential for spills of petroleum products or industrial fluids may affect surface or groundwater quality
- Potential injury or mortality from vehicles or equipment
- Water depletions

The purpose of the IRMP is to improve the management and protection of natural resources on the FBFA. Therefore, the management activities are intended to have beneficial consequences for natural resources with minimal adverse effects. Adherence to species-specific avoidance measures, presence/absence surveys, and site-specific analyses and biological evaluations in compliance with Navajo Nation regulations and the ESA will avoid or minimize impacts or effects to USFWS-listed and NESL species.

Table 3-5 lists the federally threatened, endangered, and candidate species evaluated in the Biological Evaluation and the preliminary effects determinations resulting from the analysis.

Table 3-5. Federally Listed Species Evaluated and Preliminary Effect Determinations

Species	Status	Effects Determination
Black-footed ferret (<i>Mustela nigripes</i>)	Experimental Population, Non-Essential; NESL Group 1	No effect
California condor (<i>Gymnogyps californianus</i>)	Experimental population, non-essential population; NESL Group 4 species	Not likely to jeopardize the continued existence of the species
Mexican spotted owl (<i>Strix occidentalis lucida</i>)	Threatened; NESL Group 3 species	May affect not likely to adversely affect
Mexican spotted owl	Critical habitat	No effect
Southwestern willow flycatcher (<i>Empidonax traillii eximius</i>)	Endangered; NESL Group 2	May affect not likely to adversely affect
Humpback chub (<i>Gila cypha</i>)	Endangered; NESL Group 2	May affect not likely to adversely affect
Humpback chub	Critical habitat	May affect not likely to adversely affect
Razorback sucker (<i>Xyrauchen texanus</i>)	Endangered; NESL Group 2	May affect not likely to adversely affect
Razorback sucker	Critical habitat	May affect not likely to adversely affect
Apache trout (<i>Oncorhynchus apache</i>)	Threatened	No effect
Monarch butterfly (<i>Danaus plexippus</i>)	Candidate	May affect, but would not jeopardize the continued existence of the species
Kanab ambersnail (<i>Oxyloma haydeni kanabensis</i>)	Endangered	May affect not likely to adversely affect
Brady Pincushion Cactus (<i>Pediocactus bradyi</i>)	Endangered; NESL Group 2	May affect not likely to adversely affect
Fickeisen plains cactus (<i>Pediocactus peeblesianus fickeiseniae</i>)	Endangered; NESL Group 2	May affect not likely to adversely affect
Navajo sedge (<i>Carex specuicola</i>)	Threatened; NESL Group 2	May affect not likely to adversely affect
Welsh's milkweed (<i>Asclepias welshii</i>)	Threatened; NESL Group 3	May affect not likely to adversely affect

Species	Status	Effects Determination
Sentry milkvetch (<i>Astragalus cremnophylax</i> var. <i>cremnophylax</i>)	Threatened	No effect

Notes: NESL = Navajo Endangered Species List

Group 1 species are those species or subspecies that no longer occur on the Navajo Nation.

Group 2 species are considered endangered, or a species or subspecies whose prospects of survival or recruitment on the Navajo Nation are in jeopardy.

Group 3 species are those species whose prospects of survival or recruitment are likely to be in jeopardy in the foreseeable future.

Group 4 species are those species for which the NNDFW does not currently have sufficient information to support it being listed as Group 2 or Group 3 but has reason to consider them.

Table 3-6 lists the Navajo Nation special status species evaluated in the Biological Evaluation and the preliminary effects determinations resulting from the analysis.

Table 3-6. Navajo Nation Special Status Species Evaluated and Preliminary Effects Determinations

Species	Status	Effects Determination
Chisel-toothed kangaroo rat (<i>Dipodomys microps</i>)	NESL Group 4	May impact individuals, no population level effects
Mountain sheep (<i>Ovis canadensis</i>)	NESL Group 4	May impact individuals, no population level effects
Pronghorn (<i>Antilocapra americana</i>)	NESL Group 3	May impact individuals, no population level effects
Townsend's big-Eared bat (<i>Corynorhinus townsendii</i>)	NESL Group 4	May impact individuals, no population level effects
Wupatki pocket mouse (<i>Perognathus amplus cineris</i>)	NESL Group 4	May impact individuals, no population level effects
Bald eagle (<i>Haliaeetus leucocephalus</i>)	NESL Group 2	May impact individuals, no population level effects
Belted kingfisher (<i>Ceryle alcyon</i>)	NESL Group 4	May impact individuals, no population level effects
Burrowing owl (<i>Athene cunicularia</i>)	NESL Group 4	May impact individuals, no population level effects
Ferruginous hawk (<i>Buteo regalis</i>)	NESL Group 3	May impact individuals, no population level effects
Golden eagle (<i>Aquila chrysaetos</i>)	NESL Group 3	May impact individuals, no population level effects
Mountain plover (<i>Charadrius montanus</i>)	NESL Group 4	May impact individuals, no population level effects
Peregrine falcon (<i>Falco peregrinus</i>)	NESL Group 4	May impact individuals, no population level effects
Sora (<i>Porzana carolina</i>)	NESL Group 3	May impact individuals, no population level effects
Yellow warbler (<i>Dendroica petechia</i>)	NESL Group 4	May impact individuals, no population level effects
Chuckwalla (<i>Sauromalus ater</i>)	NESL Group 4	May impact individuals, no population level effects

Species	Status	Effects Determination
Northern leopard frog (<i>Lithobates pipiens</i>)	NESL Group 2	May impact individuals, no population level effects
Bluehead sucker (<i>Catostomus discobolus</i>)	NESL Group 2	May impact individuals, no population level effects
Alcove bog orchid (<i>Platanera zothecina</i>)	NESL Group 3	May impact individuals, no population level effects
Alcove Death Camus (<i>Anticlea vaginatus</i>)	NESL Group 3	May impact individuals, no population level effects
Alcove death camus (<i>Anticlea vaginatus</i>)	NESL Group 3	May impact individuals, no population level effects
Beath's milkvetch (<i>Astragalus beathii</i>)	Sensitive species	No impact
Cave primrose (<i>Primula specuicola</i>)	Sensitive species	May impact individuals, no population level effects
Grand Canyon goldenweed (<i>Ericameria arizonica</i>)	Sensitive species	No impact
Marble Canyon dalea (<i>Psorothamnus arborescens</i> var. <i>pubescens</i>)	NESL Group 3	No impact
Marble Canyon milkvetch (<i>Astragalus cremnophylax</i> var. <i>hevronii</i>)	NESL Group 4	No impact
Peebles' blue star (<i>Amsonia peeblesii</i>)	NESL Group 4	No impact
Round dunebroom (<i>Errazurizia rotundata</i>)	NESL Group 3	No impact
Rydberg's thistle (<i>Cirsium rydbergii</i>)	NESL Group 4	May impact individuals, no population level effects
Parish's alkali grass (<i>Puccinellia parishii</i>)	NESL Group 4	May impact individuals, no population level effects
Welsh's American aster (<i>Symphotrichum welshii</i>)	NESL Group 4	May impact individuals, no population level effects

Notes: NESL = Navajo Endangered Species List

Group 2 species are considered endangered, or a species or subspecies whose prospects of survival or recruitment on the Navajo Nation are in jeopardy.

Group 3 species are those species whose prospects of survival or recruitment are likely to be in jeopardy in the foreseeable future.

Group 4 species are those species for which the NNDFW does not currently have sufficient information to support it being listed as Group 2 or Group 3 but has reason to consider them.

3.10.3 Effects from the No Action Alternative

Under the No Action Alternative, there would be no effects to special status species. There would be no change in the Biological Resource Land Use Clearance Policies and Procedures and how it is implemented in the FBFA. Continued management under this policy would serve to avoid or mitigate impacts on wildlife. There would be no change to existing regulations to protect species of cultural significance. Any future proposed development would be assessed for threatened, endangered, or other sensitive species. The Navajo Natural Heritage Program, a division of the NNDFW, would issue a

Biological Resources Compliance Form for final approval, disapproval, or additional mitigation measures required for any future proposed development.

4. Consultation/Coordination

Consultation was conducted in compliance with Section 7 of the ESA and Section 106 of the National Historic Preservation Act. Consultation processes are discussed in the following sections, including the results of consultation efforts.

4.1 Section 7 Consultation

As part of this PEA, the BIA consulted with the United States Fish and Wildlife Service (USFWS) and the Navajo Natural Heritage Program regarding potential effects to threatened and endangered species, as required under Section 7 of the ESA. A Biological Evaluation was prepared to evaluate the impacts to listed species, species proposed for listing, and critical habitats from the Proposed Action. The Biological Evaluation identified environmental protection measures to minimize impacts on these species and habitats. The Biological Evaluation was submitted to the USFWS and NNHP for their concurrence in May 2021.

4.2 Section 106 Consultation

Section 106 of the National Historic Preservation Act of 1966 requires federal agencies to consider the effects of their undertakings on historic properties and afford the Advisory Council on Historic Preservation a reasonable opportunity to comment. For the Proposed Action, Section 106 of the National Historic Preservation Act compliance and consultation would occur on a case-by-case basis when site-specific projects are proposed.

On February 5, 2021, a letter and map describing the Proposed Action and inviting consultation with the BIA Navajo Region were sent to each of the various Pueblos and tribes listed in Table 4-1. The letter encouraged tribes to respond regarding their interest in consulting with BIA on potential effects from the action addressed in the PEA for the FBFA IRMP. The BIA received no responses to the letter.

Table 4-1. Pueblos and Tribes Sent Consultation Requests from the Bureau of Indian Affairs

Tribe/Pueblo	Name
Navajo Nation	President Johnathan Nez
San Juan Southern Paiute	President Michael King
Pueblo of Zuni	Governor Val R. Panteah, Sr.

5. List of Preparers

The BIA and Navajo Nation established an IDT made up of staff specialists who developed the PEA. The BIA worked with a third-party contractor to develop the content and analysis in the PEA. The IDT is listed in Table 5-1.

Table 5-1. Interdisciplinary Team Members

Name	Agency	Title
Renee Benally	Bureau of Indian Affairs	Contracting Officer's Representative, Project Lead
Tony Robbins	Bureau of Indian Affairs	Alternate Contracting Officer's Representative
Calvert Curley, DBA	Bureau of Indian Affairs	Natural Resources Lead
Casey Francisco	Bureau of Indian Affairs	Resource Specialist
Robert Begay	Bureau of Indian Affairs	Cultural Resources Lead
Leonard Notah	Bureau of Indian Affairs	Environmental Quality Act Compliance Review
Dr. Rudy Shebala	Navajo Nation	Executive Director Division of Natural Resources
Vangie Curley-Thomas	Navajo Nation	Deputy Director Division of Natural Resources
Cheryl Curley	Bureau of Indian Affairs	Tribal Operation's Specialist (Tribal Liaison)
Peter Lefebvre	Bureau of Indian Affairs	Soil Specialist Lead
Evan Blackstone	Office of the Solicitor	Attorney-Adviser
Richard Begay	Navajo Nation	Department Manager Navajo Heritage and Historic Preservation
Crystal Tulley-Cordova, PhD	Navajo Nation Department of Water Resources	Principal Hydrologist

A list of third-party preparers who participated in this PEA development is provided in Table 5-2.

Table 5-2. List of Third-Party Preparers and Qualifications

Name/Title	Organization	Project Roles/Responsibilities	Qualifications
Joey Herring	Ecosphere Environmental Services, Inc.	Project Manager, NEPA lead, and technical author	BS Environmental Biology/25 years of experience
Jerusha Rawlings	Ecosphere Environmental Services, Inc.	Assistant Project Manager, technical author	Ph.D. Biology/Landscape Ecology; BS Biology/Ecology and Systematics/25 years of experience
Schuyler Roskam	Ecosphere Environmental Services, Inc.	Technical author	BS Biological Sciences/2 years of experience

Name/Title	Organization	Project Roles/Responsibilities	Qualifications
Anna Riling	Ecosphere Environmental Services, Inc.	Geographic information systems analysis, mapping	MS Geographic Information Science; BS Geology/17 years of experience
Heather Parmeter	Ecosphere Environmental Services, Inc.	Technical author	BS Biology; MS Biology/20 years of experience
John Dodge	Ecosphere Environmental Services, Inc.	Threatened and endangered species analysis	BS Environmental Biology/24 years of experience
Wanda White	Ecosphere Environmental Services, Inc.	Administrative Record	Administrative Assistant/47 years of experience
Cindy Lancaster	Ecosphere Environmental Services, Inc.	Technical editor and 508 compliance	BS English/36 years of experience
Doug Loebig	Stratified Archaeological and Environmental Services	Cultural Resources Literature Review and analysis	MA Anthropology; BA Anthropology; Register of Professional Archaeologists and State Registered Principal Investigator/20 years of experience
Jeff Moffett	Triple Point Strategic Consulting, LLC	Socioeconomic analysis	Ph.D. Quantitative Resource Management; MS Forest Economics; BA Economics and Religion/36 years of experience
Joanna Austin-Manygoats		Interpreter and translator	Certified Navajo Interpreter and Translator/29 years of experience

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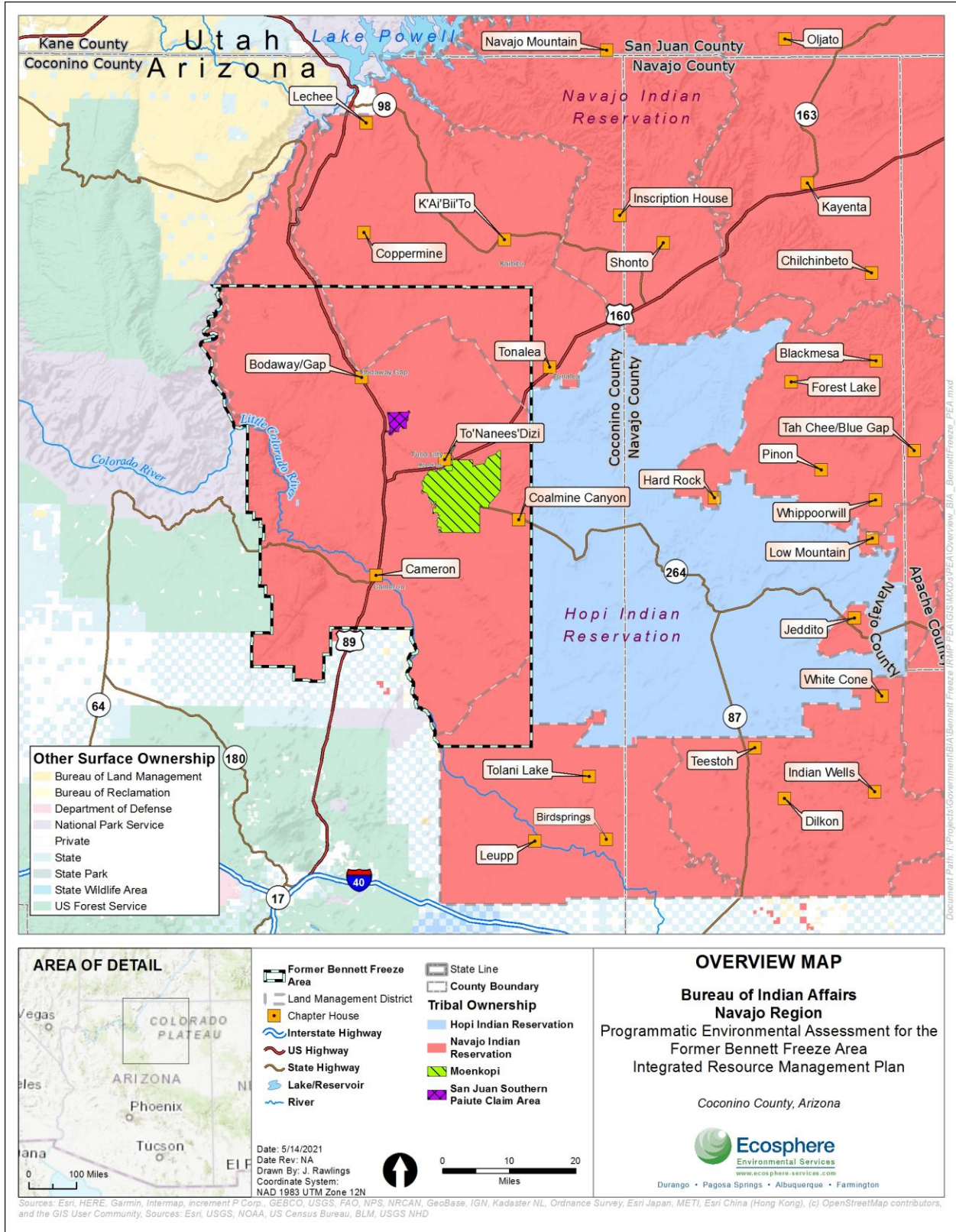
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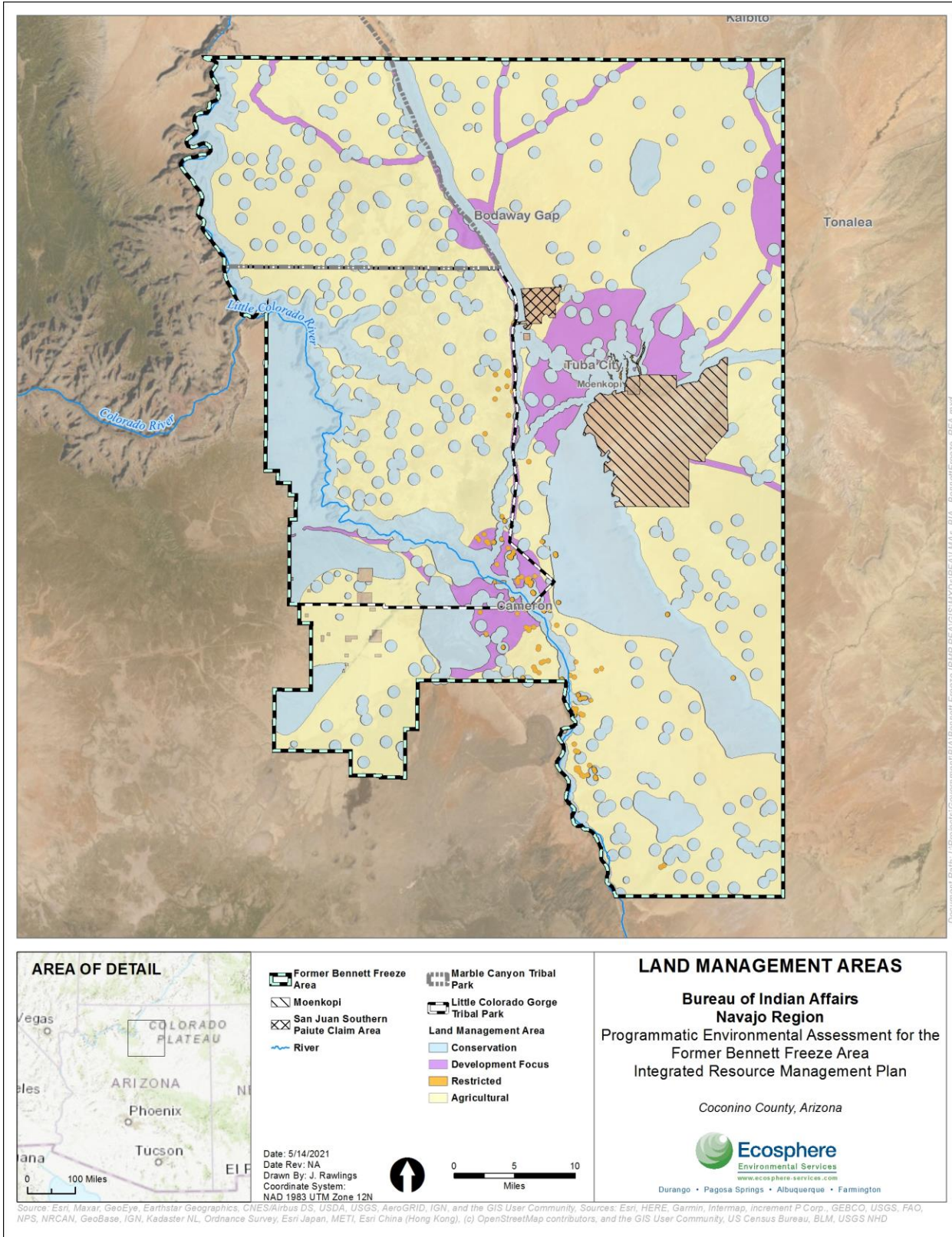
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WHPacific, Inc. 2008j. Tuba City Chapter Comprehensive Land Use Plan. Prepared for the Navajo Nation Division of Community Development Design and Engineering Services.

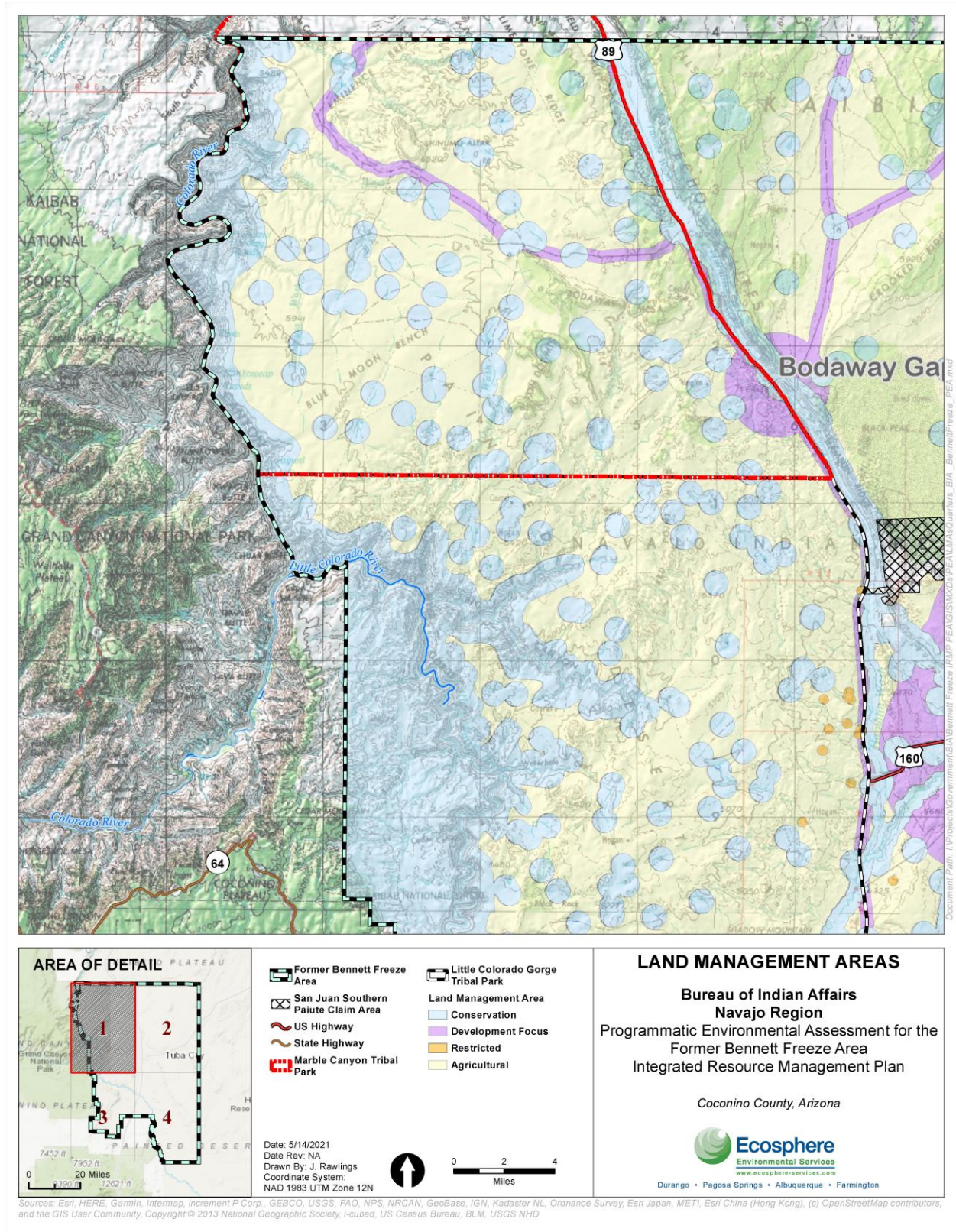
Appendix A – Maps



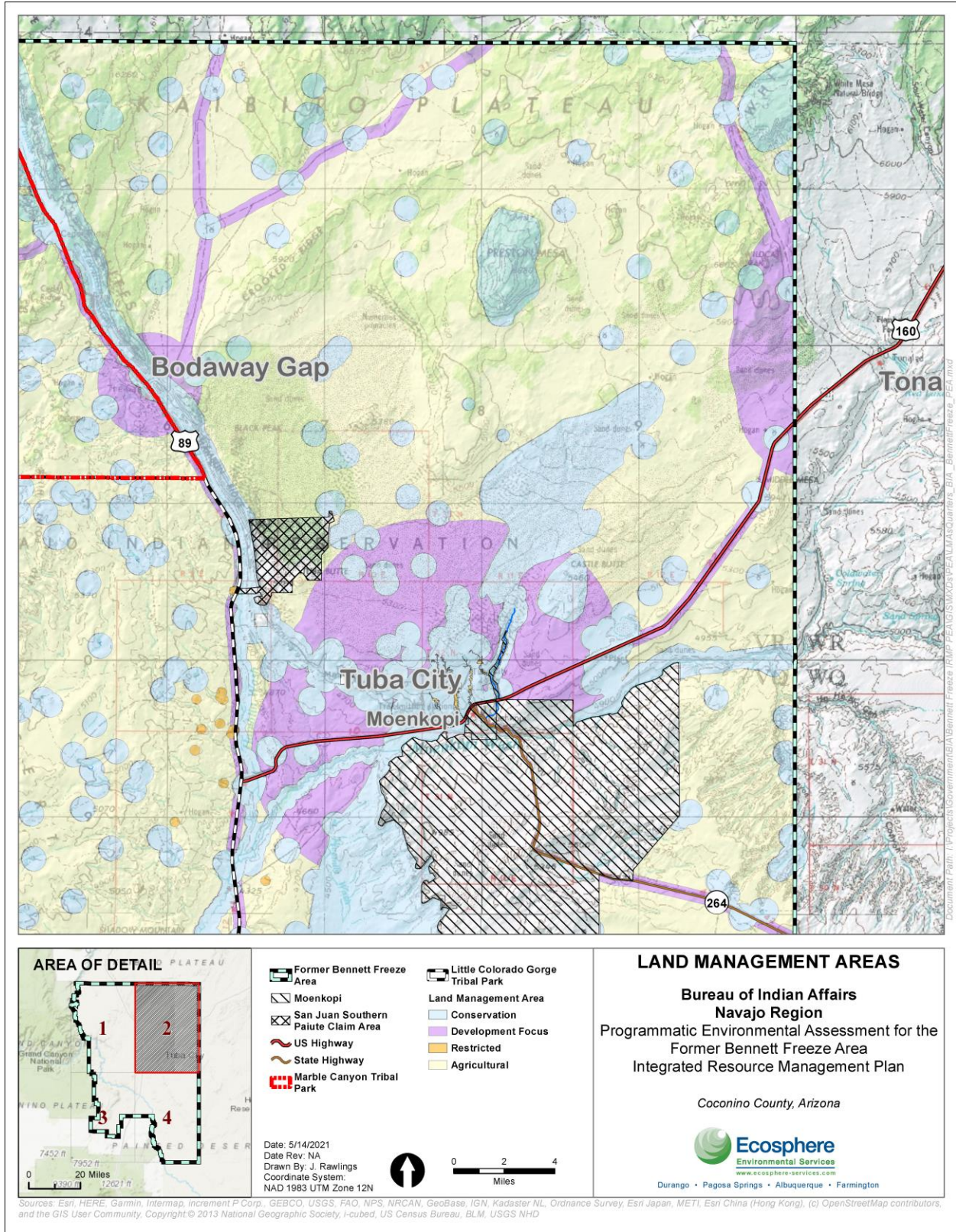
Map A-1. Overview of the Former Bennett Freeze Area



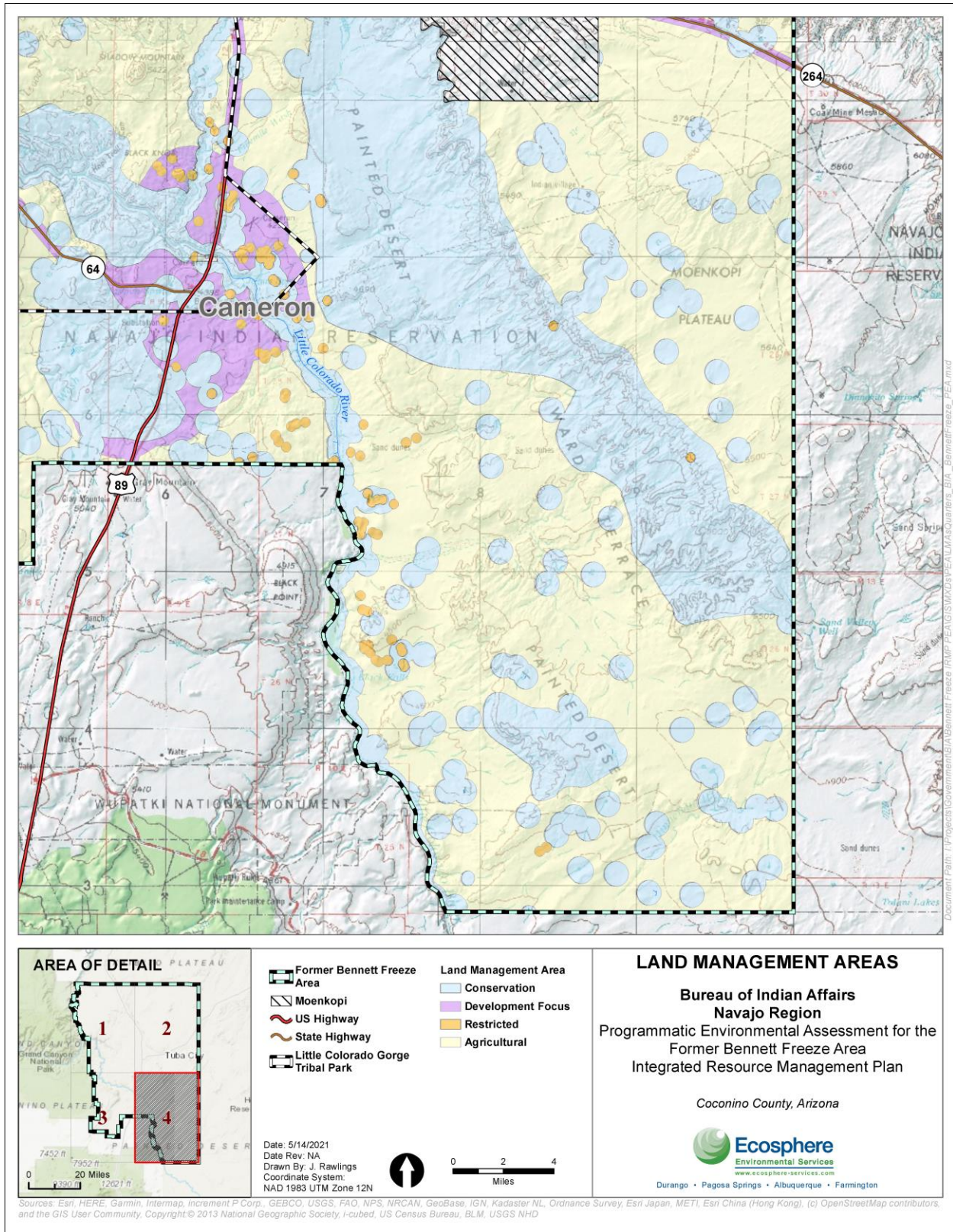
Map A-2. Proposed Land Management Areas in the Former Bennett Freeze



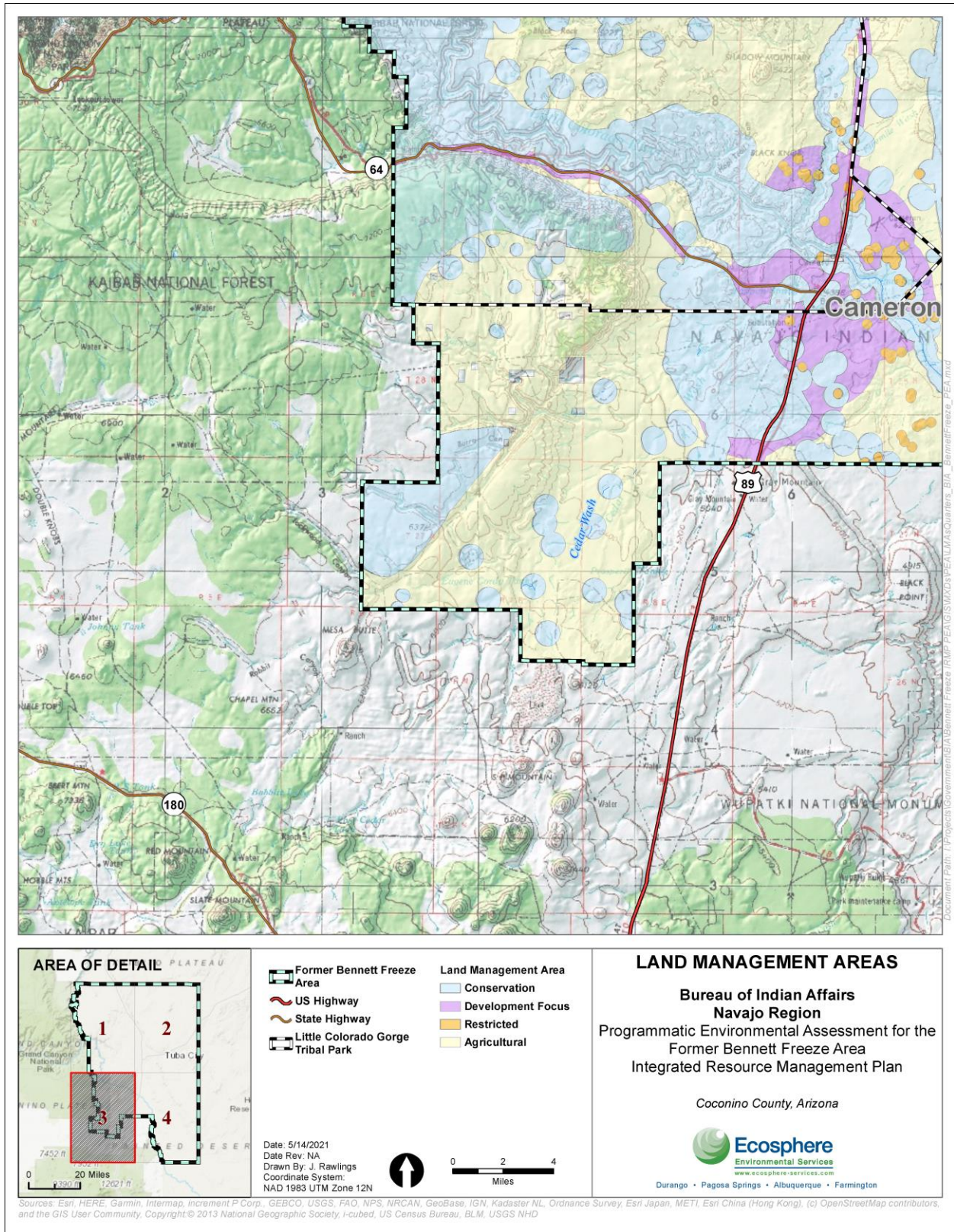
Map A-3. Proposed Land Management Areas in the Former Bennett Freeze Area NW Quarter



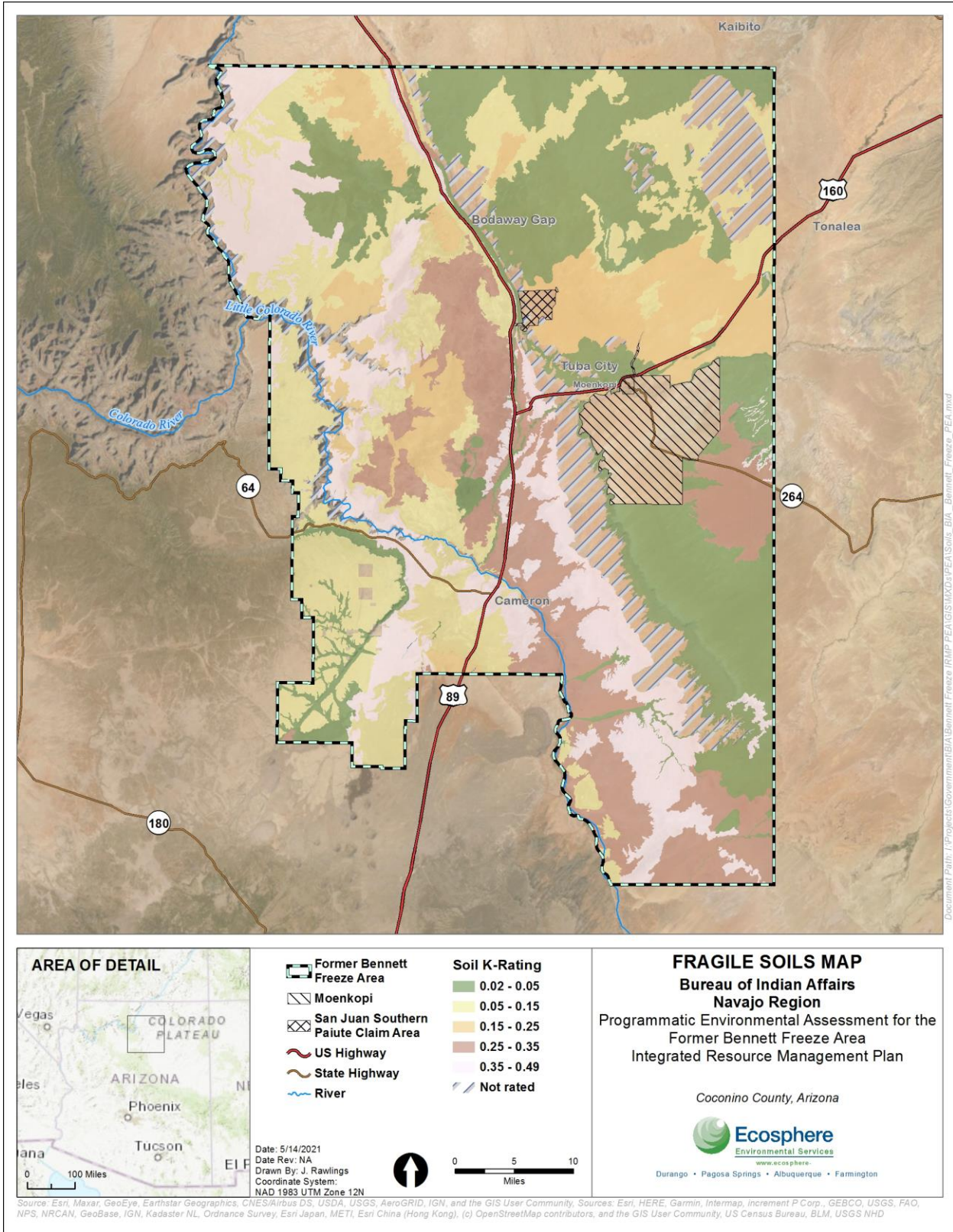
Map A-4. Proposed Land Management Areas in the Former Bennett Freeze Area NE Quarter



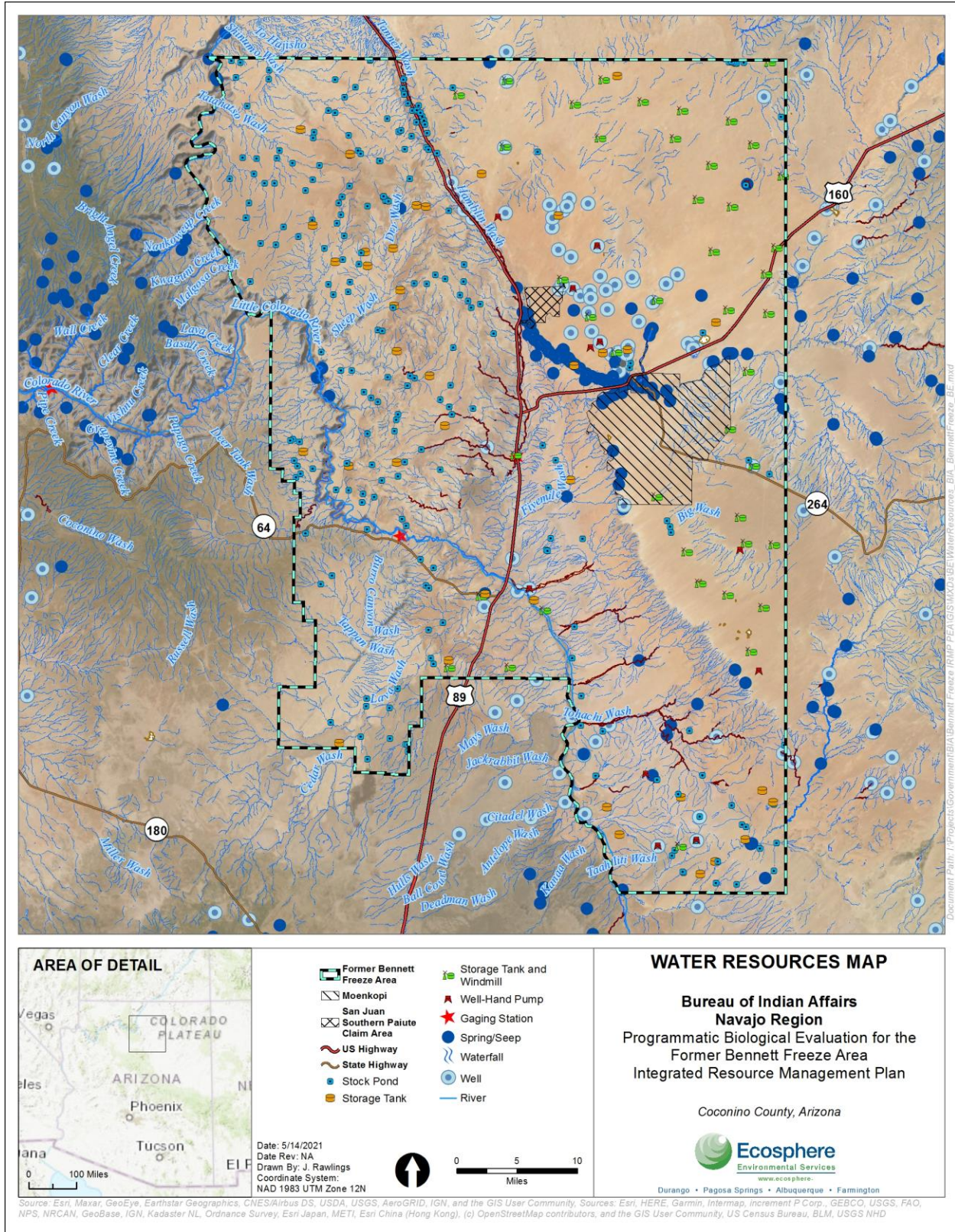
Map A-5. Proposed Land Management Areas in the Former Bennett Freeze Area SE Quarter



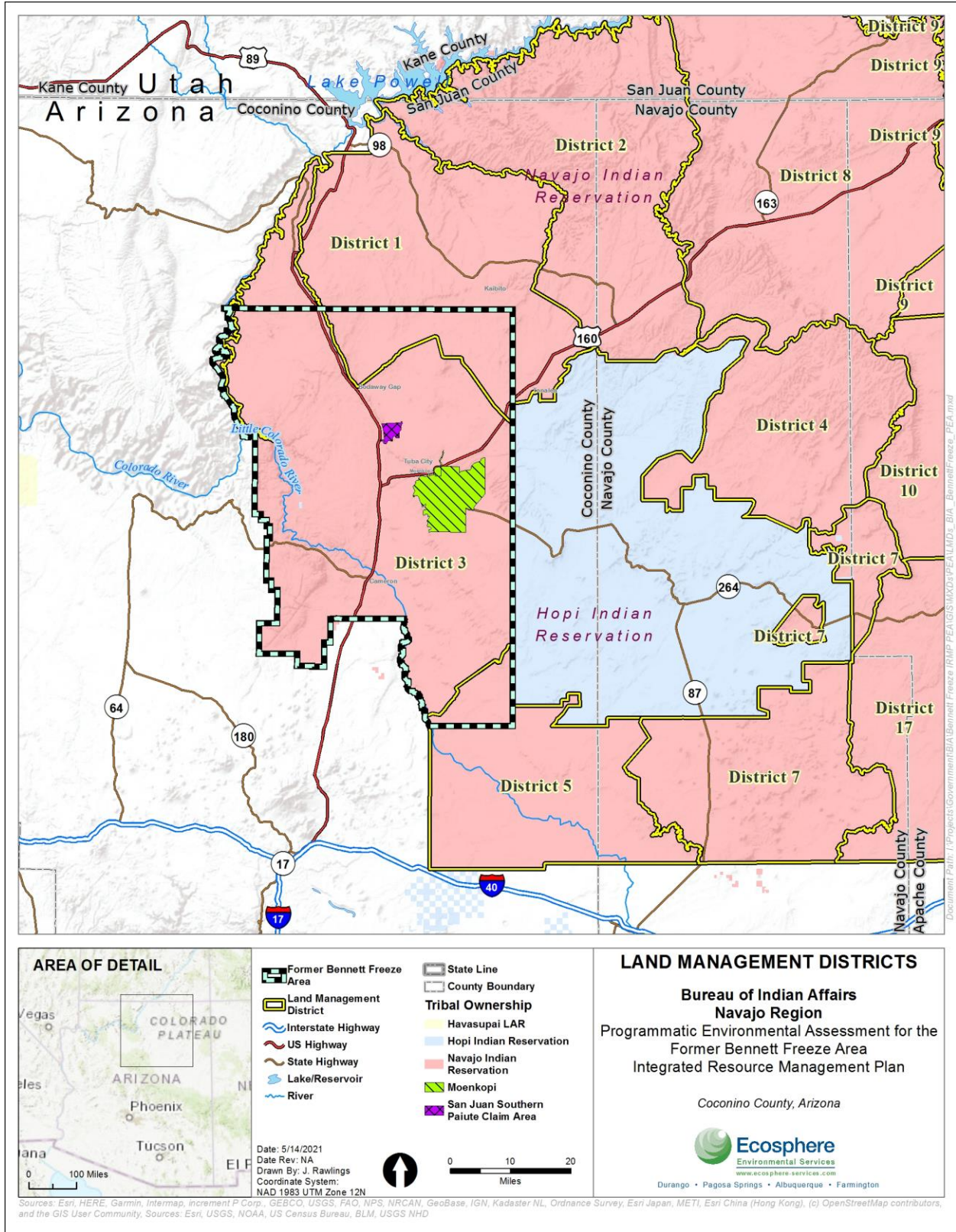
Map A-6. Proposed Land Management Areas in the Former Bennett Freeze Area SW Quarter



Map A-7. Fragile Soils in the Former Bennett Freeze Area



Map A-8. Water Resources in the Former Bennett Freeze Area



Map A-9. Grazing Land Management Districts in the Former Bennett Freeze Area

Appendix B – Economic Impact and Socioeconomic Analysis of the Former Bennett Freeze Area

Appendix C – Response to Public Comments

Appendix D – List of Projects Eligible for Categorical Exclusion

Categorical exclusion (CE) means a category of actions that do not have a significant effect on the human environment, and which have been found to have no such effect and for which; therefore, neither an environmental assessment nor an environmental impact statement is required (CEQ 2020). Many of the management activities that may occur in the Former Bennett Freeze Area (FBFA) are eligible as CEs, according to the Bureau of Indian Affairs (BIA).

According to the BIA National Environmental Policy Act (NEPA) guidance manual, “Most federal actions do not result in significant environmental impacts. The CEs are categories of actions that federal agencies have determined do not have a significant effect on the quality of the human environment and neither an Environmental Assessment (EA) nor an Environmental Impact Statement (EIS) is required.” (BIA 2012). According to this BIA NEPA guidance, “The majority of federal actions reviewed by the BIA fall under CEs.”

The BIA compiled their list of activities that would be eligible for CEs in coordination with the Council on Environmental Quality (CEQ) and published them in the Federal Register for public review. The United States Department of the Interior Manual for BIA Part 516 DM10 includes the final lists of actions designated as CEs (CEQ 2020). Some of the activities that are included in the Integrated Resource Management Plan that are eligible as CEs according to the BIA are listed in Table C-1.

Appendix Table D-1. Categorical Exclusions Relevant to the Former Bennett Freeze Area Integrated Natural Resource Management Plan

Agency/Type of Action	Categorical Exclusions
Operation, maintenance, and replacement of existing facilities	<ul style="list-style-type: none"> ▪ Operation, maintenance, and replacement of existing facilities that involve normal renovation of buildings, road maintenance, and rehabilitation of irrigation structures. ▪ Transfer of existing operation and maintenance activities of federal facilities to tribal groups, water user organizations, or other entities where the anticipated operation and maintenance activities are agreed upon in a contract, follow BIA policy, and no change in operations or maintenance is anticipated.
Self-Determination and Self-Governance	<ul style="list-style-type: none"> ▪ Self-Determination Act contracts and grants for BIA programs listed as categorical exclusions, or for programs in which environmental impacts are adequately addressed in earlier NEPA analysis. ▪ Self-Governance compacts for BIA programs listed as categorical exclusions or for programs in which environmental impacts are adequately addressed in earlier NEPA analysis.
Rights-of-way (ROW)	<ul style="list-style-type: none"> ▪ A ROW inside another ROW or amendments to a ROW where no deviations from or additions to the original ROW are involved and where there is an existing NEPA analysis covering the same or similar impacts in the ROW area. ▪ Service line agreements to an individual residence, building, or well from an existing facility where installation will involve no clearance of vegetation from the ROW other than for placement of poles, signs (including highway signs), or buried power/cable lines. ▪ Renewals, assignments, and conversions of existing ROW where there would be essentially no change in use and continuation would not lead to environmental degradation.
Roads and Transportation	<ul style="list-style-type: none"> ▪ Approval of utility installations along or across a transportation facility located in whole within the limits of the roadway right-of-way. ▪ Construction of bicycle and pedestrian lanes and paths adjacent to existing highways and within the existing ROW. ▪ Activities included in a "highway safety plan" under 23 CFR 402. ▪ Installation of fencing, signs, pavement markings, small passenger shelters, traffic signals, and railroad warning devices where no substantial land acquisition or traffic disruption will occur. ▪ Emergency repairs under 23 U.S.C. 125. ▪ Acquisition of scenic easements. ▪ Alterations to facilities to make them accessible for the elderly or handicapped. ▪ Resurfacing a highway without adding to the existing width.

Agency/Type of Action	Categorical Exclusions
	<ul style="list-style-type: none"> ▪ Rehabilitation, reconstruction, or replacement of an existing bridge structure on essentially the same alignment or location (e.g., widening, adding shoulders or safety lanes, walkways, bikeways, or guardrails). ▪ Approvals for changes in access control within existing rights-of-way. ▪ Road construction within an existing right-of-way, which has already been acquired for a HUD housing project and for which earlier NEPA analysis has already been prepared.
Forestry	<ul style="list-style-type: none"> ▪ Approval of free-use cutting, without permit, to Indian owners for on-reservation personal use of forest products, not to exceed 2,500 feet board measure when cutting will not adversely affect associated resources such as riparian zones, areas of special significance, etc. ▪ Approval and issuance of cutting permits for forest products not to exceed \$5,000 in value. ▪ Approval and issuance of paid timber cutting permits or contracts for products valued at less than \$25,000 when in compliance with policies and guidelines established by a current management plan addressed in earlier NEPA analysis. ▪ Approval of Fire Management Planning Analysis detailing emergency fire suppression activities. ▪ Approval of emergency forest and range rehabilitation plans when limited to environmental stabilization on less than 10,000 acres and not including approval of salvage sales of damaged timber. ▪ Approval of forest stand improvement projects of less than 2,000 acres when in compliance with policies and guidelines established by a current management plan addressed in earlier NEPA analysis. ▪ Approval of prescribed burning plans of less than 2,000 acres when in compliance with policies and guidelines established by a current management plan addressed in earlier NEPA analysis. ▪ Approval of forestation projects with native species and associated protection and site preparation activities on less than 2000 acres when consistent with policies and guidelines established by a current management plan addressed in earlier NEPA analysis. ▪ Harvesting live trees not to exceed 70 acres, requiring no more than 0.5 mile of temporary road construction. Such activities: <ul style="list-style-type: none"> • Shall not include even aged regeneration harvests or vegetation type conversions. • May include incidental removal of trees for landings, skid trails, and road clearing. ▪ May include temporary roads, which are defined as roads authorized by contract, permit, lease, other written authorization, or emergency operation not intended to be part of the BIA or Tribal transportation systems and not necessary for long-term resource management. Temporary roads shall be designed to standards appropriate for the intended uses, considering safety, cost of transportation, and impacts on land and resources; and ▪ Shall require the treatment of temporary roads constructed or used to permit the reestablishment by artificial or natural means, of vegetative cover on the roadway and areas where the vegetative cover was disturbed by the

Agency/Type of Action	Categorical Exclusions
	<p>construction or use of the road, as necessary to minimize erosion from the disturbed area. Such treatment shall be designed to reestablish vegetative cover as soon as practicable, but at least within 10 years after the termination of the contract. Examples include, but are not limited to:</p> <ul style="list-style-type: none"> • Removing individual trees for sawlogs, specialty products, or fuelwood. • Commercial thinning of overstocked stands to achieve the desired stocking level to increase health and vigor. <p>▪ Salvaging dead or dying trees not to exceed 250 acres, requiring no more than 0.5 mile of temporary road construction. Such activities:</p> <ul style="list-style-type: none"> • May include incidental removal of live or dead trees for landings, skid trails, and road clearing. • May include temporary roads, which are defined as roads authorized by contract, permit, lease, other written authorization, or emergency operation not intended to be part of the BIA or Tribal transportation systems and not necessary for long-term resource management. Temporary roads shall be designed to standards appropriate for the intended uses, considering safety, cost of transportation, and impacts on land and resources; and • Shall require the treatment of temporary roads constructed or used to permit the reestablishment, by artificial or natural means, of vegetative cover on the roadway and areas where the vegetative cover was disturbed by the construction or use of the road, as necessary to minimize erosion from the disturbed area. Such treatment shall be designed to reestablish vegetative cover as soon as practicable, but at least within 10 years after the termination of the contract. <p>▪ For this CE, a dying tree is defined as a standing tree that has been severely damaged by forces such as fire, wind, ice, insects, or disease, such that in the judgment of an experienced forest professional or someone technically trained for the work, the tree is likely to die within a few years. Examples include, but are not limited to:</p> <ul style="list-style-type: none"> • Commercial and non-commercial sanitation harvest of trees to control insects or disease not to exceed 250 acres, requiring no more than 0.5 miles of temporary road construction. Such activities: • May include removal of infested/infected trees and adjacent live uninfested/uninfected trees as determined necessary to control the spread of insects or disease; and • May include incidental removal of live or dead trees for landings, skid trails, and road clearing. <p>▪ May include temporary roads, which are defined as roads authorized by contract, permit, lease, other written authorization, or emergency operation not intended to be part of the BIA or tribal transportation systems and not necessary for long-term resource management. Temporary roads shall be designed to standards appropriate for the intended uses, considering safety, cost of transportation, and impacts on land and resources; and</p>

Agency/Type of Action	Categorical Exclusions
	<ul style="list-style-type: none"> ▪ Shall require the treatment of temporary roads constructed or used to permit the reestablishment, by artificial or natural means, of vegetative cover on the roadway and areas where the vegetative cover was disturbed by the construction or use of the road, as necessary to minimize erosion from the disturbed area. Such treatment shall be designed to reestablish vegetative cover as soon as practicable, but at least within 10 years after the termination of the contract. Examples include, but are not limited to: <ul style="list-style-type: none"> • Land Conveyance and Other Transfers. Approvals or grants of conveyances and other transfers of interests in land where no change in land use is planned. ▪ Reservation Proclamations. Lands established as or added to a reservation pursuant to 25 U.S.C. 467, where no change in land use is planned.
Waste Management	<ul style="list-style-type: none"> ▪ Closure operations for solid waste facilities when done in compliance with other federal laws and regulations and where cover material is taken from locations that have been approved for use by earlier NEPA analysis. ▪ Activities involving remediation of hazardous waste sites if done in compliance with applicable federal laws such as the Resource Conservation and Recovery Act (P.L. 94-580), Comprehensive Environmental Response, Compensation, and Liability Act (P.L. 96-516) or Toxic Substances Control Act (P.L. 94-469).
Other	<ul style="list-style-type: none"> ▪ Data gathering activities such as inventories, soil and range surveys, timber cruising, geological, geophysical, archeological, paleontological, and cadastral surveys. ▪ Establishment of non-disturbance environmental quality monitoring programs and field monitoring stations including testing services. ▪ Actions where BIA has concurrence or co-approval with another Bureau and the action is categorically excluded for that Bureau. ▪ Approval of an Application for Permit to Drill for a new water source or observation well. ▪ Approval of leases, easements, or funds for single-family homesites and associated improvements, including but not limited to, construction of homes, outbuildings, access roads, and utility lines, which encompass five acres or less of contiguous land, provided that such sites and associated improvements do not adversely affect any tribal cultural resources or historic properties and are in compliance with applicable federal and tribal laws.

Reference: Council on Environmental Quality. 2020. Update to the Regulations Implementing the Procedural Provisions of the National Environmental Policy Act. Federal Register. Vol 85, No. 137. July 16, 2020.

Appendix E - Land Use Development Analysis Process

Appendix Table E-1. Land Use Development Analysis Process

Constraint /Feature	Details of Constraint/ Feature	Buffer (mi)	Data Source	Resource Area	Description of Resource Area
Hydrology Resource Protection	tanks, windmills, wells	0.5	Data collected from an Ecosphere/WHPacific project. 2017-2018	Conservation Area	These areas were derived to protect resources such as threatened or endangered species, cultural resources and traditional cultural properties (TCPs), and Navajo-Hopi Intergovernmental compact areas, as well as protect water quality in streams and other water sources
Hydrology Resource Protection	wells	0.5	Navajo Nation water wells data	Conservation Area	These areas were derived to protect resources such as threatened or endangered species, cultural resources and traditional cultural properties (TCPs), and Navajo-Hopi Intergovernmental compact areas, as well as protect water quality in streams and other water sources
Hydrology Resource Protection	seeps, springs	0.5	Data collected from an Ecosphere/WHPacific project. 2017-2018 Excluding from analysis the ones marked "non-existent"	Conservation Area	These areas were derived to protect resources such as threatened or endangered species, cultural resources and TCPs, and Navajo-Hopi Intergovernmental compact areas, as well as protect water quality in streams and other water sources
Hydrology Resource Protection	wetlands	0.25	NWI data downloaded 7/7/2020. Data source vintage 12/6/2019. Excluded "Riverine" features from analysis.	Conservation Area	These areas were derived to protect resources such as threatened or endangered species, cultural resources and TCPs, and Navajo-Hopi Intergovernmental compact areas, as well as protect water quality in streams and other water sources

Constraint /Feature	Details of Constraint/ Feature	Buffer (mi)	Data Source	Resource Area	Description of Resource Area
Hydrology Resource Protection	National Hydrography Dataset	0.25	National Hydrography Dataset downloaded 7/7/2020 from United States Geological Survey.	Conservation Area	These areas were derived to protect resources such as threatened or endangered species and to protect water quality in streams and other water sources.
Biological Preserve	Navajo Nation Resource Conservation Areas		Downloaded 9/1/2019 from https://www.nndfw.org/clup.htm	Conservation Area	These areas were derived to protect resources such as threatened or endangered species, cultural resources and traditional cultural properties (TCPs), and Navajo-Hopi Intergovernmental compact areas, as well as protect water quality in streams and other water sources
Highway	Hwys 89, 160, 64, 264	0.25	Transportation dataset provided by Navajo Land Department	Development Focus Area	These areas include corridors along primary and secondary highways and roads where development is proposed or expected to occur and include communities such as Cameron and Tuba City that are expected to expand.
Road	BIA 6110, 20, 21	0.25	Transportation dataset provided by Navajo Land Department	Development Focus Area	These areas include corridors along primary and secondary highways and roads where development is proposed or expected to occur and include communities such as Cameron and Tuba City that are expected to expand.
Population Center	Tuba City: 5 Cameron, Bodaway Gap: 2 Tonalea: 3	Variable	Census data (see change log)	Development Focus Area	These areas include corridors along primary and secondary highways and roads where development is proposed or expected to occur and include communities such as Cameron and Tuba City that are expected to expand.

Constraint /Feature	Details of Constraint/ Feature	Buffer (mi)	Data Source	Resource Area	Description of Resource Area
Abandoned Uranium Mines		0.25	United States Environmental Protection Agency provided 5/16/19.	Restricted Development Area	These areas include abandoned uranium mines or other safety hazards where development or agriculture is discouraged.
Land Use Restriction	Floodplain	0	Navajo Nation Floodplain data provided by Navajo Nation Land Department.	Restricted Development Area	These areas include abandoned uranium mines or other safety hazards where development or agriculture is discouraged.