§ 180.672 Cyantraniliprole; tolerances for residues.

(d) * * *

TABLE 2 TO PARAGRAPH (d)

Commodity	Parts per million
* * * *	*
Sugarcane, cane	0.01

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DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

[Docket No. FWS–R8–ES–2022–0024; FF09E21000 FXES1111090FEDR 223]

RIN 1018–BG21

Endangered and Threatened Wildlife and Plants; Emergency Listing of the Dixie Valley Toad as Endangered

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Temporary rule; emergency action.

SUMMARY: We, the U.S. Fish and Wildlife Service (Service), exercise our authority pursuant to the Endangered Species Act of 1973, as amended (Act), to emergency list the Dixie Valley toad (*Anaxyrus williamsi*) as endangered. Due to the imminent development of a geothermal project in Dixie Meadows, Nevada, and the potential resulting effects to the geothermal springs relied upon by the Dixie Valley toad, there is a significant risk to the well-being of the species. We find that emergency listing is necessary in order to provide the protective measures afforded by the Act to the Dixie Valley toad. This emergency action (emergency rule) provides Federal protection pursuant to the Act for a period of 240 days. A proposed rule to list the Dixie Valley toad as endangered is published concurrently with this emergency rule in the Proposed Rules section of this issue of the **Federal Register**.

DATES: This temporary rule is effective April 7, 2022, through December 2, 2022.

ADDRESSES: This temporary rule, the species status assessment report and other materials related to this temporary rule, and the proposed rule are available on the internet at *https://www.regulations.gov* under Docket No. FWS–R8–ES–2022–0024.

FOR FURTHER INFORMATION CONTACT: Marc Jackson, Field Supervisor, U.S. Fish and Wildlife Service, Reno Fish and Wildlife Office, 1340 Financial Blvd., Suite 234, Reno, Nevada 89502; telephone 775–861–6300. Individuals in the United States who are deaf, deafblind, hard of hearing, or have a speech disability may dial 711 (TTY, TDD, or TeleBraille) to access telecommunications relay services. Individuals outside the United States should use the relay services offered within their country to make international calls to the point-of-contact in the United States.

SUPPLEMENTARY INFORMATION:

Previous Federal Actions

We received a petition from the Center for Biological Diversity (CBD) on September 18, 2017, requesting that the Dixie Valley toad be listed as a threatened or endangered species and that the petition be considered on an emergency basis (CBD 2017, entire). The Endangered Species Act of 1973, as amended (Act; 16 U.S.C. 1531 *et seq.*), does not provide a process to petition for emergency listing; therefore, we evaluated the petition to determine if it presented substantial scientific or commercial information indicating that the petitioned action may be warranted. We published a 90-day finding in the **Federal Register** on June 27, 2018 (83 FR 30091), stating that the petition presented substantial scientific or commercial information indicating that listing the Dixie Valley toad may be warranted.

Supporting Documents

A species status assessment (SSA) team prepared an SSA report for the Dixie Valley toad. The SSA team was composed of Service biologists, in consultation with other scientific experts. The SSA report represents a compilation of the best scientific and commercial data available concerning the status of the species, including the impacts of past, present, and future factors (both negative and beneficial) affecting the species and its habitat. In accordance with our joint policy on peer review published in the **Federal Register** on July 1, 1994 (59 FR 34270), and our August 22, 2016, memorandum updating and clarifying the role of peer review of listing actions under the Act, we will seek expert opinions of at least three appropriate specialists regarding the SSA concurrent with the open comment period identified in the proposed rule that is published concurrently with this emergency action (emergency rule) and found in the Proposed Rules section of this issue of the **Federal Register**. The SSA report and other materials related to this emergency rule, including the proposed rule, can be found at *https://www.regulations.gov* under Docket No. FWS–R8–ES–2022–0024. We note that, because we were already conducting a status review of the species, we had completed an SSA prior to publishing this emergency listing rule. Therefore, we have incorporated the information from the SSA here. However, given the purpose of emergency listing rules, they do not require this level of detail and analysis.

Background

A thorough review of the taxonomy, life history, and ecology of the Dixie Valley toad (*Anaxyrus williamsi*) is presented in the SSA report (Service 2022, entire).

The Dixie Valley toad was described as a distinct species in the western toads (*Anaxyrus boreas*) species complex in 2017 due to morphological differences, genetic information, and its isolated distribution (Gordon et al. 2017, entire). Forrest et al. (2017, entire) also published a paper describing Dixie Valley toad and came up with similar results but stopped short of concluding it is a unique species. We evaluated both papers and concluded that the Gordon et al. (2017, entire) paper provided a better sampling design to answer species-level genetic questions and included a more thorough morphological analysis. Additionally, the Dixie Valley toad has been accepted as a valid species by the two leading authoritative amphibian internet sites: (1) Amphibiaweb.org (AmphibiaWeb 2022, website) and (2) Amphibian Species of the World (Frost 2021, website). Because both the larger scientific community and our own analysis of the best available scientific information indicate that the findings of Gordon et al. (2017 entire) are well supported, we are accepting their conclusions that the Dixie Valley toad is a unique species (*Anaxyrus williamsi*). Therefore, we have determined that the Dixie Valley toad is a listable entity under the Act.

Fourteen different morphological characteristics of Dixie Valley toads were measured and compared to several other species within the western toads species complex (Gordon et al. 2017, pp. 125–131). While all 14 morphological characteristics measured for Dixie Valley toad were significantly different from the other species within the western toads species complex, the most striking differences were the average size of adults (the mean snout-to-vent length (SVL) is 54.6 millimeters (mm)

(2.2 inches (in)), which makes the Dixie Valley toad the smallest species within the *A. boreas* species complex), the close-set eyes and perceptively large tympanum (eardrum), and its unique coloration (Gordon et al. 2017, pp. 125–131).

Limited information is available specific to the life history of the Dixie Valley toad; therefore, closely associated species are used as surrogates where appropriate. Breeding (denoted by observing a male and female in amplexus, egg masses, or tadpoles) occurs annually between March and May (Forrest 2013, p. 76). Breeding appears protracted due to the thermal nature of the habitat and can last up to 3 months (March–May) with toads breeding early in the year in habitats closer to the thermal spring sources and then moving downstream into habitats as they warm throughout spring and early summer. Other toad species typically have a much more contracted breeding season of 3–4 weeks (*e.g.,* Sherman 1980, pp. 18–19, 72–73). Dixie Valley toad tadpoles hatch shortly after being deposited; time to hatching is not known but is likely dependent on water temperature (*e.g.,* black toad (*Anaxyrus exsul*) tadpoles hatch in 7 to 9 days; Sherman 1980, p. 97). Fully metamorphosed Dixie Valley toadlets were observed 70 days after egg laying (Forrest 2013, pp. 76–77).

The Dixie Valley toad is a narrow-ranging endemic (highly local and known to exist only in their place of origin) known from one population in the Dixie Meadows area of Churchill County, Nevada. The species occurs primarily on Department of Defense (DoD; Fallon Naval Air Station) lands (90 percent) and Bureau of Land Management (BLM) lands (10 percent). The wetlands located in Dixie Meadows cover 307.6 hectares (ha) (760 acres (ac)) and are fed by geothermal springs. The potential area of occupancy is estimated to be 146 ha (360 ac) based on the extent of wetland-associated vegetation. The species is heavily reliant on these wetlands, as it is rarely encountered more than 14 meters (m) (46 feet (ft)) from aquatic habitat (Halstead et al. 2021, p. 7).

Regulatory and Analytical Framework

Regulatory Framework

Section 4 of the Act (16 U.S.C. 1533) and its implementing regulations (50 CFR part 424) set forth the procedures for determining whether a species is an endangered species or a threatened species. The Act defines an ''endangered species'' as a species that is in danger of extinction throughout all or a significant portion of its range, and a ''threatened species'' as a species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. The Act requires that we determine whether any species is an endangered species or a threatened species because of any of the following factors:

(A) The present or threatened destruction, modification, or curtailment of its habitat or range;

(B) Overutilization for commercial, recreational, scientific, or educational purposes;

(C) Disease or predation;

(D) The inadequacy of existing regulatory mechanisms; or

(E) Other natural or manmade factors affecting its continued existence.

These factors represent broad categories of natural or human-caused actions or conditions that could have an effect on a species' continued existence. In evaluating these actions and conditions, we look for those that may have a negative effect on individuals of the species, as well as other actions or conditions that may ameliorate any negative effects or may have positive effects.

We use the term ''threat'' to refer in general to actions or conditions that are known to or are reasonably likely to negatively affect individuals of a species. The term ''threat'' includes actions or conditions that have a direct impact on individuals (direct impacts), as well as those that affect individuals through alteration of their habitat or required resources (stressors). The term ''threat'' may encompass—either together or separately—the source of the action or condition or the action or condition itself.

However, the mere identification of any threat(s) does not necessarily mean that the species meets the statutory definition of an ''endangered species'' or a ''threatened species.'' In determining whether a species meets either definition, we must evaluate all identified threats by considering the species' expected response and the effects of the threats—in light of those actions and conditions that will ameliorate the threats—on an individual, population, and species level. We evaluate each threat and its expected effects on the species, then analyze the cumulative effect of all of the threats on the species as a whole. We also consider the cumulative effect of the threats in light of those actions and conditions that will have positive effects on the species, such as any existing regulatory mechanisms or conservation efforts. The Secretary determines whether the species meets the definition of an ''endangered species'' or a ''threatened species'' only after conducting this cumulative analysis and describing the expected effect on the species now and in the foreseeable future.

The Act does not define the term ''foreseeable future,'' which appears in the statutory definition of ''threatened species.'' Our implementing regulations at 50 CFR 424.11(d) set forth a framework for evaluating the foreseeable future on a case-by-case basis. The term ''foreseeable future'' extends only so far into the future as we can reasonably determine that both the future threats and the species' responses to those threats are likely. In other words, the foreseeable future is the period of time in which we can make reliable predictions. ''Reliable'' does not mean ''certain''; it means sufficient to provide a reasonable degree of confidence in the prediction. Thus, a prediction is reliable if it is reasonable to depend on it when making decisions.

It is not always possible or necessary to define foreseeable future as a particular number of years. Analysis of the foreseeable future uses the best scientific and commercial data available and should consider the timeframes applicable to the relevant threats and to the species' likely responses to those threats in view of its life-history characteristics. Data that are typically relevant to assessing the species' biological response include species-specific factors such as lifespan, reproductive rates or productivity, certain behaviors, and other demographic factors.

Analytical Framework

The SSA report documents the results of our comprehensive biological review of the best scientific and commercial data regarding the status of the species, including an assessment of the potential threats to the species (Service 2022, entire). The SSA report does not represent our decision on whether the species should be listed as an endangered or threatened species under the Act. However, it does provide the scientific basis that informs our regulatory decisions, which involve the further application of standards within the Act and its implementing regulations and policies. The following is a summary of the key results and conclusions from the SSA report; the full SSA report can be found at Docket No. FWS–R8–ES–2022–0024 on *https://www.regulations.gov.*

To assess Dixie Valley toad viability, we used the three conservation biology principles of resiliency, redundancy, and representation (Shaffer and Stein 2000, pp. 306–310). Briefly, resiliency supports the ability of the species to withstand environmental and demographic stochasticity (for example, wet or dry, warm or cold years), redundancy supports the ability of the species to withstand catastrophic events (for example, droughts, large pollution events), and representation supports the ability of the species to adapt over time to long-term changes in the environment (for example, climate changes). In general, the more resilient and redundant a species is and the more representation it has, the more likely it is to sustain populations over time, even under changing environmental conditions. Using these principles, we identified the species' ecological requirements for survival and reproduction at the individual, population, and species levels, and described the beneficial and risk factors influencing the species' viability.

The SSA process can be categorized into three sequential stages. During the first stage, we evaluated the individual species' life-history needs. The next stage involved an assessment of the historical and current condition of the species' demographics and habitat characteristics, including an explanation of how the species arrived at its current condition. The final stage of the SSA involved making predictions about the species' responses to positive and negative environmental and anthropogenic influences. Throughout all of these stages, we used the best available information to characterize viability as the ability of a species to sustain populations in the wild over time. We used this information to inform our regulatory decision.

We note that, by using the SSA framework to guide our analysis of the scientific information documented in the SSA report, we have not only analyzed individual effects on the species, but we have also analyzed their potential cumulative effects. We incorporate the cumulative effects into our SSA analysis when we characterize the current and future condition of the species. To assess the current and future condition of the species, we undertake an iterative analysis that encompasses and incorporates the threats individually and then accumulates and evaluates the effects of all the factors that may be influencing the species, including threats and conservation efforts. Because the SSA framework considers not just the presence of the factors, but to what degree they collectively influence risk to the entire species, our assessment integrates the cumulative effects of the factors and replaces a standalone cumulative effects analysis.

Summary of Biological Status and Threats

In this discussion, we review the biological condition of the species and its resources, and the threats that influence the species' current and future condition, in order to assess the species' overall viability and the risks to that viability.

Species Needs

Wetted Area

Dixie Meadows contains 122 known spring and seep sources and discharges approximately 1,109,396 cubic meters per year (m^3/yr) (900 acre-feet per year (afy)) (McGinley and Associates 2021, pp. 1–2), which distributes across the wetland complex water that then flows out to the playa or is collected in a large ephemeral pond in the northeast portion of the wetland complex. Some of the larger springs have springbrooks that form channels while in other areas the water spreads out over the ground or through wetland vegetation creating a thin layer of water or wet soil that helps maintain the wetland. Spring discharge is inherently linked to the amount of wetted area within the wetland complex. Spring discharge is important for the viability of the Dixie Valley toad because changes to discharge rates likely impact the ability of the toad to survive in a particular spring complex.

Dixie Valley toad is a highly aquatic species rarely found more than 14 m (46 ft) away from water (Halstead et al. 2021, pp. 28, 30). The species needs wetted area for shelter, feeding, reproduction, and dispersal. Any change in the amount of wetted area will directly influence the amount of habitat available to the Dixie Valley toad. Due to the already restricted range of the habitat, the species needs to maintain the entirety of the 1.46-square-kilometer (km^2) (360-ac) potential area of occupancy, based on the extent of the wetland-associated vegetation.

Adequate Water Temperature

In addition to the Dixie Valley toad being highly aquatic, the temperature of the water is also important to its life history. The species needs warm temperatures for shelter and reproduction. The Dixie Valley toad selects water or substrate that is warmer compared to nearby random paired locations, particularly in spring, fall, and winter months (Halstead et al. 2021, pp. 30, 33–34). During spring, they select areas with warmer water for breeding (oviposition sites), which allows for faster egg hatching and time to metamorphosis (Halstead et al. 2021, pp. 30, 33–34). During fall, they select warmer areas (closer to thermal springs with dense vegetation), which satisfies their thermal preferences as nighttime temperatures decrease (Halstead et al. 2021, pp. 30, 33–34). As winter approaches, toads find areas with consistent warm temperatures during brumation (hibernation for cold-blooded animals), so they do not freeze (Halstead et al. 2021, pp. 30, 33–34). This affinity for warm water temperature during brumation is unique to the Dixie Valley toad as compared to other species within the western toad species complex, which select burrows, rocks, logs, or other structures to survive through winter (Browne and Paszkowski 2010, pp. 53–56; Halstead et al. 2021, p. 34). Therefore, although the exact temperatures are unknown (range between 10–41 degrees Celsius (°C) (50–106 degrees Fahrenheit (°F)), Dixie Valley toad requires water temperatures warm enough to successfully breed and survive colder months during the year.

Wetland Vegetation

The most common wetland vegetation found within Dixie Meadows includes *Juncus balticus* (Baltic rush), *Schoenoplectus* spp. (bulrushes), *Phragmites australis* (common reed), *Eleocharis* spp. (spikerushes), *Typha* spp. (cattails), *Carex* spp. (sedges), and *Distichilis spicata* (saltgrass) (AMEC Environment and Infrastructure 2014, p. I–1; Tierra Data 2015, pp. 2–25—2–29; McGinley and Associates 2021, pp. 50–52, 93–99). Several species of invasive and nonnative plants also occur in Dixie Meadows including *Cicuta maculate* (water hemlock), *Cardaria draba* (hoary cress), *Lepidium latifolium* (perennial pepperweed), *Eleagnus angustifolius* (Russian olive), and *Tamarix ramosissima* (saltcedar) (AMEC Environment and Infrastructure 2014, p. 3–59). The Dixie Valley toad needs sufficient wetland vegetation to use as shelter. At a minimum, maintaining the current heterogeneity of the wetland vegetation found in Dixie Meadows is a necessary component for maintaining the resiliency of the Dixie Valley toad (Halstead et al. 2021, p. 34).

Adequate Water Quality

Amphibian species spend all or part of their life cycle in water; therefore, water quality characteristics directly affect amphibians. Dissolved oxygen, potential hydrogen (pH), salinity, water conductivity, and excessive nutrient concentrations (among other water quality metrics) all have direct and indirect impacts to the survival, growth, maturation, and physical development of amphibian species when found to be outside of naturally occurring levels for any particular location (Sparling 2010, pp. 105–117).

Various water quality data have been collected from a few springs within Dixie Meadows and from wells drilled during geothermal exploration activities (McGinley and Associates 2021, pp. 57–64). The exact water quality parameters preferred by the Dixie Valley toad are unknown; however, this species has evolved only in Dixie Meadows and is presumed to thrive in the current existing, complex mix of water emanating from both the basin-fill aquifer and the deep geothermal reservoir. Within the unique habitat in Dixie Meadows, and given the life history and physiological strategies employed by the species, a good baseline of existing environmental water quality factors that are most important for all life stages should be studied (Rowe et al. 2003, p. 957). The Dixie Valley toad needs the natural variation of the current water quality parameters found in Dixie Meadows to maintain resiliency.

Threats Analysis

We reviewed the potential risk factors (*i.e.,* threats, stressors) that may be currently affecting the Dixie Valley toad. In this rule, we discuss only those factors in detail that could meaningfully affect the status of the species.

The primary threats affecting the status of the Dixie Valley toad are geothermal development and associated groundwater pumping (Factor A); establishment of *Batrachochytrium dendrobatidis* (*Bd;* hereafter referred to as amphibian chytrid fungus), which causes the disease chytridiomycosis (Factor C); predation by the invasive American bullfrog (*Lithobates catesbeianus*) (Factor C); groundwater pumping associated with human consumption, agriculture, and county planning (Factor A); and climate change (Factor A). Climate change may further influence the degree to which these threats, individually or collectively, may affect the Dixie Valley toad. The risk factors that are unlikely to have significant effects on the Dixie Valley toad, such as livestock grazing and historical spring modifications, are not discussed here but are evaluated in the current condition assessment of the SSA report.

Geothermal Development

Geothermal resources are reservoirs of hot water or steam found at different temperatures and depths below the ground. These geothermal reservoirs can be used to produce energy by drilling a well and bringing the heated water or steam to the surface. Geothermal energy plants use the steam or heat created by the hot water to drive turbines that produce electricity. Three main technologies are being used today to convert geothermal water into electricity: Dry steam, flash steam, and binary cycle. Binary technology is the focus for this analysis, because that type of geothermal power technology has been approved for development at Dixie Meadows.

Binary cycle power plants use the heat from the geothermal reservoir to heat a secondary fluid (*e.g.,* butane) that generally has a much lower boiling point than water. This process is accomplished through a heat exchanger, and the secondary fluid is flashed into vapor by the heat from the geothermal fluid; the vapor drives the turbines to generate electricity. The geothermal fluid is then reinjected back into the ground to maintain pressure and be reheated.

General impacts from geothermal production facilities are presented below. Because every geothermal field is unique, it is difficult to predict what effects from geothermal production may occur.

Prior to geothermal development, the flow path of water underneath the land surface is usually not known with sufficient detail to understand and prevent impacts to the surface wetlands dependent upon those flows (Sorey 2000, p. 705). Changes associated with surface expression of thermal waters from geothermal production are common and are expected. Typical changes seen in geothermal fields include, but are not limited to, changes in water temperature, flow, and water quality, which are all resource needs of the Dixie Valley toad that could be negatively affected by geothermal production (Sorey 2000, entire; Bonte et al. 2011, pp. 4–8; Kaya et al. 2011, pp. 55–64; Chen et al. 2020, pp. 2–6).

Steam discharge, land subsidence (*i.e.,* gradual settling or sudden sinking of the ground surface due to the withdrawal of large amounts of groundwater), and changes in water temperature and flow have all been documented from geothermal production areas throughout the western United States (Sorey 2000, entire). For example:

(1) Long Valley Caldera near Mammoth, California. Geothermal pumping in the period 1985–1998 resulted in several springs ceasing to flow and declines in pressure of the geothermal reservoir, which has caused reductions of 10–15 °C (50–59 °F) in the reservoir temperature and a localized decrease of approximately 80 °C (176 °F) near the reinjection zone (Sorey 2000, p. 706).

(2) Steamboat Springs near Reno, Nevada. Geothermal development resulted in the loss of surface discharge (geysers and springs) on the main terrace and a reduction of thermal water discharge to Steamboat Creek by 40 percent (Sorey 2000, p. 707).

(3) Northern Dixie Valley near Reno, Nevada. Other common changes that accompany the loss of surficial water sources, such as geysers and thermal springs, from geothermal production include an increase in steam discharge and land subsidence (Sorey 2000, p. 705). Both steam discharge and land subsidence were detected at an existing 56-megawatt (MW) geothermal plant in northern Dixie Valley, Nevada, which has been in production since 1985 (Sorey 2000, p. 708; Huntington et al. 2014, p. 5). The northern Dixie Valley geothermal plant began pumping water from the cold basin fill aquifer (local aquifer) and reinjecting it above the hot geothermal reservoir (regional aquifer) to try and alleviate land subsidence issues (Huntington et al. 2014, p. 5). This approach may have led to an increase in depth to groundwater from 1.8 m (6 ft) in 1985 to 4.3–4.6 m (14–15 ft) in 2009–2011 (Albano et al. 2021, p. 78).

(4) Jersey Valley near Reno, Nevada. In 2011, a 23.5–MW geothermal power plant started production in Jersey Valley, just north of Dixie Valley. Measured springflow of 0.08–0.17 cubic feet per second (cfs) (35–75 gallons per minute (gpm)) at a perennial thermal spring began to decline almost immediately after the power plant began operation (BLM 2022, p. 1; Nevada Department of Water Resources (NDWR) 2022, unpublished data). By 2014, the Jersey Valley Hot Spring ceased flowing (BLM 2022, p. 1; NDWR 2022, unpublished data). The loss of aquatic insects from the springbrook has diminished the foraging ability of eight different bat species that occur in the area (BLM 2022, p. 28). To mitigate for the spring going dry, the BLM proposed to pipe geothermal fluid 1.1 km (3,600 ft) to the spring source (BLM 2022, p. 8); however, mitigation has not yet occurred. If a similar outcome were to occur in Dixie Meadows, resulting in the complete drying of the springs, the Dixie Valley toad would likely be extirpated if mitigation to prevent the drying of the springs is not satisfactorily or timely achieved.

In an effort to minimize changes in water temperature, quantity, and quality, and to maintain pressure of the geothermal reservoir, geothermal fluids are reinjected into the ground, though reinjected water is at a lower temperature than when it was pumped out of the ground. This practice entails much trial and error in an attempt to equilibrate subsurface reservoir pressure. It can take several years to understand how a new geothermal field will react to production and reinjection wells; however, reinjection does not always have the desired effect (Kaya et al. 2011, pp. 55–64).

Geothermal energy production has been cited as the greatest threat to the persistence of Dixie Valley toad (Forrest et al. 2017, pp. 172–173; Gordon et al. 2017, p. 136; Halstead et al. 2021, p. 35). Geothermal environments often harbor unique flora and fauna that have evolved in these rare habitats (Boothroyd 2009, entire; Service 2019, entire). Changes to these rare habitats often cause declines in these endemic organisms or even result in the destruction of their habitat (Yurchenko 2005, p. 496; Bayer et al. 2013, pp. 455–456; Service 2019, pp. 2–3). Because the Dixie Valley toad relies heavily on wetted area and warm water temperature to remain viable, reduction of these two resource needs could cause significant declines in the population and changes to its habitat that are detrimental to the species and result in it being in danger of extinction.

Disease

Over roughly the last four decades, pathogens have been associated with amphibian population declines, mass die-offs, and extinctions worldwide (Bradford 1991, pp. 174–176; Muths et al. 2003, pp. 359–364; Weldon et al. 2004, pp. 2,101–2,104; Rachowicz et al. 2005, pp. 1,442–1,446; Fisher et al. 2009, pp. 292–302; Knapp et al. 2011, pp. 8–19). One pathogen strongly associated with dramatic declines on all continents that harbor amphibians is chytridiomycosis caused by amphibian chytrid fungus (Rachowicz et al. 2005, pp. 1,442–1,446). Chytrid fungus has now been reported in amphibian species worldwide (Fellers et al. 2001, pp. 947–952; Rachowicz et al. 2005, pp. 1,442–1,446). Early doubt that this particular pathogen was responsible for worldwide die-offs has largely been overcome by the weight of evidence documenting the appearance, spread, and detrimental effects to affected populations (Vredenburg et al. 2010, pp. 9,690–9,692).

Clinical signs of chytridiomycosis and diagnosis include abnormal posture, lethargy, and loss of righting reflex (the ability to correct the orientation of the body when it is not in its normal upright position) (Daszak et al. 1999, p. 737). Chytridiomycosis also causes gross lesions, which are usually not apparent and consist of abnormal epidermal sloughing and ulceration, as well as hemorrhages in the skin, muscle, or eye (Daszak et al. 1999, p. 737). Chytridiomycosis can be identified in some species of amphibians by examining the oral discs (tooth rows) of tadpoles that may be abnormally formed or lacking pigment (Fellers et al. 2001, pp. 946–947).

Despite the acknowledged impacts of chytridiomycosis to amphibians, little is known about this disease outside of mass die-off events. There is high variability between species of amphibians in response to being infected including within the western toads species complex. Two long-term study sites have documented differences in apparent survival of western toads between two different sites in Montana and Wyoming (Russell et al. 2019, pp. 300–301). The chytrid-positive western toad population in Montana was reduced by 19 percent compared to chytrid-negative toads in that area—in comparison to the western toad population in Wyoming, which was reduced by 55 percent (Russell et al. 2019, p. 301). Various diseases are confirmed to be lethal to Yosemite toads (Green and Sherman 2001, p. 94), and research has elucidated the potential role of chytrid fungus infection as a threat to Yosemite toad populations (Dodge 2013, pp. 6–10, 15–20; Lindauer and Voyles 2019, pp. 189–193). These various diseases and infections, in concert with other factors, have likely contributed to the decline of the Yosemite toad (Sherman and Morton 1993, pp. 189–197) and may continue to pose a risk to the species (Dodge 2013, pp. 10–11; Lindauer and Voyles 2019, pp. 189–193). Amargosa toads are known to have high infection rates and high chytrid fungus loads; however, they do not appear to show adverse impacts from the disease (Forrest et al. 2015, pp. 920–922). Not all individual amphibians that test positive for chytrid fungus develop chytridiomycosis.

Dixie Valley toad was sampled for chytrid fungus in 2011–2012 (before it was recognized as a species) and 2019–2021 (Forrest 2013, p. 77; Kleeman et al. 2021, entire); chytrid fungus was not found during either survey. However, chytrid fungus has been documented in bullfrogs in Dixie Valley (Forrest 2013, p. 77), which is a known vector species for spreading chytrid fungus and diseases to other species of amphibians (Daszak et al. 2004, pp. 203–206; Urbina et al. 2018, pp. 271–274; Yap et al. 2018, pp. 4–8).

The best available information indicates that the thermal nature of the Dixie Valley toad habitat may keep chytrid fungus from becoming established; therefore, it is imperative that the water maintains its natural thermal characteristics (Forrest 2013, pp. 75–85; Halstead et al. 2021, pp. 33–35). Boreal toads exposed to chytrid fungus survive longer when exposed to warmer environments (mean 18 °C (64 °F)) as compared to boreal toads in cooler environments (mean 15 °C (59 °F)) (Murphy et al. 2011, pp. 35–38). Additionally, chytrid fungus zoosporangia grown at 27.5 °C (81.5 °F) remain metabolically active; however, no zoospores are produced, indicating no reproduction at this high temperature (Lindauer et al. 2020, pp. 2–5). Generally, chytrid fungus does not seem to become established in water warmer than 30 °C (86 °F) (Forrest and Schlaepfer 2011, pp. 3–7). Dixie Meadows springhead water temperatures range from 13 °C (55 °F) to 74 °C (165 °F), though the four largest spring complexes (springs that create the largest wetland areas and are inhabited by a majority of the Dixie Valley toad population) range from 16 °C (61 °F) to 74 °C (165 °F) with median temperatures of at least 25 °C (77 °F). Additionally, water temperatures measured in 2019 at toad survey sites throughout Dixie Meadows (*i.e.,* not at springheads) ranged from 10 to 41 °C (50 to 106 °F). Any reduction in water temperature, including reductions caused by geothermal development, would not only affect the ability of Dixie Valley toads to survive during cold months, but could also make the species vulnerable to chytrid fungus.

Predation

Predation has been reported in species similar to the Dixie Valley toad and likely occurs in Dixie Meadows; however, predation of Dixie Valley toads has not been documented. Likely predators on the egg and aquatic larval forms of Dixie Valley toad include predacious diving beetles (*Dytiscus* sp.) and dragonfly larvae (Odonata). Common ravens (*Corvus corax*) and other corvids are known to feed on juvenile and adult black toads and Yosemite toads (Sherman 1980, pp. 90–92; Sherman and Morton 1993, pp. 194–195). Raven populations are increasing across the western United States and are clearly associated with anthropogenic developments, such as roads and power lines (Coates and Delehanty 2010, pp. 244–245; Howe et al. 2014, pp. 44–46). Ravens are known to nest within Dixie Valley (Environmental Management and Planning Solutions 2016, pp. 3–4).

The American bullfrog, a ranid species native to much of central and eastern North America, now occurs within Dixie Meadows (Casper and Hendricks 2005, pp. 540–541; Gordon et al. 2017, p. 136). Bullfrogs are recognized as one of the 100 worst invasive species in the world (Global Invasive Species Database 2021, pp. 1–17). Bullfrogs are known to compete with and prey on other amphibian species (Moyle 1973, pp. 19–21; Kiesecker et al. 2001, pp. 1,966–1,969; Pearl et al. 2004, pp. 16–18; Casper and Hendricks 2005, pp. 543–544; Monello et al. 2006, p. 406; Falaschi et al. 2020, pp. 216–218).

Bullfrogs are a gape-limited predator, which means they eat anything they can swallow (Casper and Hendricks 2005, pp. 543–544). Dixie Valley toad is the smallest toad species in the western toads species complex and can easily be preyed upon by bullfrogs. Smaller bullfrogs eat mostly invertebrates (Casper and Hendricks 2005, p. 544), and thus may compete with Dixie Valley toad for food resources. Within Dixie Valley, bullfrogs are known to occur at Turley Pond and in one area of Dixie Meadows adjacent to occupied Dixie Valley toad habitat (Forrest 2013, pp. 74, 87; Rose et al. 2015, p. 529; Halstead et al. 2021, p. 24).

Climate Change

Both human settlements and natural ecosystems in the Southwestern United States are largely dependent on groundwater resources, and decreased groundwater recharge may occur as a result of climate change (U.S. Global Change Research Program 2009, p. 133). Furthermore, the human population in the Southwest is expected to increase 70 percent by mid-century (Garfin 2014, p. 470). Resulting increases in urban development, agriculture, and energy-production facilities will likely place additional demands on already limited water resources. Climate change will likely increase water demand while at the same time shrink water supply, since water loss may increase evapotranspiration rates and runoff during storm events (Archer and Predick 2008, p. 25).

In order to identify changing climatic conditions more specific to Dixie Meadows, we conducted a climate analysis using the Climate Mapper web tool (Hegewisch et al. 2020, online). The Climate Mapper is a web tool for visualizing past and projected climate and hydrology of the contiguous United States. This tool maps real-time conditions, current forecasts, and future projections of climate information across the United States to assist with decisions related to agriculture, climate, fire conditions, and water.

For our analysis, we analyzed mean annual temperature and percent precipitation using the historical period of 1971–2000 and the projected future time period 2040–2069. We examined emission scenarios that used representative concentration pathways (RCPs) 4.5 and 8.5 using ArcGIS Pro.

Our analysis predicts increased air temperatures in Dixie Meadows, along with a slight increase in precipitation. Annual mean air temperature is projected to increase between 2.5 and 3.4 °C (4.5 and 6.1 °F) and result in average temperatures 3.0 °C (5.3 °F) warmer throughout Dixie Meadows between 2040 and 2069 (Hegewisch et al. 2020, Geographic Information System (GIS) data). Under two emission scenarios, annual precipitation is projected to increase by 4.5 to 7.7 percent (Hegewisch et al. 2020, GIS data).

Climate change may impact the Dixie Valley toad and its habitat in two main ways: (1) Reductions in springflow as a result of changes in the amount, type, and timing of precipitation, increased evapotranspiration rates, and reduced aquifer recharge; and (2) reductions in springflow as a result of changes in human behavior in response to climate change (*e.g.,* increased groundwater pumping as surface water resources disappear). A reduction in springflow could be exacerbated by the greater severity of droughts being experienced in the Southwestern United States, including Nevada (Snyder et al. 2019, pp. 2–4; Williams et al. 2020, pp. 1–5). Higher temperatures and drier conditions could result in greater evapotranspiration, leading to increased drying of wetland habitat. Impacts vary geographically, and identifying the vulnerability of individual springs is challenging. For example, a study examining different springs over a 14-year period at Arches National Park in Utah found that each spring responded to local precipitation and recharge differently, despite similarities to Dixie Valley in topographic setting, aquifer type, and climate exposure (Weissinger 2016, p. 9).

Predicting individual spring response to climate change is further complicated by the minimal information available about the large hydrological connections for most sites and the high degree of uncertainty inherent in future precipitation models. Regardless, the best available data indicate that Dixie Valley toad may be vulnerable to climate change to an unknown degree, but we cannot say with any certainty where impacts may be manifested or the greatest.

Groundwater Pumping

The basin is fully appropriated for consumptive groundwater uses (18,758,663 cubic meters per year (m^3/yr) (15,218 acre-feet per year (afy)) of an estimated 18,489,943 m^3/yr (15,000 afy) perennial yield), and the proposed Dixie Valley groundwater export project by Churchill County is seeking an additional 12,326,628–18,489,943 m^3/yr (10,000–15,000 afy) (Huntington et al. 2014, p. 2). Total geothermal water rights appropriated in Dixie Valley as of 2020 are 15,659,749 m^3/yr (12,704 afy) (BLM 2021b, pp. 2–28).

Increased groundwater pumping in Nevada is primarily driven by human water demand for municipal purposes, irrigation, and development for oil, gas, geothermal resources, and minerals. Many factors associated with groundwater pumping can affect whether or not an activity will impact a spring. These factors include the amount of groundwater to be pumped, period of pumping, the proximity of pumping to a spring, depth of pumping, and characteristics of the aquifer being impacted. Depending on these factors, groundwater withdrawal may result in no measurable impact to springs or may reduce spring discharge, change the temperature of the water, reduce free-flowing water, dry springs, alter Dixie Valley toad habitat size and heterogeneity, or create habitat that is more suited to nonnative species than to native species (Sada and Deacon 1994, p. 6). Pumping rates that exceed perennial yield can lower the water table, which in turn will likely affect riparian vegetation (Patten 2008, p. 399).

Determining when groundwater withdrawal exceeds perennial yield is difficult to ascertain and reverse due to inherent delays in detection of pumping impacts and the subsequent lag time required for recovery of discharge at a spring (Bredehoeft 2011, p. 808). Groundwater pumping initially captures stored groundwater near the pumping area until water levels decline and a cone of depression expands, potentially impacting water sources to springs or streams (Dudley and Larson 1976, p. 38). Spring aquifer source and other aquifer characteristics influence the ability and rate at which a spring fills and may recover from groundwater pumping (Heath 1983, pp. 6, 14). Depending on aquifer characteristics and rates of pumping, recovery of the aquifer is variable and may take several years or even centuries (Heath 1983, p. 32; Halford and Jackson 2020, p. 70). Yet where reliable records exist, most springs fed by even the most extensive aquifers are affected by exploitation, and springflow reductions relate directly to quantities of groundwater removed (Dudley and Larson 1976, p. 51).

The most extreme potential effects of groundwater withdrawal on Dixie Valley toad are likely desiccation and extirpation or extinction. If groundwater withdrawal occurs but does not cause a spring to dry, there can still be adverse effects to Dixie Valley toads or their habitat because reduction in springflow reduces both the amount of water and amount of occupied habitat. If the withdrawals also coincide with altered precipitation and temperature from climate change, even less water will be available. Cumulatively, these conditions could result in a delay in groundwater recharge at springs, which may then result in a greater effect to the Dixie Valley toad than the effects of the individual threats acting alone. Across the Dixie Meadows springs, discharge varies greatly, with some springs with low discharge at the current time likely due to a combination of influences, both natural and anthropogenic. Though there is much uncertainty around the magnitude and timing of groundwater withdrawal, and thus the possible effects on the Dixie Meadows spring system, we anticipate that the future effects of groundwater withdrawal could have significant effects on the Dixie Meadows spring system.

Current Condition

Redundancy, Representation, and Resiliency

Population estimates are not available for the Dixie Valley toad. Time-series data of toad abundance are available from various surveys conducted by the Service and the Nevada Department of Wildlife (NDOW) during the period 2009–2012 (before the Dixie Valley toad was recognized as a species); however, differences in sample methodology between years and low recapture rates indicate that consistent reproduction is occurring.

In 2018, Dixie Valley toads were detected in 38 of 60 randomized plots in the Dixie Meadows wetlands, with a 95 percent credible interval (Bayesian equivalent of a confidence interval) for probability of toad occurrence of 0.55–0.98 in plots of average water temperature (18.8 °C (65.8 °F)) (Halstead et al. 2019, p. 9). In other words, adult toads currently have high occupancy rates and are generally more likely than not to occur across the Dixie Meadows wetlands. The 95 percent credible interval for the probability of reproduction in an average plot (18.8 °C (65.8 °F) and 45 percent wetted area) was 0.01–0.26 and increased as a function of wetted surface area in plots with adults present (Halstead et al. 2019, p. 10). Although larvae have a lower probability of occurring within an average plot than adults, warmer water temperatures strongly influence the probability of reproduction (Halstead et al. 2019, pp. 10–11). This finding suggests that adult toads are seeking out a specific subset of habitat for reproduction based in part on water temperature. The percentage of the range currently occupied by adults remained similarly high throughout 2018–2021 and across seasons (Rose et al. 2022, entire).

The high occupancy rate observed from 2018 through 2021 and evidence of reproduction observed in the period 2009–2021 suggest that the Dixie Valley toad is currently maintaining resilience to the historical and current environmental stochasticity present at Dixie Meadows. However, the narrowly distributed, isolated nature of the single population of the species indicates that the Dixie Valley toad has little ability to withstand stochastic or catastrophic events through dispersal. Because the species evolved in a unique spring system with little historical variation, we conclude that it has low potential to adapt to a fast-changing environment. As a single-site endemic with no dispersal opportunities outside the current range, the species has inherently low redundancy and representation and depends entirely on the continued availability of habitat in Dixie Meadows.

The following section discusses the potential impacts the Dixie Meadows Geothermal Utilization Project could have on both the current and future status of the Dixie Valley toad. Based on an expert knowledge elicitation (discussed further below) conducted on the potential outcomes of this geothermal project, peak change to the spring system could occur as early as the current year of 2022 (year 1 of geothermal pumping), with a 90 percent chance that peak change will occur within 10 years of the start of geothermal pumping (Service 2022, pp. 42–43).

Dixie Meadows Geothermal Project

In addition to 50 active geothermal leases within Dixie Valley in Churchill County, two geothermal exploration projects were approved in Dixie Meadows in 2010 and 2011 (BLM 2010, entire; BLM 2011, entire). Most recently, on November 23, 2021, BLM approved and permitted the Dixie Meadows Geothermal Utilization Project (BLM 2021b, entire) after issuing two draft environmental assessments, receiving extensive comments from the Service and NDOW, and developing an Aquatic Resources Monitoring and Mitigation Plan (hereafter referred to as the Monitoring and Mitigation Plan). This project will consist of up to two 30–MW geothermal power plants on 6.5 ha (16 ac) each; up to 18 well pads (107×114 m (350×375 ft)), upon which up to three wells per pad may be drilled for exploration, production, or injection; pipelines to carry geothermal fluid between well fields and the power plant(s); and either a 120-kilovolt (kV) or a 230-kV transmission gen-tie and associated access roads and structures (BLM 2021b, p. 1–1). The project proponent (Ormat Nevada Inc. (Ormat)) began construction on the first geothermal plant the week of February 14, 2022, and plans to begin geothermal production by December 2022; therefore, we assume it is possible that both construction and production will occur in 2022. To see a more detailed overview of the approved and permitted project, refer to the BLM environmental assessment (BLM 2021b, entire).

As mentioned above, two geothermal exploration projects were approved by the BLM in 2010 and 2011 (BLM 2010, entire; BLM 2011, entire); however, required monitoring and baseline environmental surveys for those exploration projects did not occur (BLM 2021a, pp. 3–17–3–18). As a result, key environmental information (*e.g.,* water quality metrics data such as flow, water temperature, and water pressure) is lacking to determine the effects of the project on the surrounding environment. Most of the information collected during this timeframe were singular measurements taken quarterly or annually, which do not characterize the variability in environmental conditions observed in Dixie Meadows. The lack of robust baseline environmental information is part of why we, along with experts from the expert knowledge elicitation workshop panel (described below), conclude that the Monitoring and Mitigation Plan associated with the Dixie Meadows Geothermal Utilization Project, discussed further in the Conservation Efforts and Regulatory Mechanisms section, below, needs further refinement to adequately detect and respond to changes in the wetlands and toad populations. The ability of the Monitoring and Mitigation Plan to detect changes in baseline conditions, and mitigate those changes, is discussed further in the Expert Knowledge

Elicitation and Conservation Efforts and Regulatory Mechanisms sections, below.

Expert Knowledge Elicitation

An expert knowledge elicitation workshop was carried out during the period August 17–20, 2021, using the [then] proposed Dixie Meadows Geothermal Utilization Project, January 2021 draft environmental assessment (BLM 2021a, entire) and draft Monitoring and Mitigation Plan (BLM 2021a, Appendix H), and a summary of all existing data to determine the range of outcomes of the approved project. This analysis used a modified version of the Sheffield elicitation framework, which follows established best practices for eliciting expert knowledge (Gosling 2018, entire; O'Hagan 2019, pp. 73–81; Oakley and O'Hagan 2019, entire). The expert panel consisted of a multidisciplinary group with backgrounds in the geologic structure of basin and range systems, various components of deep and shallow groundwater flow, as well as geothermal exploration and development. All panelists have direct experience in the Great Basin, and most in Dixie Valley and Dixie Meadows, specifically. The panelists were asked questions regarding the time until peak changes to the spring system would occur, the ability of the Monitoring and Mitigation Plan to detect and mitigate change, the amount of time it would take to mitigate change if mitigation is possible, and what the peak changes to springflow and spring temperature could be. For a detailed overview of the expert knowledge elicitation process, refer to the SSA report (Service 2022, Appendix A).

The expert panelists concluded that the Dixie Meadows spring system will change quickly, and detrimentally, once geothermal energy production begins, with a median response time of roughly 4 years and a 90 percent chance that the largest magnitude changes will occur within 10 years (Service 2022, Appendix A). Uncertainty within individual judgments on response time was related to the efficacy of mitigation measures and interactions between short-term impacts from geothermal development and longer term impacts from climate change and consumptive water use.

Experts had low confidence in the ability of the Monitoring and Mitigation Plan to both detect and mitigate changes to the temperature and flow of surface springs in Dixie Meadows. Although the aggregated distribution for the ability to detect changes ranged from 0 to 100 percent, the median expectation was a roughly 38 percent chance of detecting changes (Service 2022, Appendix A). These judgments reflect an expectation that there is less than 50 percent confidence from the experts that the Monitoring and Mitigation Plan could detect changes in the spring system due to the complexity and natural variability of the system, limited baseline data, and perceived inadequacies of the Monitoring and Mitigation Plan. The Monitoring and Mitigation Plan was perceived as inadequate due in part to limited monitoring locations, low frequency of monitoring and reporting, and lack of a statistical approach for addressing variability and uncertainty. The degree of confidence in the ability to mitigate environmental impacts of the project was even lower (median of roughly 29 percent; Service 2022, Appendix A) based on previously stated concerns about the plan, lack of information on how water quality would be addressed, interacting effects of climate change and extractive water use, and questions about the motivation to mitigate if measures ran counter to other operating goals of the plant.

The expert panel was asked what timeframe would be required to fully mitigate changes in spring temperature and springflow once detected—assuming that changes have been detected, it is technically feasible to mitigate the problem, and there is a willingness to participate from all parties. Based on those assumptions, the experts judged that it could take multiple years to mitigate perturbations once detected, with a median expectation of 4 years (Service 2022, Appendix A).

At the time the expert knowledge elicitation occurred, the Dixie Meadows Geothermal Utilization Project was not approved. However, in the discussion about expected peak change in spring temperature and springflow, the experts considered how the spring system would change if the geothermal project was not approved or the Monitoring and Mitigation Plan was improved. Expert judgments on expected peak change in spring temperature and springflow that considered the geothermal project not getting approved and an improvement in the Monitoring and Mitigation Plan were not considered in our analysis because the geothermal project was approved (BLM 2021b, entire) in November 2021. Additionally, although the Monitoring and Mitigation Plan was changed, changes were minimal and did not affect the ability of the plan to detect or mitigate changes. Therefore, the results of the expert knowledge elicitation completed on the January 2021 draft environmental assessment and the then-existing Monitoring and Mitigation Plan (BLM 2021a, entire) would not have changed meaningfully in response to the final approved environmental assessment and Monitoring and Mitigation Plan (BLM 2021b, entire).

Although there is large uncertainty in the magnitude of expected changes from the approved project, there is a high degree of certainty that geothermal energy development will have severe and negative effects on the geothermal springs relied upon by the Dixie Valley toad, including reductions in spring temperature and springflow, which directly affect the resource needs of the species. The plausible range of changes to spring temperatures ranged from a lower limit of a 55- °C (99- °F) decrease to an upper limit of a 10- °C (18- °F) decrease (Service 2022, Appendix A). This uncertainty is due to the wide spatial variation in spring temperatures across the spring system and reflects the expectation that the spring temperatures could plausibly drop to ambient levels (*i.e.,* a complete loss of geothermal contributions). Similarly, the lower limit of the aggregated expert judgments considered it plausible that springs in Dixie Meadows could dry up (no surface discharge) as the geothermal contribution was reduced, with an upper limit of a 31-percent decrease in surface discharge. These judgments reflect the high anticipated pumping rates of the proposed plants, perceived inadequacies with the Monitoring and Mitigation Plan, and the fact that drying of surface springs has been documented at other nearby geothermal development projects (BLM 2019, p. 1).

Scenario Considerations for Current and Future Conditions

In the SSA report, we analyzed four scenarios based on the expert knowledge elicitation. As mentioned earlier, these scenarios could plausibly affect both the current and future condition of the species. Three of the scenarios (scenarios 1–3) assume the Dixie Meadows Geothermal Utilization Project will begin construction as approved, while scenario 4 assumes there will be no geothermal development or the Monitoring and Mitigation Plan will be significantly improved before project implementation. Scenario 4 was not considered in this decision given the approval of the geothermal project, the beginning of construction on the project, and the lack of substantive improvements to the Monitoring and Mitigation Plan. As discussed above in the Expert Knowledge Elicitation section, we have low confidence in the ability of the Monitoring and Mitigation

Plan to detect or mitigate changes to the spring system. Therefore, only scenarios 1–3 were considered for this decision.

The scenarios incorporated the following considerations from the expert knowledge elicitation: The efficacy of the Monitoring and Mitigation Plan; how the surficial spring system will respond to geothermal production; and changes in temperature, evapotranspiration, and extreme precipitation events related to climate change. For all scenarios, we project that the basin will remain over-allocated. The lower bound of scenarios (scenario 1) projects that the Monitoring and Mitigation Plan is ineffective, the springs dry completely, and there are increases in air temperature, evapotranspiration, and extreme precipitation events seen under RCP 8.5. This scenario represents the low confidence the experts have in the Monitoring and Mitigation Plan and reflects the results in a similar situation that occurred in Jersey Valley where geothermal production caused the spring system to go dry within 3 years of the start of operation (BLM 2022, p. 1; NDWR 2022, unpublished data). The upper bound of scenarios (scenario 3) projects that the Monitoring and Mitigation Plan is moderately effective, geothermal production has moderate effects on the surficial spring system, and increases in temperature, evapotranspiration, and moderate changes in precipitation seen under RCP 4.5 occur. Because the experts expressed less than 50 percent confidence in the ability of the Monitoring and Mitigation Plan to both detect and mitigate change, it was logical for this scenario to represent the upper bound of plausibility.

These scenarios include the range of peak changes to spring temperature and springflow as discussed earlier (a 55- °C (99- °F)) decrease to a 10- °C (18- °F) decrease in spring temperature and a 100-percent decrease to a 31-percent decrease in springflow). These projected changes in spring temperature and flow were used as inputs into a multistate, dynamic occupancy model, which is described further in the SSA report (Service 2022, pp. 61–64). Scenario 1 results in complete reproductive failure because of the drying of springs, and scenarios 2 and 3 project a risk of reproductive failure after 1 year of geothermal production (lower credible interval of 0 percent of the range occupied by larvae). Under scenario 2, the mean percentage of the range occupied by larvae drops to 0 percent by 2024 with an upper credible interval of 2 percent of the range occupied by larvae. Scenario 3 projects a mean of 1 percent of the range occupied by larvae with an upper credible interval of 5 percent of the range occupied by 2026. All scenarios result in a high level of risk of reproductive failure for the Dixie Valley toad in the near future.

Although the occupancy model described above represents the best available projection framework for the Dixie Valley toad, not all demographic and risk factors relevant to understanding species viability are included. One major threat not accounted for is the synergistic effect of changes in temperature with the risk posed by exposure to the fungal pathogen chytrid fungus that causes the disease chytridiomycosis (see Disease, above). Chytrid fungus growth and survival are sensitive to both cold and hot temperatures, with optimal growth conditions in culture occurring between 15 and 25 °C (59 and 77 °F). There is equivocal evidence on whether colder temperatures limit the effects of chytrid fungus (Voyles et al. 2017, pp. 367–369); however, hot geothermal waters above 25 °C (77 °F) appear to provide protection against chytrid fungus by allowing individuals to raise body temperatures through behavioral fever (Forrest and Schlaepfer 2011, entire; Murphy et al. 2011, p. 39). This information indicates that future decreases in water temperature associated with scenarios 2 and 3 are likely to increase the risk that chytrid fungus could become established within the Dixie Valley toad population. If chytrid fungus becomes established within the Dixie Valley toad population, there would be negative, and plausibly catastrophic, effects to the species.

The seasonal timing of changes in water temperature is also particularly important. Dixie Valley toads strongly rely on aquatic environments throughout their life cycle (Halstead et al. 2021, entire). Unlike Western toads that may be found hundreds to thousands of meters from aquatic breeding sites, in surveys Dixie Valley toads are almost always found in water (Halstead et al. 2021, pp. 30–31). When not detected in water, Dixie Valley toads are found 4.2 m (13.8 ft) from water on average and are found both in and above water during brumation (Halstead et al. 2021, p. 30). Autumn brumation sites are found to be warmer than random locations available, and toads are 1.3 times more likely to select sites for each 1- °C increase in water temperature (Halstead et al. 2021, p. 30). Because toads are found closer to spring heads in autumn compared to sites selected during other times of year, it is likely that they are selecting areas where water temperatures will remain stable throughout the winter (Halstead et al. 2021, p. 34). The selection of areas with stable, warm water temperatures indicates that reductions in geothermal contributions during winter could lead to thermal stress, reductions in available habitat as waters cool, or even mortality if geothermal contributions are removed completely or reduced to a level that toads are unable to adapt their brumation strategies.

Conservation Efforts and Regulatory Mechanisms

The Dixie Valley toad occurs only on Federal lands (the DoD's Fallon Naval Air Station and BLM). Various laws, regulations, policies, and management plans may provide conservation or protections for Dixie Valley toads. As such, the following management plans are the existing conservation tools driving the management of Dixie Valley toads and their habitat:

- As required by the Sikes Act (16 U.S.C. 670 *et seq.,* as amended), the DoD has an integrated natural resources management plan in place for supporting both the installation mission as well as protecting and enhancing installation resources for multiple use, sustainable yield, and biological integrity. This plan also includes a strategic plan for amphibian (and reptile) conservation and management, to include management for Dixie Meadows and the Dixie Valley toad.
- As required by the Federal Land Policy and Management Act of 1976 (43 U.S.C. 1701 *et seq.*), BLM has a resource management plan for all actions and authorizations involving BLM-administered lands and resources, including actions specific to Dixie Valley toads and their habitat.

In compliance with the National Environmental Policy Act of 1970 (as amended; 42 U.S.C. 4321 *et seq.*), which is a procedural statute, for projects that Federal agencies fund, authorize, or carry out, BLM, with input from Ormat, developed a Monitoring and Mitigation Plan (McGinley and Associates 2021, entire) for the Dixie Meadows Geothermal Utilization Project; it is an appendix in BLM's environmental assessment (BLM 2021b, Appendix H). The goal of the Monitoring and Mitigation Plan is to identify hydrologic and biologic resources, spring-dependent ecosystems, aquatic habitat, and species that could be affected by geothermal exploration, production, and injection in the Dixie Meadows area (McGinley and Associates 2021, p. 1). The Monitoring and Mitigation Plan will describe the plan Ormat would implement to monitor and mitigate potential effects to those resources, ecosystems, habitat, and species (McGinley and Associates 2021, p. 1).

The Monitoring and Mitigation Plan includes adaptive management and mitigation measures that Ormat would implement if changes are detected in baseline conditions and threshold values are exceeded. Management actions may include geothermal reservoir pumping and injection adjustments (*e.g.,* redistribution of injection between shallow and deep aquifers). Other more aggressive actions include augmenting affected springs with geothermal fluids or fresh water to restore preproduction temperature, flow, stage, and water chemistry. The Monitoring and Mitigation Plan states that if mitigation actions are not sufficient for the protection of species and aquatic habitat, pumping and injection would be suspended until appropriate mitigation measures are identified, implemented, and shown to be effective (McGinley and Associates 2021, p. 34).

We, along with other interested parties (*e.g.,* Department of the Navy, NDOW) provided comments to the BLM regarding the Monitoring and Mitigation Plan, which was first made available to the public in January 2021. We have low confidence in the ability of the Monitoring and Mitigation Plan to adequately detect and respond to changes because of the complexity and natural variability of the spring system, limited baseline data, and perceived inadequacies of the plan. We determined the Monitoring and Mitigation Plan is inadequate because of the inadequate time to collect relevant baseline information prior to beginning operation of the plant, limited monitoring locations, low frequency of monitoring and reporting, lack of a statistical approach for addressing variability and uncertainty, lack of information on how water quality would be addressed, interacting effects of climate change and extractive water use, and uncertainty about mitigation if measures ran counter to other operating goals of the plant.

The Dixie Valley toad is classified as protected by the State of Nevada under Nevada Administrative Code (NAC) 503.075(2)(b). Per NAC 503.090(1), there is no open season on those species of amphibian classified as protected. Per NAC 503.094, the State issues permits for the take and possession of any species of wildlife for strictly scientific or educational purposes. The State's Department of Conservation and Natural Resources includes the Nevada Division of Natural Heritage (NDNH), which tracks the species status of plants and animals in Nevada. The NDNH recognizes Dixie Valley toads as critically imperiled, rank *S1*. Ranks of *S1* are defined as species with very high risks of extirpation in the jurisdiction due to very restricted range, very few populations or occurrences, very steep declines, severe threats, or other factors.

Determination of Status for the Dixie Valley Toad

Section 4 of the Act (16 U.S.C. 1533) and its implementing regulations (50 CFR part 424) set forth the procedures for determining whether a species meets the definition of ''endangered species'' or ''threatened species.'' The Act defines an ''endangered species'' as a species in danger of extinction throughout all or a significant portion of its range and a ''threatened species'' as a species likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. The Act requires that we determine whether a species meets the definition of an ''endangered species'' or a ''threatened species'' because of any of the following factors: (A) The present or threatened destruction, modification, or curtailment of its habitat or range; (B) overutilization for commercial, recreational, scientific, or educational purposes; (C) disease or predation; (D) the inadequacy of existing regulatory mechanisms; or (E) other natural or manmade factors affecting its continued existence.

In conducting our status assessment of the Dixie Valley toad, we evaluated all identified threats under the Act's section 4(a)(1) factors and assessed how the cumulative impact of all threats acts on the viability of the species as a whole. That is, all the anticipated effects from both habitat-based and direct mortality-based threats are examined in total and then evaluated in the context of what those combined negative effects will mean to the future condition of the Dixie Valley toad.

Status Throughout All of Its Range

After evaluating threats to the species and assessing the cumulative effect of the threats under the section 4(a)(1) factors, we determined that the Dixie Valley toad is at risk of extinction throughout its range primarily due to the approval and commencement of geothermal development. Other threats identified in this status determination include increased severity of drought due to climate change (Factor A), the threat of chytrid fungus establishing itself in the population (Factor C), groundwater pumping associated with human consumption, agriculture, and county planning (Factor A), and predation by invasive bullfrogs (Factor C). These three threats will likely exacerbate the main threat of geothermal development. Existing regulatory mechanisms do not address the primary threat to the species (Factor D).

Construction of the Dixie Meadows Geothermal Utilization Project has begun, and geothermal production is assumed to begin before the end of 2022. Based upon the best available scientific and commercial information as described in this determination, the Service has a high degree of certainty that geothermal production will have severe, negative effects on the geothermal springs the species relies upon for habitat (Factor A). These negative effects include reductions in spring temperature and springflow, which directly affect the needs of the species (*i.e.,* adequate water temperature, sufficient wetted areas, sufficient wetland vegetation, including vegetation cover, and adequate water quality (see *Species Needs,* above)). The best available information indicates that a complete reduction in springflow and significant reduction of water temperature are plausible outcomes of the geothermal project, and these conditions could result in the species no longer persisting (*i.e.,* becoming extinct or functionally extinct as a result of significant habitat degradation, or no reproduction due to highly isolated, non-recruiting individuals).

The narrowly distributed, isolated nature of the single, small population of the species indicates that the Dixie Valley toad will have no ability to withstand stochastic or catastrophic events through dispersal. Because the species occurs in only one spring system and has experienced little historical variation, it has low potential to adapt to a fast-changing environment. As a single-site endemic with no dispersal opportunities outside the current range and low adaptive capacity, the species has inherently low redundancy and representation, and depends entirely on the continued availability of wetland habitat in Dixie Meadows. Low redundancy and representation make the Dixie Valley toad particularly vulnerable to fast-paced change to its habitat and catastrophic events, any of which could plausibly result from the permitted Dixie Meadows Geothermal Utilization Project.

The Dixie Valley toad exists in one population that will likely be directly affected to a significant degree by geothermal production in a short timeframe, resulting in a high risk that the species could become extinct.

In addition to the current development of the geothermal project, a combination of threats will act synergistically to exacerbate effects from geothermal production on the Dixie Meadows spring system. A reduction in springflow could be exacerbated by the greater severity of droughts being experienced in the Southwestern United States, including Nevada (Snyder et al. 2019, pp. 2–4; Williams et al. 2020, pp. 1–5). Higher temperatures and drier conditions could result in greater evapotranspiration, leading to increased drying of wetland habitat. A reduction in water temperature could allow chytrid fungus to become established and negatively impact the Dixie Valley toad population. Chytrid fungus would likely be catastrophic to Dixie Valley toads, as it has caused severe declines in other amphibian species, and the fungus has been found in another known vector species (bullfrog) in Dixie Valley (Forrest 2013, p. 77). Bullfrogs themselves are a threat to the species, as Dixie Valley toads could be easily preyed upon because of their small size. If bullfrogs were to become established throughout Dixie Valley toad habitat, there would likely be a reduction in Dixie Valley toad abundance.

Thus, after assessing the best available information, we conclude that the Dixie Valley toad is currently in danger of extinction throughout all of its range due to the immediacy of the threat of geothermal production, including negative effects such as reductions in spring temperature and springflow, which would directly affect the needs of the species (*i.e.,* adequate water temperature, sufficient wetted areas, sufficient wetland vegetation, including vegetation cover, and adequate water quality), and low confidence in the ability of the Mitigation and Monitoring Plan to effectively minimize and mitigate for potential effects that are likely to manifest in the near term. We find that threatened species status is not appropriate because the threat of extinction is imminent as opposed to being likely to develop within the foreseeable future.

Status Throughout a Significant Portion of Its Range

Under the Act and our implementing regulations, a species may warrant listing if it is in danger of extinction or likely to become so in the foreseeable future throughout all or a significant portion of its range. We have determined that the Dixie Valley toad is in danger of extinction throughout all of its range and, accordingly, did not undertake an analysis of any significant portion of its range. Because the Dixie Valley toad warrants listing as endangered throughout all of its range, our determination does not conflict with the decision in *Center for Biological Diversity* v. *Everson,* 435 F. Supp. 3d 69 (D.D.C. 2020), because that decision related to SPR analyses for species that warrant listing as threatened, not endangered, throughout all of their range.

Determination of Status

Our review of the best available scientific and commercial information indicates that the Dixie Valley toad meets the definition of an endangered species. For the reasons discussed below, we further find that the threats facing the Dixie Valley toad at this time constitute an emergency posing a significant risk to the well-being of the Dixie Valley toad. Therefore, we are emergency listing the Dixie Valley toad as an endangered species in accordance with sections 3(6), 4(a)(1), and 4(b)(7) of the Act.

Reasons for Emergency Determination

Under section 4(b)(7) of the Act and regulations at 50 CFR 424.20, we may emergency list a species if the threats to the species constitute an emergency posing a significant risk to its well-being. An emergency listing expires 240 days following publication in the **Federal Register** unless, during this 240-day period, we list the species following the normal listing procedures. In accordance with the Act, if at any time after we publish this emergency rule, we determine that substantial evidence does not exist to warrant such a rule, we will withdraw it.

We conclude that emergency listing the Dixie Valley toad as endangered is warranted. In making this determination, we have carefully assessed the best scientific and commercial data available regarding the past, present, and future threats faced by the Dixie Valley toad. As discussed above in detail, the Dixie Meadows Geothermal Utilization Project poses a high degree of threat to the Dixie Valley toad, such that it poses a significant risk to the well-being of the species. Moreover, the project has been permitted, construction has already begun, and power plant production is projected to begin this calendar year. Significant and possibly irreversible negative impacts to the species may occur before listing could become effective following completion of the usually required rulemaking procedures for listing a species. We therefore conclude that the current circumstances constitute an emergency.

By emergency listing the Dixie Valley toad as an endangered species, the protections of the Act (through sections 7, 9, and 10) and recognition that will immediately become available to the species will increase the likelihood that it can be saved from extinction.

Available Conservation Measures

Conservation measures provided to species listed as endangered or threatened species under the Act include recognition, recovery actions, requirements for Federal protection, and prohibitions against certain practices. Recognition through listing results in public awareness, and conservation by Federal, State, Tribal, and local agencies, private organizations, and individuals. The Act encourages cooperation with the States and requires that recovery actions be carried out for listed species. The protection required by Federal agencies and the prohibitions against certain activities are discussed, in part, below.

The primary purpose of the Act is the conservation of endangered and threatened species and the ecosystems upon which they depend. The ultimate goal of such conservation efforts is the recovery of these listed species, so that they no longer need the protective measures of the Act. Section 4(f) of the Act calls for the Service to develop and implement recovery plans for the conservation of endangered and threatened species. The recovery planning process involves the identification of actions that are necessary to halt or reverse the species' decline by addressing the threats to its survival and recovery. The goal of this process is to restore listed species to a point where they are secure, self-sustaining, and functioning components of their ecosystems.

Recovery planning includes the development of a recovery outline shortly after a species is listed and preparation of a draft and final recovery plan. The recovery outline guides the immediate implementation of urgent recovery actions and describes the process to be used to develop a recovery plan. Revisions of the plan may be done to address continuing or new threats to the species, as new substantive information becomes available. The recovery plan identifies site-specific management actions that set a trigger for review of the five factors that control whether a species remains endangered or may be downlisted or delisted and methods for monitoring recovery progress. Recovery plans also establish a framework for agencies to coordinate their recovery efforts and provide estimates of the cost of implementing recovery tasks. Recovery teams (composed of species experts, Federal and State agencies, nongovernmental organizations, and stakeholders) are often established to develop recovery plans. When completed, the recovery outline, draft recovery plan, and the final recovery plan will be available on our website (*http://www.fws.gov/endangered*) (see **FOR FURTHER INFORMATION CONTACT**).

Implementation of recovery actions generally requires the participation of a broad range of partners, including other Federal agencies, States, Tribes, nongovernmental organizations, businesses, and private landowners. Examples of recovery actions include habitat restoration (*e.g.,* restoration of native vegetation), research, captive propagation and reintroduction, and outreach and education.

Following publication of a final listing rule, funding for recovery actions is available from a variety of sources, including Federal budgets, State programs, the academic community, and nongovernmental organizations. In addition, pursuant to section 6 of the Act, the State of Nevada will be eligible for Federal funds to implement management actions that promote the protection or recovery of the Dixie Valley toad. Information on our grant programs that are available to aid species recovery can be found at: *http://www.fws.gov/grants.*

Although the Dixie Valley toad is only emergency listed under the Act at this time, please let us know if you are interested in participating in recovery efforts for this species. Additionally, we invite you to submit any new information on this species whenever it becomes available and any information you may have for recovery planning purposes (see **FOR FURTHER INFORMATION CONTACT**).

Section 7(a) of the Act requires Federal agencies to evaluate their actions with respect to any species that is listed as an endangered or threatened species and with respect to its critical habitat, if any is designated. Regulations implementing this interagency cooperation provision of the Act are codified at 50 CFR part 402. Section 7(a)(4) of the Act requires Federal agencies to ensure that activities they authorize, fund, or carry out are not likely to jeopardize the continued existence of any endangered or threatened species or destroy or adversely modify its critical habitat. If a Federal action may affect a listed species or its critical habitat, the responsible Federal agency must enter into consultation with the Service.

Federal agency actions within the species' habitat that may require conference or consultation or both as described in the preceding paragraph may include, but are not limited to, management and any other landscape-altering activities on Federal lands: Aquatic habitat restoration, fire management plans, fire suppression, fuel reduction treatments, mining permits, integrated natural resources management plans, land resource management plans, oil and natural gas permits, renewable energy development, renewable and alternative energy projects, and geothermal project approvals and implementation.

The Act and its implementing regulations set forth a series of general prohibitions and exceptions that apply to endangered wildlife. The prohibitions of section 9(a)(1) of the Act, codified at 50 CFR 17.21, make it illegal for any person subject to the jurisdiction of the United States to take (which includes harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect; or to attempt any of these) endangered wildlife within the United States or on the high seas. In addition, it is unlawful to import; export; deliver, receive, carry, transport, or ship in interstate or foreign commerce in the course of commercial activity; or sell or offer for sale in interstate or foreign commerce any species listed as an endangered species. It is also illegal to possess, sell, deliver, carry, transport, or ship any such wildlife that has been taken illegally. Certain exceptions apply to employees of the Service, the National Marine Fisheries Service, other Federal land management agencies, and State conservation agencies.

We may issue permits to carry out otherwise prohibited activities involving endangered wildlife under certain circumstances. Regulations governing permits are codified at 50 CFR 17.22. With regard to endangered wildlife, a permit may be issued for the following purposes: For scientific purposes, to enhance the propagation or survival of the species, and for incidental take in connection with otherwise lawful activities. The statute also contains certain exemptions from the prohibitions, which are found in sections 9 and 10 of the Act.

It is our policy, as published in the **Federal Register** on July 1, 1994 (59 FR 34272), to identify to the maximum extent practicable at the time a species is listed those activities that would or would not constitute a violation of section 9 of the Act. Based on the best available information, the following actions are unlikely to result in a violation of section 9, if these activities are carried out in accordance with existing regulations and permit requirements; this list is not comprehensive:

(1) Vehicle use on existing roads and trails in compliance with the BLM Carson City District's resource management plan.

(2) Recreational use with minimal ground disturbance (*e.g.,* hiking, walking).

Based on the best available information, the following activities may potentially result in a violation of section 9 of the Act if they are not authorized in accordance with applicable law, including the Endangered Species Act; this list is not comprehensive:

(1) Unauthorized handling or collecting of the species;

(2) Unauthorized livestock grazing that results in direct mortality and direct or indirect destruction of vegetation and aquatic habitat;

(3) Destruction/alteration of the species' habitat by draining, ditching, stream channelization or diversion, or diversion or alteration of surface or ground water flow into or out of the wetland;

(4) Introduction of nonnative species that compete with or prey upon the Dixie Valley toad or wetland vegetation;

(5) The unauthorized release of biological control agents that attack any life stage of the Dixie Valley toad;

(6) Modification of the vegetation components on sites known to be occupied by the Dixie Valley toad; and

(7) Modification of spring and wetland water temperatures.

Questions regarding whether specific activities would constitute a violation of section 9 of the Act should be directed to the Reno Ecological Services Field Office (see **FOR FURTHER INFORMATION CONTACT**).

Required Determinations

National Environmental Policy Act (42 U.S.C. 4321 et seq.)

It is our position that, outside the jurisdiction of the U.S. Court of Appeals for the Tenth Circuit, we do not need to prepare environmental analyses pursuant to the National Environmental Policy Act (42 U.S.C. 4321 *et seq.*) in connection with regulations adopted pursuant to section 4(a) of the Act. We published a notice outlining our reasons for this determination in the **Federal Register** on October 25, 1983 (48 FR 49244). This position was upheld by the U.S. Court of Appeals for the Ninth Circuit (*Douglas County* v. *Babbitt,* 48 F.3d 1495 (9th Cir. 1995), cert. denied 516 U.S. 1042 (1996)).

Government-to-Government Relationship With Tribes

In accordance with the President's memorandum of April 29, 1994

(Government-to-Government Relations with Native American Tribal Governments; 59 FR 22951, May 4, 1994), E.O. 13175 (Consultation and Coordination with Indian Tribal Governments), and the Department of the Interior's manual at 512 DM 2, we readily acknowledge our responsibility to communicate meaningfully with recognized Federal Tribes on a government-to-government basis. In accordance with Secretarial Order 3206 of June 5, 1997 (American Indian Tribal Rights, Federal-Tribal Trust Responsibilities, and the Endangered Species Act), we readily acknowledge our responsibilities to work directly with Tribes in developing programs for healthy ecosystems, to acknowledge that Tribal lands are not subject to the same controls as Federal public lands, to remain sensitive to Indian culture, and to make information available to Tribes. We requested information from the Paiute-Shoshone Tribe of the Fallon Reservation and Colony and have continued to coordinate during the SSA process. We are requesting the Tribe's partner review of the SSA report concurrent with the open comment period identified in the proposed rule that is published concurrently with this emergency rule and found in the Proposed Rules section of this issue of the **Federal Register** (see Docket No. FWS–R8–ES–2022–0024 in *https://www.regulations.gov*). We will continue to work with Tribal entities during the development of a final listing determination for the Dixie Valley toad.

References Cited

A complete list of references cited in this rulemaking is available on the internet at *https://www.regulations.gov* and upon request from the Reno Fish and Wildlife Office (see **FOR FURTHER INFORMATION CONTACT**).

Authors

The primary authors of this rule are the staff members of the Fish and Wildlife Service's Species Assessment Team and the Reno Fish and Wildlife Office.

List of Subjects in 50 CFR Part 17

Endangered and threatened species, Exports, Imports, Reporting and recordkeeping requirements, Transportation.

Regulation Promulgation

Accordingly, we amend part 17, subchapter B of chapter I, title 50 of the Code of Federal Regulations, as set forth below:

PART 17—ENDANGERED AND THREATENED WILDLIFE AND PLANTS

■ 1. The authority citation for part 17 continues to read as follows:

Authority: 16 U.S.C. 1361–1407; 1531–1544; and 4201–4245, unless otherwise noted.

■ 2. Amend § 17.11 in paragraph (h) by adding an entry for ''Toad, Dixie Valley'' to the List of Endangered and Threatened Wildlife in alphabetical order under Amphibians to read as follows:

§ 17.11 Endangered and threatened wildlife.

* * * * *

(h) * * *

Common name	Scientific name	Where listed	Status	Listing citations and applicable rules
* * * * * * *				
AMPHIBIANS				
* * * * * * *				
Toad, Dixie Valley	*Anaxyrus williamsi*	Wherever found	E	87 FR [INSERT **Federal Register** PAGE WHERE THE DOCUMENT BEGINS]; 4/7/2022.
* * * * * * *				

* * * * *

Martha Williams,
Director, U.S. Fish and Wildlife Service.

[FR Doc. 2022–07374 Filed 4–6–22; 8:45 am]

BILLING CODE 4333–15–P

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

50 CFR Part 648

[Docket No. 220404–0083]

RIN 0648–BL15

Fisheries of the Northeastern United States; Atlantic Spiny Dogfish Fishery; 2022 Specifications and Trip Limit Adjustment

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Final rule.

SUMMARY: NMFS issues final Atlantic spiny dogfish specifications for the 2022 fishing year, and an adjustment to the commercial trip limit, as recommended by the Mid-Atlantic and New England Fishery Management Councils. This action is necessary to establish allowable harvest levels and other management measures to prevent overfishing while enabling optimum yield, using the best scientific information available. This rule also informs the public of the final fishery 2022 specifications and management measures.

DATES: Effective on May 1, 2022.

ADDRESSES: The Mid-Atlantic Fishery Management Council prepared a Supplemental Information Report (SIR) for these specifications that describes the action, any changes from the original environmental assessment (EA), and analyses for this 2022 specifications trip limit adjustment action. Copies of the SIR, original EA, and other supporting documents for this action, are available upon request from Dr. Christopher M. Moore, Executive Director, Mid-Atlantic Fishery Management Council, Suite 201, 800 North State Street, Dover, DE 19901. These documents are also accessible via the internet at *https://www.mafmc.org/supporting-documents.*

FOR FURTHER INFORMATION CONTACT: Cynthia Ferrio, Fishery Policy Analyst, (978) 281–9180.

SUPPLEMENTARY INFORMATION:

Background

The Mid-Atlantic and New England Fishery Management Councils jointly manage the Atlantic Spiny Dogfish Fishery Management Plan (FMP), with the Mid-Atlantic Council acting as the administrative lead. Additionally, the Atlantic States Marine Fisheries Commission manages the spiny dogfish fishery in state waters from Maine to North Carolina through an interstate