United States Department of the Interior

FISH AND WILDLIFE SERVICE

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In Reply Refer To:
FWS/AES/DER/BNC/084458
2023-0083749-S7

Sarah Dunham
Director, Office of Transportation, Office of Air and Radiation
United States Environmental Protection Agency
U.S. Environmental Protection Agency
1200 Pennsylvania Ave.
NW Washington, D.C. 20460

RE: Concurrence Letter for the Environmental Protection Agency's (EPA) Renewable Fuel Standard (RFS) Set Rule 2

Dear Ms. Dunham:

On March 20, 2026, the United States Fish and Wildlife Service (the Service) received a request for a written concurrence that the Environmental Protection Agency's (EPA) rulemaking for the Renewable Fuel Standard (RFS) Program: Standards for 2026 and 2027, Partial Waiver of 2025 Cellulosic Biofuel Volume Requirement, and Other Changes (Set 2 Rule), is not likely to adversely affect species listed as threatened or endangered and critical habitats designated under our jurisdiction under the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.).

In this response, we describe EPA's conclusions, proposed action, delineation of their action area, and models it used to estimate general environmental changes resulting from the action, while highlighting uncertainties and overestimations associated with their assessments and calculations. We explain our effects analysis, assessment of uncertainties, and for the reasons noted below, our concurrence with EPA's determination that the action may affect, but is not likely to adversely affect, all ESA-listed species and designated critical habitats listed in Appendix 1.

Some of the information and analyses considered in this document were prepared under the version of the 50 CFR part 402 regulations in effect prior to the U.S. District Court for the Northern District of California's order in *Center for Biological Diversity v. Dept. of the Interior*, No. 24-cv-04651 (N.D. Cal., March 30, 2026), which vacated aspects of four provisions from the 50 CFR part 402 regulations governing interagency consultation under section 7 of the Endangered Species Act and reinstated the provisions that were previously in effect. We reviewed this information and our analyses, including but not limited to, the consultation request package, and confirmed that the content, including the identification and analyses of effects, would be the same under either version of the applicable regulations. In our analyses, we applied the versions of the regulations reinstated by the Court.

Summary of EPA's Effect Determinations and Conclusions

EPA made a "may affect" determination for the RFS Set 2 Rule after determining that their action area intersected with ESA-listed species ranges and designated critical habitats.[1] EPA also determined that the proposed action was "not likely to adversely affect" listed species or designated critical habitat because the potential effects of the action would be considered either discountable or insignificant.[2]

EPA identified 757 ESA-listed species and 246 designated critical habitats (including proposals for each) under Service jurisdiction that potentially occur in the action area (*see* Attachment 1 of the BE) and concluded that the action may affect, but is not likely to adversely affect ESA-listed species and designated critical habitats. Experimental populations (ESA section 10(j)) present in the action area are considered as a single listed entity within ESA-listed species' populations for the purposes of this consultation rather than discussed separately.

In its BE, EPA included the following rationale, in part, for its conclusions:

> For non-crop-based biofuels, such as Compressed Natural Gas (CNG) and Liquified Natural Gas (LNG) derived from biogas and biodiesel and renewable diesel produced from waste fats, oils and greases, we determined there would be no effect on listed species and critical habitat. In addition, this action implements regulatory changes that will not impact the volumes of renewable fuel and will also not impact listed species or critical habitat because they are administrative in nature.
>
> For crop-based biofuels such as corn ethanol, soybean biodiesel, and canola biodiesel, we determined that the increased consumption and production may affect listed species. Ultimately, the increase in demand for feedstocks used to produce renewable fuels could potentially lead to an increase in the amount of land used to produce these crops. Listed species could potentially be impacted by loss of physical and biological features (PBFs) in critical habitat or loss of range to cropland, or by water quality impacts from increased loads of fertilizers and pesticides. In this BE, we identified the action area where these impacts could occur and found that 821 unique populations may be impacted by the action.
>
> However, our analyses conclude that impacts from the RFS Set 2 Rule, if any, would be insignificant and/or discountable. First and foremost, we reach this conclusion because of various uncertainties and complex causal chain of steps, including the many economic, administrative, and legal hurdles, that occur in between the EPA setting the RFS volume requirements to potential on-the-ground land use changes (Figure 1).

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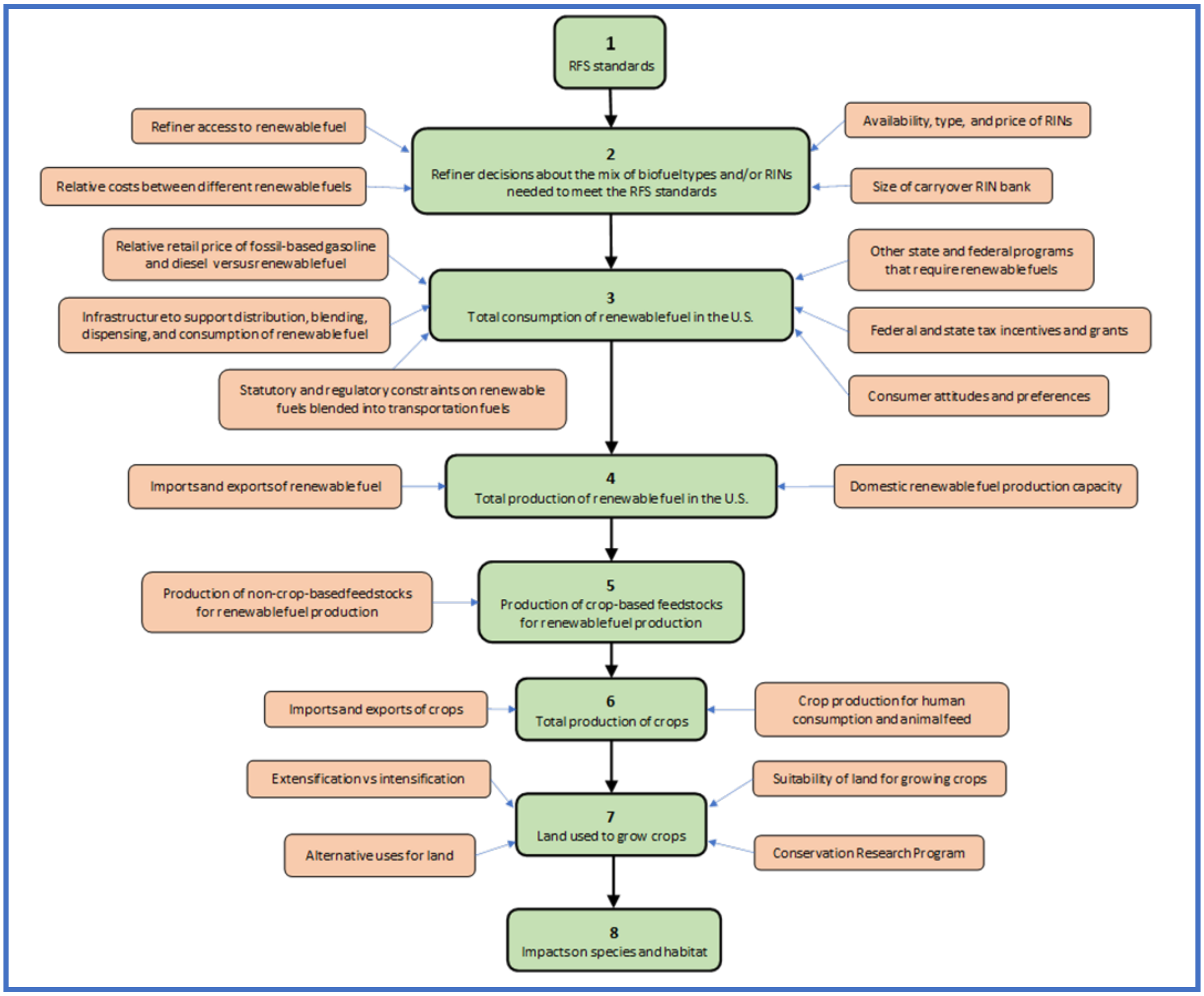
[1] The ESA Section 7 Consultation Handbook ("Handbook") indicates that a "may affect" determination is appropriate when "a proposed action *may pose any effects* on listed species or critical habitat." *See* U.S. Fish and Wildlife Service and National Marine Fisheries Service, Final Endangered Species Act Consultation Handbook, xvi (1998) (emphasis added).

[2] The ESA Section 7 Handbook provides guidance explaining that insignificant effects relate to the size of the impact and should never reach the scale where take occurs, and discountable effects are those extremely unlikely to occur. Based on best judgment, a person would not: (1) be able to meaningfully measure, detect, or evaluate insignificant effects; or (2) expect discountable effects to occur. *Id.* at xv-xvi.

In the following several sections, we summarize how EPA reached this conclusion through describing their action, delineating their action area, and modeling effects to ESA-listed species and critical habitats.

Figure 1. From Appendix A, Figure A-1 of EPA 2026. Causal Chain Between RFS Standards and Impacts on Species and Habitat.



Description of EPA's Proposed Action

The RFS Set 2 Rule involves numerous EPA authorities, requirements, and regulatory changes. EPA provided a detailed description of the program in their final biological evaluation (USEPA 2026a; hereafter, referred to as the BE). The following is a brief summary of the action incorporating information from the BE that highlights portions that are the most relevant to our determination; we also incorporate EPA's description of its proposed action by reference (*see* BE page 20).

Congress created the RFS program to reduce greenhouse gas emissions and enhance energy security through expanding the Nation's use of renewable fuels. RFS was created under the Energy Policy Act of 2005 (EPAct), which amended the Clean Air Act (CAA). The Energy Independence and Security Act of 2007 (EISA) further amended the CAA by expanding the RFS program. Under CAA section 211(o), the RFS program requires that certain minimum volumes of renewable fuels must be used in the transportation sector for all years after 2005, with the goal of replacing or reducing the quantity of petroleum-based transportation fuel, heating oil, or jet fuel. Section 211(o) contains specific renewable fuel volume targets through 2022 and provides EPA the authority for setting volumes for 2023 and beyond. EPA's action for the current rulemaking is to establish volume requirements for the use of renewable fuels in the transportation sector for years 2026–2027.

The RFS program places an obligation on producers and importers of gasoline and diesel (hereafter simplified to "refiners") to utilize certain amounts of renewable fuel to replace fossil-based transportation fuels. The obligation is presented as a percentage standard that each refiner multiplies by its gasoline and diesel production and importation to determine the volume of renewable fuel for which it is responsible (e.g., the gallons of renewable fuel mixed with fossil-based fuel for the consumer market). The RFS program does not create an obligation for any individual party (e.g., individual farmers, grain mills, renewable fuel producers) to produce or use any amount or type of renewable fuel. And, there are many economic, administrative, and legal hurdles between when EPA finalizes the RFS Set 2 Rule and how farmers ultimately decide to manage their annual crop production (e.g., market forces, yearly budgets). Ultimately, renewable fuel producers (e.g., those producing ethanol, soy, and canola oil) respond in typical market fashion to the demand for their products that is created by the RFS blending obligations placed upon refiners.

The applicable standards under the RFS program fall into four broad categories that are defined by the estimated greenhouse gas (GHG) benefits achieved by each renewable fuel relative to the petroleum-based fuels that they replace as well as some additional criteria. The statutory criteria for each category of renewable fuel in the RFS program are shown in Table 1.

Table 1. From Table III.A-1 of USEPA 2026a: Statutory Criteria for Renewable Fuel Under the RFS Program.

Category	Minimum GHG Reduction Requirement	Other Requirements and Exclusions
Cellulosic biofuel	60%	Must be made from cellulose, hemi-cellulose, or lignin
Biomass-based diesel	50%	Includes only biodiesel and renewable diesel, but excludes any renewable fuel that is produced through co-processing a feedstock with petroleum
Advanced biofuel	50%	Excludes ethanol derived from corn starch
Renewable fuel	20%[a]	Must be made from qualifying renewable biomass

[a] Does not apply to "grandfathered" renewable fuel produced in a facility that was operational or under construction before December 2007.

In Table 2, EPA showed the volume targets for the RFS Set 2 Rule specified in Renewable Identification Numbers (RINs) that serve as credits (i.e., currency for compliance) used by the

RFS program. Proposed volume requirements are not requirements for the use of specific types of renewable fuels, and thus regulated parties can and will use a variety of different renewable fuel types as long as they meet the qualifications (*see* Table 1). With the Set 2 Rule, the EPA will only set the overall applicable volumes of renewable fuel that are required to be used in 2026 and 2027. Which types of fuels from which feedstocks and in what quantities ultimately are used depends on the market. While the RFS Set 2 Rule does not specify how refiners are to meet their RFS obligations for years 2026–2027, domestically-grown crops for production of renewable fuel have played a role in the RFS program since it was established in 2005 as one option used by refiners to meet their obligations.

Table 2. From Table IV.A.1-1 of USEPA 2026a[3]: Proposed Volume Targets (billion RINs)[a].

Category	2026	2027
Cellulosic biofuel	1.29	1.36
Biomass-based diesel	8.69	9.19
Advanced biofuel	0.25	0.25
Renewable fuel	24.02	24.46

[a] One RIN is equivalent to one ethanol-equivalent gallon of renewable fuel.

Non-crop-based biofuels (i.e., cellulosic biofuels) are a small component of the RFS program standards (Table 2; 2% of all renewable fuel produced in the U.S.). Biogas from landfills is the largest source of cellulosic biofuel (90%), followed by biogas from agricultural digester and waste treatment plant sources (Table 3). Neither landfills nor wastewater treatment plants are built for the purpose of producing biogas. Instead, they are built for waste disposal of wastes, and biogas is a byproduct of their operation. EPA expected it is likely that no landfills or wastewater treatment plants will be built for the purpose of producing the biogas that would qualify as renewable fuel under the RFS program. In contrast, agricultural digesters are typically built for biogas generation; they typically process manure or crop residue such as corn stover. Therefore, new agricultural digesters may be built, and EPA expected new ones would be located on existing farmlands. Therefore, EPA cited no reasonably certain causal link could be established to the RFS Set 2 Rule, and thus no causal impact on land use change or other environmental impact could be attributed to the RFS Set 2 Rule (*see* BE page 30).

The full list of renewable fuel types and feedstocks that qualify under the RFS is provided in the Code of Federal Regulations (Table 1, Section 1426, part 80, Title 40). In practice, however, certain renewable fuels have dominated the transportation fuels market while others have been used in very small quantities or not at all. The tables below show the fuel types and feedstocks that were produced in the U.S. between 2016 and 2024 for cellulosic biofuel, non-cellulosic advanced biofuel, and conventional renewable fuel, along with the average contribution that each has made to the total volume over that timeframe. Natural gas (Table 3), soybean oils and waste oils (Table 4), and corn starch (Table 5) contributed the most to the fuel and feedstocks between 2016-2024 in the U.S. Table 6 shows the average proportions for crop-based versus non-crop-based feedstocks produced domestically, which shows a large majority is from crop-based feedstocks. Fuel types and feedstocks not shown were produced in only negligible quantities or

[3] Volume targets were proposed by EPA in June 2025 (USEPA 2025a); On April 1, 2026, EPA published their final rule with updated volume targets (USEPA 2026b). Because EPA used the proposed targets in their simulations (*see* footnote 5 below), they provided proposed volume targets in their final BE (USEPA 2026a).

not at all. The historical proportions shown in Tables 3-6 do not necessarily represent what might be expected in the future, but EPA's projections of the possible mix of renewable fuel types that could be used in the near future were based on a combination of information about historical trends and a knowledge of feedstock availability, infrastructure, and various other opportunities and constraints for the future.

Table 3. From Table III.C-1 of USEPA 2026a: Fuel/Feedstock Combinations for Cellulosic Biofuel That Were Produced in the U.S. From 2016–2024.

Fuel Type	Feedstock	Average Contribution to Total
CNG/LNG[a]	Landfill	80%
CNG/LNG	Agricultural digester	15%
CNG/LNG	Waste treatment plant	2.5%
Ethanol	Agricultural Residues	1.5%
CNG/LNG	All Others	0.4%
Ethanol	All Others	0.2%
Cellulosic Heating Oil and Diesel	All Feedstocks	0.2%

[a] CNG = compressed natural gas; LNG = liquified natural gas

Table 4. From Table III.C-2 of USEPA 2026a: Fuel/Feedstock Combinations for Non-Cellulosic Advanced Biofuel That Were Produced in the U.S. From 2016–2024.

Fuel Type	Feedstock	Average Contribution to Total
Biodiesel	Soybean Oil	32%
Renewable diesel	Waste Oils/Fats/Greases	23%
Biodiesel	Waste Oils/Fats/Greases	12%
Renewable diesel	Soybean Oil	10%
Biodiesel	Canola Oil	7%
Biodiesel	Corn Oil	6%
Renewable diesel	Corn Oil	6%
Renewable diesel	Canola Oil	2%
All Others	All Others	1%
Gasoline/naphtha	Separated Food Wastes	1%
Ethanol	Separated Food Wastes	1%
Gasoline/naphtha	All Others	0.4%

Table 5. From Table III.C-3 of USEPA 2026a: Fuel/Feedstock Combinations for Conventional Renewable Fuel That Were Produced in the U.S. From 2016–2024.

Fuel Type	Feedstock	Average Contribution to Total
Ethanol	Corn starch	>99%
Ethanol	Grain Sorghum	<1%

Table 6. From Table III.C-4 of USEPA 2026a: Average Proportions From 2016–2024 for Domestically Produced Feedstocks Used to Produced Biofuel.

	Cellulosic	Non-Cellulosic Advanced	Conventional
Crop-based	<1%	63%	>99%
Non-crop-based	>99%	37%	<1%

The predominant feedstock for 2016-2024 renewable fuel production was crop-based feedstock consisting of corn, soybean, and canola. Although there is some uncertainty regarding the extent to which domestically-grown crop-based feedstocks will be used by refiners to comply with the RFS Set 2 Rule (as opposed to other economic, market, and regulatory factors), based on past observations and the best scientific and commercial data available, these crops are expected to remain the predominant crop-based feedstocks produced domestically to meet the RFS Set 2 Rule volumes for 2026–2027 (Table 7).

Table 7. From Table IV.A.1-2 of USEPA 2026a: Projected Fuel Types Attributable to the RFS Set 2 Rule Proposed Volumes (million gallons)[a]

Category	2026	2027
CNG/LNG from biogas[a]	716	743
Diesel/jet fuel from wood waste/MSW	0	0
Biodiesel from soybean oil	1,139	1,161
Biodiesel from canola oil	295	292
Biodiesel from FOG[b]	-25	-28
Biodiesel from corn oil	118	141
Renewable diesel from soybean oil	1,294	1,544
Renewable diesel from FOG	901	879
Renewable diesel from corn oil	483	448
Ethanol from corn	212	228

[a] Provided in ethanol-equivalent gallons. CNG = compressed natural gas; LNG = liquified natural gas

[b] FOG = Waste fats, oils, and greases.

In their BE, EPA indicated that if there is an increase in crop production, then there may be potential for an increase in land use change (Table 8) and subsequent habitat loss or degradation for ESA-listed species and critical habitat PBFs, subject to uncertainties in the causal chain. In addition, anticipated changes in agricultural practices could increase the quantities of fertilizer, pesticides, and sediment in habitat or waterways adjacent to land converted to produce these crops. Accordingly, EPA determined that if there is habitat loss or a change in water quality due to changes in crop production, then the proposed action could pose an effect on ESA-listed species that live in or near the impacted waterways, their habitats, and critical habitat PBFs. This led EPA to determine that the proposed action "may affect" ESA-listed species and designated critical habitats.

Table 8. From Table IV.A.2-2 of USEPA 2026a: Estimated Land Use Change Attributable to the Set 2 Final Rule

Million Acres	2026	2027
Corn - Direct	0.102	0.108
Soybean - Direct	1.789	2.176
Canola - Direct	0.373	0.421
Total Cropland – Indirect[a]	0.725	0.725
Total	2.990	3.431

[a]EPA's estimate of the indirect effect is primarily a function of the increase in the volume of fuel attributable to the final rule.

Uncertainties and Unknowns in the Causal Chain Between the Proposed Action and Effects of the Action

There are many economic, administrative, and legal hurdles in between the issuance of the Set 2 Rule and subsequent decisions made by farmers to grow additional crops, which may be influenced by market demands for biofuel production. In Appendix A of their BE, EPA demonstrated that any potential effect that may occur as a result of the RFS program occurs only through a multi-step causal chain (Figure 1) involving numerous third-parties, such as refiners, renewable fuel producers, consumers, distribution networks, grain silos/warehouses, and farmers, whose independent decisions influence crop production and land-changes. Many uncertainties on the impact of RFS on crop production arise from links in this causal chain, including the second (i.e., refiner decisions), third (i.e., consumption of renewable fuels), fourth (i.e., total production of renewable fuels in the U.S.), and fifth (i.e., production of crop-based feedstocks for renewable fuel production).

Link 2: Refiner decisions about the mix of biofuels and/or RNs needed to meet the RFS standards

To participate in the RFS program, renewable fuel producers must register with EPA and keep records demonstrating their product meets statutory requirements for renewable fuel – that it is produced from renewable biomass and used as transportation fuel in the U.S. (i.e., refiners purchase the biofuel to mix with fossil-based fuel). These statutory requirements *do not* include any tracking of crop origination below the renewable fuel producer as to the source of the renewable biomass (e.g., crops) that is used in the production of biofuels. Without site-specific data, EPA is unable to reasonably analyze any site-specific effects to ESA-listed species or designated critical habitats. In addition, neither the program itself nor the standards promulgated in this action require any action by or place any other requirements on any renewable fuel producer or farmer. The RFS standard does not mandate what farmers grow, how individual farmers make crop planting decisions, or how much of a crop to grow. Instead, these decisions are up to individual farmers and based on many market factors, unrelated to RFS standards, like crop prices, demand for crops, and local growing conditions. Their decisions can change from year to year depending on how market factors change over time.

In addition to refiner decisions, farmers make decisions about what crops to grow primarily based on projected grain and oilseed market prices, input prices, expected weather, crop rotation needs, and federal and state subsidies. Their decisions also depend on the land available to them (whether owned or leased) and its suitability for growing certain crops. Farmers do not grow particular crops for the purpose of meeting demand for renewable fuel or any other end use (e.g., earmarked for biofuels versus animal feed) nor do biofuel producers specify how much of the fuel they produce is attributable to the RFS program rather than what they would have produced in the absence of the RFS volume standards (*see* BE page 3). In fact, EPA provided evidence (*see Link 4: Total production of renewable fuel in the U.S.* below) that historical increases in ethanol consumption, in particular, were driven by factors other than RFS.

Link 3: Total consumption of renewable fuel in the U.S.

The EPA noted uncertainties in predicting exactly how many gallons of renewable fuel would be used for transportation in the U.S. in a given year due to various economic, administrative, and other factors that influence the calculation. RFS standards set by the EPA are based on *projected* volumes of gasoline and diesel consumption, which deviate to some degree from what actually occurs. While the discrepancy typically falls within the range of a few percentage points, it can be much higher, as occurred in 2020 due to the impacts of the COVID-19 pandemic on fuel markets. In addition, actual renewable fuel volumes used in a given year vary because RINs used to demonstrate compliance with the RFS program can be banked across years if an obligated party over-complies in any given year. Parties can use "carryover" RINs in subsequent years or carry deficits across years as long as they compensate for the loss in the next year. Many market factors beyond the RFS program affect the consumption of renewable fuel, including crude oil prices, renewable fuel production costs (which are affected by feedstock and power costs), tax subsidies, and demand for renewable fuels created by other federal and state programs (*see* BE page 18).

Link 4: Total production of renewable fuel in the U.S.

Crops used for biofuels (corn, soybeans, and canola) are grown for a variety of purposes in addition to renewable fuel, including food, animal feed, and various industrial and manufacturing processes. The proportions of each crop that are used in biofuel production fluctuate each year. Between 2016 and 2025, an average of about 32% of domestic corn production was used for fuel ethanol, while an average of about 36% of domestic soybean oil (representing about 19% of domestic soybean production) was used for biodiesel (*see* BE page 192).

In addition, imports and exports of renewable fuel influence domestic production volumes. Increased feedstock demands could be met by growing additional acres of corn, soybean, or canola, increasing their yields per acre, or by importing more of these feedstocks. However, renewable fuel producers could decrease their exports to meet any additional needs of domestic refiners without increasing acreage needed for growing feedstocks. In recent years, the primary fuel types that have been imported are biodiesel, renewable diesel, and ethanol, in total representing about 5% of domestic consumption.

Greater import volumes generally mean that there is less need for domestic production to meet overall biofuel demand, including the smaller RFS standards component. Exports of renewable fuel, in contrast, generally mean that domestic production is higher than what is needed to meet domestic consumption demand, of which RFS standards are a small component (*see* BE page 192). Over the last several years, some ethanol and smaller volumes of biodiesel (combined, 10% of domestic consumption) have been exported (*see* BE page 192).

EPA acknowledged that growth in corn ethanol production over time coincided with, and was not necessarily caused by, the increase in applicable standards under the RFS program. EPA identified four primary sources of evidence (*see* BE Attachment 3, page 2) supporting the conclusion that the increase in ethanol consumption was primarily driven by factors other than the RFS program. First, by the end of 2006, ethanol consumption had increased by about 80% relative to the 2000 level. However, the first regulatory requirements for RFS did not go into effect until 2007. Second, actual consumption of ethanol exceeded the requirements of the RFS program between 2007 and 2011, often by a wide margin. The fact that actual consumption exceeded the applicable standards suggests that the RFS program was neither the only nor the primary factor driving ethanol consumption. Third, RIN prices, the currency of the RFS program and the means through which refiners demonstrate compliance with RFS standards, were very low, a few pennies per RIN in most instances, until 2013. The fact that credit prices were extremely low suggests that the program requirements were not driving overall ethanol consumption levels over that period. Finally, ethanol production capacity in the early years of the RFS program far exceeded what would have been needed to meet RFS volume requirements. For example, the 2012 requirement under RFS was 7.5 billion gallons, while ethanol production capacity (i.e., the sum of capacity from operating plants and plants under construction) at the end of 2007 was 13.4 billion gallons. The volume of capacity was expanding during this time and RFS requirements were far below capacity, suggesting that investors were responding to future outlooks for ethanol demand that were based on factors beyond the RFS standards. Therefore, EPA concluded, and we agree, that factors other than RFS standards likely drove the expansion of ethanol production and consumption.

In 2025, the U.S. Department of Agriculture and the Export-Import Bank of the United States announced a new partnership that aims to boost exports of domestically-grown crops, including financial incentives, which could explain changes in exports that are unrelated to the RFS program (USDA and EXIM 2026). Even with these incentives, U.S. farmers reported growing less corn and more soybeans in 2025 than in 2026, and no reference specifically to RFS or any other reasoning was mentioned (USDANASS 2026).

Link 5: Production of crop-based feedstocks for renewable fuel production

RFS volume requirements are a small component of the overall production and consumption of corn, soybeans, and canola. For example, EPA concluded that only a small portion of ethanol production in the 2026–2027 timeframe can be attributable to the Set 2 Rule, and much of the increase in ethanol production in recent years can be attributed to multiple factors other than the RFS program (e.g., ethanol use as a replacement for methyl tertiary butyl ether in gasoline, other state and federal renewable fuel mandates, state and federal tax incentives, and improved ethanol blending economics driven by high oil prices and a shift to match blending to take advantage of ethanol's high-octane rating) (*see* BE page 35). In addition, EPA estimated that the RFS program in 2026–2027 may only be responsible for approximately 1-2% of ethanol consumption produced domestically, and this volume would correspond to about 1% of the land devoted to growing corn (*see* BE page 67).

For soybeans, EPA described the influence of diverse markets on the production of soybeans and specifically, soybean oil (*see* BE page 41). Overall production of U.S. soybeans remained relatively stable between 2015-2024, averaging 4,043 million bushels per year with a peak in 2020-2021 of 4,406 million acres. For the marketing year 2023-2024, approximately 57% of all soybeans were used for domestic crush (i.e., for oil and meal products) while the remaining 43% were exported. As demand for crush continued to increase, there was a subsequent decrease in exports (Bukowski and Swearingen 2025). Specifically, soybean oil is used for many products in addition to biofuels, including foods, cleaning products, bioplastics, and cosmetics (*see* BE page 42). Historically, soybean oil has accounted for less than half of the total value of crushed soybeans; oil was a byproduct of meal production, and biofuels provided a market for this excess oil. Soybean meal used for livestock feed accounted for more than half of the total value (*see* BE page 43). Of the soybean oil produced in the U.S. in marketing year 2022-2023, approximately 46% was used in biomass-based diesel (biodiesel and renewable diesel) production (Ramsey 2024) and potentially connected to the RFS program. Most biodiesel and renewable diesel producers purchase soybean oil from soybean crushing facilities, so biofuels are not the sole purpose of this soybean oil production (*see* BE page 43).

Similar to soybeans, canola seed is processed through a crushing facility to produce both oil and meal. The meal is used primarily for animal feed. The oil produced is used for food markets and in the production of biofuel. EPA approved the use of canola-based biodiesel to accrue RINs under RFS in 2022. Since 2000, domestic production of canola oil has increased by approximately 300%, from approximately 750 million pounds in 2000-2001 to nearly 2 billion pounds in 2023-2024. During this same period, imports of canola oil have increased much more substantially. Imported canola oil currently represents about 80% of the total supply of canola oil to the U.S. (*see* BE page 45). Most canola seed used in the U.S. (85%) is grown domestically, but the limited quantities of canola oil produced in the U.S. are still typically produced from imported canola seed (*see* BE page 46).

The majority of corn, soybean, and canola crops are used in non-biofuel markets. According to EPA, "future increases in total corn production may be driven by demand for corn used for non-ethanol purposes." Future increases in the "use of corn to produce ethanol is projected to be a considerably smaller portion of the total increase in corn production" (*see* BE page 66). The small RFS volume requirements could be met by increasing yields on existing fields, decreasing exports of existing crops, or shifting biofuels crops from other uses (e.g., animal feed). Both corn and soybean yields per acre have increased dramatically over recent decades. Between 1996 and 2017, the U.S. average corn yield increased 42 percent, from 130 bushels an acre in 1996 to 185 bushels an acre in 2017 (Effland 2021). Between 2002 and 2022, U.S. soybean yields rose from an average of 38 bushels per acre to more than 50 bushels per acre (Vaiknoras 2024). In both cases, the adoption of genetically engineered seed, the growing use of precision agricultural technologies, and increased application of fertilizer and pesticides have led to higher yields. As yields increase, the land needed to meet increased demand, including for the RFS volume requirements, may remain the same or even decrease. Accordingly, EPA cannot predict with any certainty or likelihood that new cropland would be required to meet RFS Set 2 volume requirements.

EPA's Delineation of the Action Area

During consultation, an "action area" is developed that delineates "the area affected directly or indirectly by the Federal action and not merely the immediate area involved in the action." 50 C.F.R, § 402.02. In their BE, EPA determined that any potential effects of the action on ESA-listed and proposed species and designated and proposed critical habitats would be due to speculated changes in cropland conversion in response to the RFS Set 2 Rule and subsequent water quality effects. As we describe below, agricultural practices that occur on biofuel crops, that would occur regardless of whether the RFS program is implemented, are part of the environmental baseline (i.e., not part of the effects of this action), but increased pesticide, fertilizer, or water use resulting from the RFS program to increase yields of existing croplands would be included as potential effects of the proposed action.

EPA delineated the "area of potential land use change" based on where corn, soybean, and canola (i.e., predominant crops used for renewable fuels in the U.S) are currently grown and where EPA speculated additional areas could be converted to these crops in response to the RFS Set 2 Rule. To do this, EPA identified areas used to grow biofuel crops in 2020 by extracting corn, soybean, and canola croplands from the 2020 Cropland Data Layer (CDL, US Department of Agriculture, National Agricultural Statistics Service). EPA applied a 15-acre minimum mapping unit filter to avoid misclassification errors in the CDL and remove small-scale farms unlikely to be affected by the RFS Set 2 Rule. EPA then expanded the area using a conservative 5-mile buffer to capture where additional acres of corn, soybean, and canola might be grown in the future because the soil, water, and other climate conditions are likely similar, and infrastructure for planting, fertilizing, harvesting, storing, and transporting crops are already available, reducing production and transportation costs. EPA considered the resulting map the "area of potential land use change" (Figure 2).

To confirm all relevant land cover was included in the "area of potential land use change", EPA incorporated findings from Lark et al. (2020) showing that newly cultivated cropland predominately transitions into corn, soybeans, or wheat. Wheat is one of the most common crops to be replaced by corn or soybeans. EPA demonstrated that the area of potential land use change contained over 80% of the wheat land cover from the 2020 CDL, meaning it included all areas that they expect may be converted from wheat to corn, soybeans, or canola in the area of potential land use change. EPA also validated the area of potential land use change by comparing the 2020 CDL with the newly released 2023 CDL, prior to finalizing the BE, and found no significant differences in the footprint of these crops (i.e., corn, soybean, canola) between the two CDL datasets.

Because runoff from agricultural lands can transport excess nutrients (e.g., nitrogen and phosphorus), sediment, and pesticides (e.g., herbicides, insecticides, fungicides) into surrounding waterbodies and contribute to water quality impairments in streams, rivers, lakes, and groundwater, EPA expanded the "area of potential land use change" to capture downstream regions that could be affected by agricultural nonpoint source pollution. Using National Hydrography Dataset catchment and flowline data along with ArcGIS's *tracedownstream* tools, EPA modeled flow paths based on slope, elevation, stream order, and flow velocity. EPA used this area, shown in Figure 3, as their action area and the basis for their "may affect" determination by identifying ESA-listed species and critical habitats that overlapped the area.

Figure 2. From IV.B.3-2 of EPA 2026. Geographical Region[4] Where Corn, Soybean, and Canola May Be Grown to Meet Biofuel Volumes as Established by the Set 2 Rule Covering the Years 2026–2027.

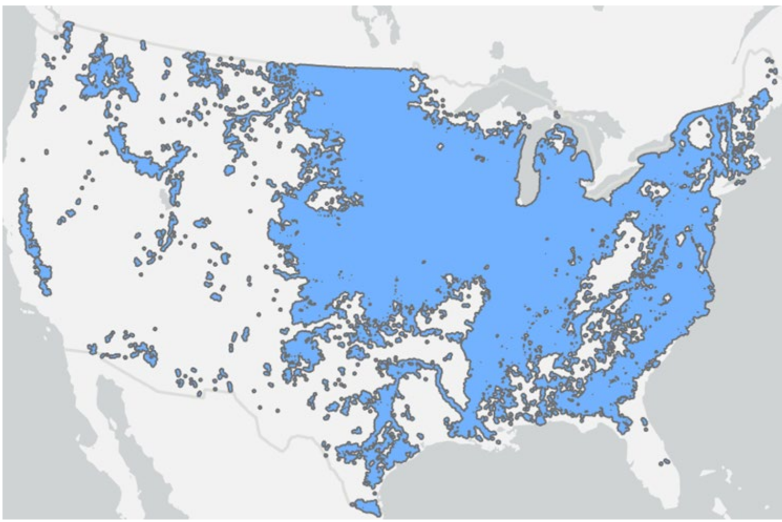


Figure 3. From IV.B.4-1 of EPA 2026. EPA's Mapped Action Area for the RFS Set 2 Rule.

Uncertainties and Probable Overestimations in Defining the Action Area

As described in their BE, EPA's "action area *may encompass* all locations in the U.S. where feedstocks used for renewable fuel are produced, transported, and used to produce biofuel that is consumed domestically. This *potentially* includes agricultural lands used for crop-based feedstocks as well as agricultural lands where crops used for non-biofuel

[4] This region was identified by extracting corn, soybean, and canola croplands from the 2020 USDA Cropland Data Layer, applying a 15-acre minimum mapping unit filter, and applying a five-mile buffer.

purposes *might be grown* after being displaced from their current uses by the demand for biofuel production. It *could further include* lands used for non-crop-based feedstocks such as landfills, agricultural digesters, waste treatment plants, restaurants, and other facilities where biogas and waste oils, fats, and greases are collected and processed.") (emphasis added) (*see* BE page 23).

The CDLs used to create the action area represent the best available scientific and commercial data and may contain some classification errors or outdated information, especially for small patches or rapidly changing landscapes. The overall accuracy for CDL cropland classification is around 90% for corn (USDANASS, 2025), which means that 10% of land identified as corn in the data is a different land use and was erroneously identified as corn. The 10% erroneously identified as corn could be non-cropland that is suitable for conversion to a biofuel crop, non-cropland that is not suitable for agricultural conversion, or cropland that is not used for biofuels (e.g., wheat). EPA addressed some of these errors by filtering out small or erroneous fields using a 15-acre minimum mapping unit. There could still be mis-classified data in the CDL, suggesting an over-estimate of acres potentially convertible to biofuels under RFS.

In addition, EPA applied a 5-mile buffer around existing corn, soybean, and canola fields to account for potential new cropland. In general, land converted to new cropland would likely be close to existing fields to maximize operations of the farm (e.g., use of farm machinery, applying fertilizers and pesticides, provide irrigation if necessary; Fogg 2014). In some cases, the economic cost of having remote fields several miles away is too high, especially for small fields, and the cost and time spent moving large machinery outweighs the potential yield of the crop. Thus, we expect the 5-mile buffer is likely overly conservative, as we expect most new cropland will be closer to existing fields to provide economic benefit to the farmer.

EPA then expanded the area of potential land use change to create their final action area by adding downstream regions that could potentially be affected by agricultural nonpoint source pollution. Their action area included existing land used for agricultural production, and therefore, captured the potential impacts of intensification (*see* BE page 28; e.g., where croplands that are already part of the baseline could potentially be used to increase yields of these particular crops). Intensification as a result of RFS could lead to potential increased water, pesticide, and fertilizer use, which would be considered part of the effects of the action. While EPA's process for adding this downstream area is likely reasonable based on their modeling exercises for nutrient and pesticide runoff, the downstream expansion was based on the already exaggerated area of potential land use change that included a 5-mile buffer, thus compounding the conservatism in EPA's action area. In sum, agricultural practices that occur on biofuel crops regardless of the RFS program are part of the environmental baseline and should not be considered part of this action. Intensification, which could include increased pesticide, fertilizer, or water use, may result from the RFS program specifically on corn, soybeans, or canola and should be included as potential effects of the proposed action.

Within their action area, EPA provided an example for the Salt Creek tiger beetle critical habitat. They noted that even though an area was classified as available for conversion, they "cannot determine with reasonable certainty that agricultural growth attributable to the Set 2 Rule would occur" (*see* BE page 186) because the required saline environment may not be favorable for agriculture, even though it was included in their action area. Further, because many "other factors, beyond the RFS program, influence biofuel production and land use change, it is possible that the RFS Set 2 Rule alone won't contribute to any future land use or water quality changes in or around Lincoln, Nebraska, or indeed anywhere at all" (*see* BE page 186).

EPA's Modeling and Effects Analysis

EPA and the Service expect that any potential effects of the action on ESA-listed species and designated critical habitats would be due to changes in crop production to meet the RFS Set 2 Rule volumes. Potential effects include habitat loss due to land conversion and impacts on water quality from crop production.

To assess potential effects to ESA-listed species and designated critical habitats, EPA used a four-step process which included: 1) estimating the potential maximum number of acres of non-cropland that could be converted to biofuel cropland due to increases in domestic biofuel production that are attributable to the RFS Set 2 Rule, 2) identifying potential locations of acres within the action area that could be impacted due to increases in biofuel production attributable to the RFS Set 2 Rule, 3) assessing potential impacts on ESA-listed species and designated critical habitats from land use changes based on locations within the action area that were identified in step 2, and 4) assessing potential impacts on ESA-listed species and designated critical habitats from changes in water quality. Below, we summarize each step, list uncertainties identified from each step, and describe how those uncertainties affect our analysis of "effects of the action" on ESA-listed species and critical habitats.[5]

Step 1 - Estimation of Land Conversion for Biofuel Crops

For crop-based feedstocks, EPA used a scenario that all new biofuel volume requirements (Table 9) will be met by converting non-agricultural lands to biofuel croplands (2.937 million acres), in addition to 0.725 million acres that would be converted for displaced non-biofuel crops. In all, EPA predicted that 3.698 million acres of non-agricultural land would be converted to cropland to meet the RFS Set 2 volume requirements for 2026 and 2027. EPA then assessed the direct effects of biofuel production on planting and total cropland for (1) corn for ethanol, (2) soybeans for biodiesel, and (3) canola for biodiesel.

[5] Under the ESA implementing regulations, "effects of the action" are defined as follows: "Effects of the action refers to the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action, that will be added to the environmental baseline. The environmental baseline includes the past and present impacts of all Federal, State, or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early section 7 consultation, and the impact of State or private actions which are contemporaneous with the consultation in process. Indirect effects are those that are caused by the proposed action and are later in time, but still are reasonably certain to occur. Interrelated actions are those that are part of a larger action and depend on the larger action for their justification. Interdependent actions are those that have no independent utility apart from the action under consideration." 50 C.F.R. § 402.02 (2018).

Table 9. From ES-1 USEPA 2026a: Potential Acreage Impacts for All Crops in the U.S. Due to Increases in Corn Ethanol, Soybean Biodiesel, and Canola Biodiesel That Can Be Attributed to the EPA's Set 2 Rule.

	Volume Increase in RFS Set Rule (billion gallons)		**Potential Acreage Increase All Crops (million acres)**	
	2026	2027	2026	2027
Corn ethanol	0.212	0.228	0.094	0.101
Soybean biodiesel	2.433	2.705	2.335	2.596
Canola biodiesel	0.911	0.908	0.278	0.276

1) Corn Ethanol

EPA used estimates of the effect of corn ethanol production on corn acreage and cropland from Li et al. (2019), which analyzed the direct impact of corn land use and total cropland based on the proximity to an ethanol plant. For the Set 2 Rule, EPA updated the methodology from the Set 1 Rule using more recent data (2003–2023) through a new analysis (Khanna, 2025). Years with more recent data (after 2019) indicate that ethanol capacity (i.e., the production capacity of ethanol plants) may be diverging as an indicator for ethanol production and imply that crop acreage was more affected by the proximity to ethanol plants in earlier years. Between 2003 and 2017, estimates of average acres needed per unit of ethanol in the regressions from Khanna (2025) converge. EPA believed this data suggested an increase in corn cropland was possible with the increase in volumes attributable to the Set 2 Rule (*see* BE pages 55-56).

Using factors updated after Khanna's analysis, EPA estimated the acreage effects of ethanol volumes attributable to the Set 2 Rule at 0.363 million acres per billion gallons for corn acres and 0.442 million acres per billion gallons for total cropland effect. EPA's total estimated acreage impact from corn ethanol under RFS Set 2 for 2027 is 101,000 acres of new cropland; because estimated values for 2027 were higher than those for 2026, EPA used 2027 values in their modeling.

2) Soybean Biodiesel

Like corn ethanol, EPA updated methodology from the Set 1 Rule by adapting what was first developed in Li et al. (2019) to estimate the impact of soybean biodiesel production on soybean planting and total cropland with data from 2011-2020. Unlike corn, soybeans must first be processed at a crushing facility prior to being sent to soybean biodiesel production facilities; thus, modifications were made to EPA's methodology to account for this process. As stated in their BE, EPA expected that any increase in soybean planting would occur closer to soybean crushing facilities rather than soybean biodiesel production facilities. To assess the impact of soybean biodiesel production on land use near soybean crushing facilities, EPA acquired proprietary data from CrushTraders at the facility level for soybean crushing facilities. Additionally, EPA analyzed the impact of increasing soybean prices on cropland (Miao et al., 2025). Miao et al. (2025) estimated an increase of 1.93 million acres of soybeans and 0.96 million acres of total cropland for each billion gallons of soybean biodiesel production in 2026–2027. EPA's total estimated acreage impact from soybean biodiesel under RFS Set 2 for 2027 is

2,596,000 acres of new cropland; because estimated values for 2027 were higher than for 2026, EPA used 2027 values in their modeling.

3) Canola Biodiesel

The heavy reliance on imported canola products would likely require EPA to develop new analytical techniques to reliably project the impact of increased canola biofuel on land use change. In the absence of a new methodology to project the impact of canola biodiesel on land use in the U.S. for the BE, EPA relied on the same methodology as in the Set 1 BE, which included using the Forest and Agricultural Sector Optimization Model (FASOM) to project land use change attributable to an increase in demand for canola biodiesel. EPA scaled impacts of this modeling based on the volume of canola biodiesel attributable to the Set 2 Rule relative to the increase in demand for canola biodiesel in the original FASOM modeling. Using the FASOM-derived factor of 305 acres per million gallons, EPA estimated that canola volumes attributable to the Set 2 Rule would result in approximately 278,000 acres of land use change in 2026 and 276,000 acres in 2027.

Uncertainties in Feedstock Land Conversion Estimations

We consider the process used to be the best available for assessing potential effects of the 2026–2027 RFS Set 2 Rule on future crop production in the U.S. in response to the rule, but we also explain why the uncertainties and assumptions that EPA relied on led to a worst-case scenario that is not likely to occur.

EPA estimated land conversion on the totality of volume requirements for 2026–2027. Specifically, EPA estimated that all new volume requirements would be met by adding new cropland in the area of potential land use change. EPA stated throughout the BE why this is unlikely to occur (*see* BE pages 5, 50, 67, 80, 118, and 186), and explained that they used this scenario in the probabilistic approach to determine potential impacts to listed species and critical habitats. Specifically, EPA stated "the impacts presented in this BE are somewhat hypothetical and are based on potential scenarios, which often conservatively compensate for the absence of specific land conversion and associated water quality impact data" (*see* BE page 3). EPA's Biofuels and the Environment: Third Triennial Report to Congress (RtC3; USEPA 2025b) provides historical land conversion data that does not support the scenario EPA used.

In their RtC3, EPA noted that after decades of decline, increases in cultivated cropland were recorded following the 2007 to 2012 period. They reported that between zero and 3.5 ± 1.0 million acres of corn and between zero and 1.9 ± 0.9 million acres of cropland expansion may have been attributable to the RFS program (*see* USEPA 2025b, page IS-15). EPA reiterated that "methods to explicitly link the RFS Program with individual parcels of land do not currently exist" (*see* USEPA 2025b, page IS-20) and "[t]he range of possible impacts from the RFS Program likely spanned from no effect to a negative effect on terrestrial biodiversity historically (2008 to 2016)" (*see* USEPA 2025b, IS-12-2), but they did not assess effects to most ESA-listed species or critical habitats.

Despite increases from 2002 to 2017, the extent of cultivated crop acreage for this period was below historical levels. EPA found that most of the 31.7 million-acre increase in corn and soybean acreage between 2002 and 2017 was converted from other cultivated cropland (~18 million acres, 56%), followed by non-cultivated croplands (6.7 million acres, 20%), pastureland (4.2 million acres, 13%), and lands in the Conservation Reserve

Program (CRP: 3.6 million acres, 11%). Importantly, 56% of new corn and soybean lands cultivated between 2002 and 2017 simply replaced other crops and did not result in non-cropland conversion. Non-cultivated cropland includes permanent haylands (production of forage crops machine harvested annually; e.g., grasses and legumes) and horticultural cropland (intensively managed crops; e.g., fruit and nut trees, berries, and vineyards). Pastureland is managed primarily for introduced forage plants for livestock grazing with management consisting of cultural treatments: fertilization, weed control, reseeding or renovation, and control of grazing. Thus, the 33% converted from non-cultivated lands and pasturelands were previously in active management. CRP lands are environmentally sensitive land (e.g., degraded or sensitive to runoff and erosion) that are temporarily removed from agricultural production (10-15 years on average) and planted with particular species to improve environmental health and quality. So, while EPA estimated land conversion on the totality of volume requirements for 2026–2027, the data provided by EPA in RtC3 does not support this scenario because between 2002-2017, most corn and soybean expansion resulted in conversion of existing crops (56%) or other actively managed non-cropland (44%) to corn or soy; lands from "All Other" categories, which included water, forested, urban, rural, and federal lands, were not converted to corn and soybeans according to the results presented in the RtC3. In fact, some cultivated lands were converted to "All Other" classes during this time (*see* Figure 5.4 in USEPA 2025b).

EPA mentioned that land use changes estimated to be attributable to the Set 2 Rule from each of the three crop-based feedstocks would occur at a "small scale," relative to the very large geographical area that represents land available for conversion (*see* BE page 185). EPA expects that "market inertia would likely drive the continued use of ethanol at nearly current levels absent the RFS program, at least in the short term" and renewable fuel volumes being finalized for 2026–2027 "could likely be met with little or no additional ethanol production (and thus little to no conversion to cropland resulting from additional ethanol production) relative to 2024 levels" (*see* BE pages 48-49).

There is little information on biodiesel and renewable diesel compared with ethanol, and very few retrospective analyses on the relationship between the RFS program and biodiesel and renewable diesel production. Therefore, EPA did not provide a quantitative estimate of the amount of biodiesel and land attributable to the RFS program in the RtC3. In their BE, EPA described that soybeans and soybean oil are used in many different markets, each of which could influence domestic soybean production. EPA indicated that the primary uses for soybeans in the U.S. are exports (for similar uses abroad), crushing to produce soybean oil (used in a wide variety of domestic markets, including fuel, food, and industrial), and soybean meal (for domestic use as animal feed). Soybeans used for seed, feed, and other uses have remained fairly consistent, with small decreases between 2000-2001 and 2023-2024 (*see* BE page 41). EPA also explained that most biodiesel and renewable diesel producers purchase soybean oil from soybean crushing facilities, and existing domestic "soybean crushing facilities are already operating at or near capacity", and they expect there would be little to no near-term increase in soybean demand from crushing facilities. Any changes to soybean biodiesel would require increases in soybean crushing capacity (*see* BE pages 43-44), not increases in land cultivated for soybeans.

With respect to canola, a pathway for canola oil use in diesel was approved in 2022, after which biofuel production may be a primary driver of demand for canola oil in the U.S.

However, EPA states in the BE that much of the increase appears to have been met with increased imports rather than increased canola production in the U.S. (*see* BE page 47).

Furthermore, based on both National Agricultural Statistics Service and National Resource Inventory data from 2000 to present (USEPA 2025b), there has been a continuous decline in the types of crops produced in the U.S., with a higher proportion of cultivated lands moving from other crops to corn and soybean production, thus strengthening the possibility that corn and soybeans are simply replacing other crops rather than being grown on lands converted from non-cropland. As described further in the RtC3 (Chapter 5), EPA found that almost the same number of acres of corn and soy was converted to other crops (including CRP lands, haylands, or other cultivated crops) as the reverse (USEPA 2025b).

Similarly, overall cropland acreage in the U.S. has been decreasing noticeably since 2014 (Irwin 2025). Acres planted with corn and soy increased between 2014 and 2025 by 4.7 million acres and acres planted with wheat decreased by 11.8 million acres, but combined, all three crops show a net decrease of 7 million acres in this time. Preliminary data for the 2026 growing season suggested that since 2025, corn acres would decrease by 3% and soybean acres would increase by 4%. There is no indication that these changes are related to any single market factor (USDANASS 2026).

Steps 2 & 3 – Identification of potential locations of acres impacted due to increases in biofuel production & assessment of potential impacts on ESA-listed species and designated critical habitats

EPA stated they are unaware of modeling tools that can predict with any certainty the precise location of land conversions due to biofuel production that may be attributable to the Set 2 Rule (*see* BE page 72), so they used a probabilistic approach (i.e., random simulations) to identify potential scenarios of land conversion within the area of potential land use change and estimate overlap between potential crop changes and ESA-listed species ranges and designated critical habitats.

EPA first identified all potentially convertible lands within the area of potential land use change using NLCD land cover types that are converted to agriculture most often (i.e., grasslands, shrublands, pasture/hay, and emergent herbaceous wetlands as described in Lark et. al 2015). EPA used ArcGIS Pro and R to randomly simulate conversion of about 3.764 million acres of land in the area of potential land use change.[6] They ran simulations 500 times to generate an estimated probability that a given acre of land would be converted to growing additional corn and soybeans specifically for biofuel production (*see* BE page 4). In some cases, these land cover types (excluding herbaceous wetlands) represent retired croplands that have been planted to permanent vegetative cover through the CRP. It is common for farmers to convert CRP lands back to active cropland after the CRP term expires (10-15 years), suggesting that some CRP lands may be converted to agriculture for reasons outside of the proposed action.

The CRP includes general and continuous programs that apply to environmentally sensitive agricultural croplands. The general program requires the establishment of grasses and legumes or

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[6] EPA noted in their BE that the amount of land simulated to be converted (3.764 million acres) is from their draft calculations and differs from the land estimated to be converted in step 1 (3.69 million acres). They considered the draft numbers to be a reasonable and slightly conservative estimate (*see* BE page 4).

planting of trees on croplands at the field level. The continuous program focuses more on components of agricultural lands including riparian/field buffers, windbreaks, small plot tree establishment, pollinator habitat patches, and water areas for wildlife. Overall, acreage of CRP lands in the general and continuous programs have been declining in the U.S. since at least 2014. Approximately 6% of general CRP lands are converted to the grassland CRP because they meet the cover crop eligibility criteria (Irwin 2025). The grassland program focuses on protecting existing grassland, including rangeland and pastureland, and maintaining those areas for continued grazing, in addition to providing plant and animal biodiversity. Because of these programs, some CRP lands that have been used as rangelands are unlikely to be converted to biofuel crops.

According to the Economic Research Service (Bigelow et al. 2020), of the 8.1 million acres enrolled in CRP contracts that expired during 2013-2016, they were able to track 94% of them (7.6 million acres) for their report and identify post-expiration land use. Overall, 36% of expiring CRP land was subsequently reenrolled. Fifty-one percent of expiring CRP land was put into some type of crop production, including annual crops (36%), perennial specialty crops (7%), and perennial forage crops (7%). On land that transitioned to annual crop production, the most common crops were soybeans (21%), corn (16%), and wheat (16%). Annual crop production on lands converted from CRP lands back to active croplands was particularly high in many midwestern and neighboring states.

To determine the distribution of the 3.698 million acres of non-agricultural land that EPA's model predicted would be converted to meet the RFS Set 2 volume requirements (from Step 1), EPA considered the factors used to estimate the national-level acreage. Effects manifest either through biofuel production or through price. Effects from production were simulated to occur close to biorefineries (i.e., within 25 miles for corn from Li et al. (2019), within 50 miles for soybean from Miao et al. 2025). Effects of an increase in crop prices on cropland acreage are expected to be more widespread and not confined to the vicinity of refineries; an increase in corn price creates incentives to convert land from other uses to corn, both in the vicinity of ethanol plants and elsewhere. Therefore, EPA simulated the conversion of 3.698 million acres of available non-cropland to cropland randomly across the area of potential land use change. EPA then estimated the proportion of each ESA-listed species range and designated critical habitat that intersected the action area. They repeated the model 500 times for critical habitat scenarios and 100 times for species range scenarios to generate probability distributions that explain possible impacts from the randomized scenarios. EPA also ran parallel simulations that included a 2,600-foot buffer[7] around species ranges and critical habitats to account for offsite pesticide or nutrient drift and runoff from cropland conversions (*see* BE page 73). Because crop conversions *could* occur anywhere within EPA's area of potential land use change and effects can propagate through both production-driven and price-driven mechanisms, EPA suggested this probabilistic framework provides the only scientifically supportable way to assess potential overlap with ESA-listed species and critical habitats in the absence of spatially precise land use forecasts.

[7] EPA used a 2,600-foot buffer per their Revised Method for National Level Listed Species Biological Evaluations of Conventional Pesticides (USEPA 2020), which states: "The endpoint that results in the farthest distance from the treated field where any effect to the listed species or its Prey, Pollination, Habitat, and/or Dispersal (PPHD) may occur relative to a specific listed species"… "is capped at 2600 feet (the area limit of the AgDRIFT model)."

EPA calculated the percent area affected with and without the 2,600-foot buffer for species ranges and critical habitats; they further separated the calculation with the buffer into two subsets: (a) ((area of critical habitat + buffer impacted) / total area of critical habitat + buffer)*100, and (b) ((area of critical habitat+ buffer impacted)/ (total area of critical habitat))*100. EPA explained that the percent using approach (a) may be interpreted as meaning the percent area in and around critical habitat affected by conversion in and around critical habitat. The percent using approach (b) may be interpreted as meaning the percent area of critical habitat affected by conversion in and around critical habitat (*see* BE page 75). EPA's analysis of critical habitat without a buffer resulted in 205 species affected at least once across 500 simulations (model S1). Sixteen of these critical habitats may experience habitat loss through conversion, according to EPA's modeling of land conversion for the Set 2 Rule. Using a 2,600-foot buffer on critical habitat (models S2a and S2b), EPA found 220 critical habitats were affected by habitat loss across 500 simulations, some of which resulted in effects to 10% or more of the critical habitat. EPA's modeling of species' ranges resulted in 1,041 species affected during at least one simulation out of 100 with no buffer (model S3), and 1,052 species affected during at least one simulation out of 100 with a 2,600-foot buffer (*see* BE pages 76-77).

Uncertainties Related to Probabilistic Modeling

To be conservative, EPA suggested that any of the potentially convertible lands can be converted to biofuel crops directly from the proposed action (i.e., grassland converted to corn) or indirectly from the proposed action (i.e., wheat field converted to corn, and other convertible lands converted to wheat to make up the difference). However, many factors influence which parcels of land could be converted to croplands, and EPA makes clear that they "cannot identify with any specificity parcels of land that may be converted to cropland, or any changes in water quality that may result from such conversion, that could be the result of incremental demand for biofuels created solely by the RFS program" (*see* BE page 3). After acknowledging that geographic specificity was not available for their action, EPA "attempted to identify potential locations of land use changes" (*see* BE page 186) by estimating the *probability* that a given acre of land would be converted to growing additional corn and soybeans for the specific purpose of producing renewable fuel under the RFS program.

While we expect using probabilistic modeling (Li et al. 2019) to generate areas where land conversion could occur from the RFS program demonstrates the best available science, it is reliant on accurate and reasonable parameterization that is unavailable from EPA. It is important to note that Li et al. (2019) looked at ethanol production in its entirety and was not focused just on RFS contributions. EPA admits data limitations and acknowledges their updated analysis relies on quantifying the effects of ethanol plant capacity, rather than actual ethanol production on corn acreage (*see* BE page 53), thereby overestimating potential non-cropland converted to cropland. For example, according to U.S. Department of Energy, Alternative Fuels Data Center (2026) in 2023, ethanol production capacity was 18.1 billion gallons while actual ethanol production was 15.5 billion gallons. In choosing their modeling scenario (i.e., all biofuel increases will be met by converting non-cropland to cropland for corn, soybeans, and canola), EPA overestimated both the action area (*see* Uncertainties and Probable Overestimations in Defining the Action Area above) and the effects of the action. There is a large amount of uncertainty and conservatism built into the underlying data used in EPA's probabilistic model. The area of potential land use change is reflective of potential areas where any corn, soybean, and canola could be grown, and not specifically where they could be grown in response to changes in RFS volume requirements. As we described above (*see Uncertainties in Feedstock Land Conversion Estimations*), the scenario EPA used in quantifying acreage for conversion is not supported by the results presented in their RtC3. Additionally, if a field formerly planted with wheat (i.e., a non-biofuel crop) is replaced with corn (i.e., a biofuel crop), and wheat is then planted on a field converted from non-cropland, there is no data to determine if the non-cropland lost to wheat farming occurred solely due to displacement as a result of biofuel demands from the RFS program.

As part of their simulations, EPA added a 2,600-foot buffer to critical habitats and species' ranges when calculating overlaps with the area of potential land use change to identify effects of pesticide drift and runoff from lands converted for biofuel production. They only presented percentage overlaps for some species simulated and did not identify proportions of overlap attributed to critical habitat or species' range and proportion of overlap attributed to the buffer specifically. We expect that land converted in the 2,600-foot buffer, and not in the critical habitat or species' range directly, would only affect the species through runoff or spray drift. However, this distinction was not provided in EPA's BE. Because we expect the simulated acreage is overestimated and not likely to result from the proposed action, for the reasons discussed throughout this LOC, we assessed effects to ESA-listed species and critical habitats qualitatively.

Uncertainties Related to Listed Species Range and Designated Critical Habitat Units

Species range maps define the geographic areas where a species may occur. However, not all areas within the range are considered suitable habitat all of the time. Life history needs (e.g., resources for breeding, sheltering, foraging, and dispersal/migration) may be satisfied by a multitude of different habitats. In some cases (e.g., endemic species), a single habitat type (e.g., vernal pool, talus slope) may satisfy all life history needs of the species. In other cases, life history needs may indicate a broad range of necessary habitat types (e.g., riparian areas for foraging, upland areas for sheltering). In addition, some species' ranges and critical habitats include areas that satisfy habitat needs for a particular purpose (e.g., temporary dispersal) or during certain times of the year (e.g., migration or breeding). There may be other reasons that we expect either discountable exposure or insignificant effects, even if we assume that there is overlap between an action and the species' range or critical habitat, as indicated by EPA's assessment.

In Step 3, EPA identified that their action's potential effects (i.e., conversion of non-cropland to cropland and subsequent water quality effects) could overlap with listed species' ranges; however, an area of overlap identified by EPA's analysis would not necessarily indicate effects to the species are likely to occur directly or indirectly (e.g., through effects to habitat from conversion or water quality degradation), even if you assume that the map is an accurate representation of the action area. In addition, EPA did not differentiate in their modeling results between overlap from land conversion (i.e., the area of potential land use change) or overlap from water quality effects (i.e., buffers); for the subset of species that EPA shared overlap values, there is a single value that represents overlap with both areas of potential land use change (i.e., land conversion) and areas potentially exposed to water quality effects after conversion. EPA assumed that if an individual of a species is found in the overlapping area at the time of potential land conversion and/or water quality effects, then the species could be affected by the proposed action. There are uncertainties associated with these assumptions. For example, if individuals are only found in the overlapping area during certain times of year, then they may only be affected by habitat loss or decreases in water quality if the effects occur during the times of year when individuals are present (e.g., during migration or breeding) or linger for a time after the action.

The same is true for critical habitat designations. Some critical habitat PBFs are found disparately throughout critical habitat units. Therefore, even if EPA found overlap of potential land use change within a critical habitat unit, there is no indication that PBFs will necessarily be exposed to effects. For example, some areas of the fleshy-fruit gladecress critical habitat contain active agricultural fields (e.g., corn fields). The critical habitat PBFs were likely removed when the land was previously converted from natural glade habitat to active agriculture, unrelated to the RFS program (Alabama Field Office, pers. comm., 2026). Therefore, overlap of the fleshy-fruit gladecress critical habitat with the action area in this case does not necessarily mean that the proposed action is going to adversely affect critical habitat PBFs for the fleshy-fruit gladecress. We expect changes in land use within the fleshy-fruit gladecress critical habitat would only adversely modify critical habitat if areas that were natural glades were converted to active biofuel production; based on what we described above about expansion of biofuel production primarily affecting other pre-existing agricultural lands (*see Uncertainties in Feedstock Land Conversion Estimations*) and our expectation that EPA's overlap calculation is overly conservative (*see* <u>Uncertainties and Probable Overestimations in Defining the Action Area</u>), we expect that conversion of natural habitat within the fleshy-fruit gladecress's critical habitat from the RFS Set 2 Rule is extremely unlikely to occur. For areas of critical habitat that may be exposed to water quality degradation from agricultural land uses, we expect insignificant effects from the RFS Set 2 Rule because the proportion of water quality effects from agriculture grown or converted to biofuels specifically under RFS are immeasurable from those of agricultural land uses as a whole (*see Uncertainties From Water Quality Assessment Estimates*).

Some agricultural areas (i.e., existing croplands, non-cultivated croplands, pastureland, and CRP lands) provide habitat for ESA-listed species; for example, many species feed on (e.g., Gunnison sage-grouse; USFWS 2019a), grow on (e.g., Spring Creek bladderpod; USFWS 2006), or hibernate near (e.g., bog turtle; USFWS 2022a) active agricultural fields, including corn, soybeans, or canola. CRP lands that were converted back to cropland, especially those planted with grasses and legumes, may have provided foraging and dispersal opportunities for ESA-listed species, but likely did not have sufficient time between the changes in uses to grow into suitable sheltering or nesting habitat or develop functional PBFs of critical habitat.

Step 4 - Assess potential impacts on ESA-listed species and designated critical habitats from changes in water quality

In their BE, EPA identified changes in water quality that could occur after agricultural runoff from increased conversion to croplands as a result of the RFS program. Sediment, pesticides, and nutrients can be released in nearby waterbodies during crop production, including for biofuel crops. In addition, higher levels of fertilizers, herbicides, pesticides, and fungicides could be applied on existing croplands to increase yield (USEPA 2025b).

To estimate the impact on water quality attributable to the Set 2 Rule, EPA leveraged results from a new historical nutrient trends analysis to estimate the water quality impacts on a national scale from observed increases in cropland during the biofuel expansion period. EPA paired this new analysis with the results from Chen et al. (2021), who used the Soil and Water Assessment Tool (SWAT) performed for the RtC3. SWAT is a small watershed to river basin-scale model used that simulates the quality and quantity of surface and ground water and predicts the environmental impact of land use and land management practices, and environmental change. SWAT was used to estimate specific water quality impacts (e.g., nitrogen and phosphorus) from the time of increasing cropland expansion prior to 2021.

The SWAT results show that, as expected, fertilizer inputs and crop nitrogen fixation have increased due to expansion of livestock production and corn and soy cultivation. However, crop removal of nitrogen and phosphorous has largely kept pace with or exceeded those increases. Additionally, although nutrient pollution is a widespread stressor for surface waters, nutrient concentrations for the analyzed time period were relatively stable nationally, with either no significant trends or significant decreases in waters in poor condition. Finally, the regional trend analysis showed that the most common trend is declining nutrient and sediment export. Flow-normalized nutrient export remained relatively stable in the regions analyzed. These results show that despite an increase in agricultural production in recent years, there is not significant national degradation in water quality attributable to that production, which suggests water quality would change little, if at all, after potential land use changes from the Set 2 Rule.

None of the water quality analyses considered the impact of increased use of pesticides, and no equivalent study on pesticide concentrations exists. While nitrogen, phosphorus, and suspended solids are not perfect analogs to pesticides, they share some important similarities. Application rates for both fertilizers (i.e., nitrogen and phosphorus) and pesticides are expected to be related to the projected potential changes in cropland. For example, we expect that any new land planted with corn would be treated with fertilizers and pesticides at the average national rate for all corn acres. If the land converted to corn was previously non-cropland, we expect fertilizer and pesticide use to increase after corn planting compared to before conversion. If the land converted to corn was previously another crop (e.g., wheat), fertilizer and pesticide inputs may increase or remain similar, depending on what the inputs were under the previous agricultural practices. In the RtC3, EPA mentioned that more pesticides are typically used on corn than other crops, pasturelands, or hay (USEPA 2025b), but there is some uncertainty and variability based on region and other agricultural practices used. We estimate that pesticide increases in aquatic environments would be approximately equal to the increases in nitrogen and phosphorus projected in the Chen et al. (2021) study. The model results suggest that, even if the maximum projected acreage effects from the Set 2 Rule were to occur (i.e., 3.69 million acres converted for biofuels), water quality effects specifically from results of the Set 2 Rule will be small relative to total nutrient, sediment, and pesticide effects already happening at the mouth of the Mississippi and other large water bodies within the action area.

We note that the EPA has several programs and funding opportunities designed to improve water quality. EPA and the Service have completed consultation on several nationwide pesticide registrations, including five herbicide active ingredients that are commonly used on corn or soybeans in the U.S. (i.e., malathion, 2,4-D choline salt (formulations with and without glyphosate), simazine, and atrazine) and two insecticide active ingredients that are commonly used on soybeans and corn (i.e., methomyl, and carbaryl), which resulted in various label changes that incorporated conservation measures to reduce adverse effects to listed species and designated critical habitat and avoid jeopardy of species and adverse modifications to critical habitat. We expect that these efforts will lessen any potential water quality impacts of increased cropland attributable to the Set 2 Rule, if indeed such cropland increases occur. Additional pesticide consultations will be completed in the future with goals to reduce effects to ESA-listed species and critical habitats.

EPA used the best scientific and commercial data available for assessing water quality effects from land converted to biofuel cropland due to the RFS program. Their results show that potential magnitudes of exposures to nutrients, sediments, and pesticides from this potential land conversion is quite small and will likely occur within the bounds of variability absent the RFS Set 2 Rule.

Uncertainties From Water Quality Assessment Estimates

First, inputs to the SWAT model are uncertain because EPA was unable to provide site-specific conditions for inputs (e.g., fertilizers). Second, the SWAT modeling EPA used focused on the Missouri River basin, while the historic nutrient trends they used were nationwide. They chose the Missouri River basin (Figure VIII.A-1 in the BE) because it had some of the highest rates of grassland conversion to cropland from 2008–2016 when the domestic production of biofuels, particularly ethanol, expanded greatly (Lark et al., 2020). There is no assessment of whether the results from the Missouri River basin can be extrapolated to river basins with different ecological characteristics (e.g., the Mississippi or Sacramento). Third, the estimates assume that the RFS Set 2 Rule volume requirements are met solely by increases in land conversion to support domestic crop production, which as we have reiterated in this LOC, EPA considered was unlikely. Fourth, the proportion of ranges and critical habitats as potentially affected represent a scenario under which all modeled converted cropland is used to produce corn, but most of any actual increase in cropland is expected to be used for soybean production (*see* BE page 93).

Like other aspects of the action, spatial specificity and details on pesticide use are not available (e.g., pesticide compounds, application rates, and application methods). We expect ESA protections for some pesticide use to be included as pesticides go through national consultations with the Services during chemical registration and review, as required under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). Existing models used to estimate pesticide concentrations in aquatic habitats (e.g., SWAT, Pesticide in Water Calculator (PWC), or Wetland Plant Exposure Zone (WPEZ)) require information that is unavailable for the RFS program. Given uncertainties around which pesticides would be used, their concentrations, and their toxicities, we assumed that potential increases in pesticides could result from land conversions to biofuel crops used to meet RFS standards, if that occurs, and greater use of pesticides and fertilizers could lead to effects to ESA-listed species or their designated critical habitats. We acknowledge that pesticide use from activities that occur before conversion of any lands to biofuel crops because of the RFS Set 2 Rule may already cause changes to water quality as part of the baseline. Ultimately, contributions of fertilizer and pesticide use specifically from the RFS program are impossible to discern with the best scientific and commercial data available.

The Service Concurs with EPA's Determination that the RFS Set 2 Rule is Not Likely to Adversely Affect ESA-Listed Species or Designated Critical Habitats

In the previous letter of concurrence for the RFS Set 1 Rule, signed August 3, 2023 ("Set 1 LOC"), the Service concurred with EPA's conclusion that the proposed action was not likely to adversely affect any ESA-listed species or designated critical habitat because the Set 1 Rule would not result in any "effects of the action," as defined under the ESA's implementing regulations at 50 C.F.R. § 402.02 (2023),[8] and would therefore have "no effect." The Service explained that if a federal action will have "no effect" on ESA-listed species or designated critical habitats, then it follows that the species or critical habitats are also not likely to be adversely affected by the proposed action.

On June 20, 2025, in *Ctr. for Biological Diversity v. EPA*, 141 F.4th 153, 182 (D.C. Cir. 2025), the D.C. Circuit concluded that the Service's "no-effect" concurrence was arbitrary and capricious because it did not reasonably address the results of the forecasting models that EPA used to predict the locations where cropland conversion is most likely to occur. The Court remanded the Set 1 LOC without vacatur to EPA and to the Service for further proceedings consistent with the decision. *Id.* at 194. While we are continuing to develop a revised analysis for the Set 1 Rule on remand, for this consultation on the RFS Set 2 Rule, we simultaneously made every effort to address the Court's order by further engaging with the models and explaining whether the models can adequately support an aggregate estimate of the geographical impact of the Set 2 Rule.

Consistent with its analysis in the Set 1 LOC, the Service maintains that it is appropriate to exclude "indirect effects" of the action that are not otherwise "reasonably certain to occur," in accordance with the implementing regulations' definition of "effects of the action" at 50 C.F.R. § 402.02 and other applicable guidance.[9] In circumstances where the Service determines that there are no "effects of the action," as defined under 50 C.F.R. § 402.02, then the proper determination is that the proposed action will have "no effect" on ESA-listed species or designated critical habitat.

In requesting informal consultation on the Set 2 Rule, EPA determined that the proposed action "may affect," but is "not likely to adversely affect" listed species or designated critical habitat under the Service's jurisdiction, for the reasons discussed above. Given the specific facts and consultation history of this program, for purposes of this informal consultation, the Service will proceed under EPA's determination that the proposed action (i.e., the Set 2 Rule) "may affect"

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[8] 2023 version of the definition of "effects of the action" under 50 C.F.R. § 402.02: "Effects of the action are all consequences to listed species or critical habitat that are caused by the proposed action, including the consequences of other activities that are caused by the proposed action but that are not part of the action. A consequence is caused by the proposed action if it would not occur but for the proposed action and it is reasonably certain to occur. Effects of the action may occur later in time and may include consequences occurring outside the immediate area involved in the action."

9 *See also Me. Lobstermen's Ass'n v. Nat'l Marine Fisheries Serv.*, 70 F.4th 582, 598-600 (D.C. Cir. 2023) (explaining that ESA section 7(a)(2) requires analysis of "'likely' outcomes, not worst-case scenarios," and under the implementing regulations at 50 C.F.R. § 402.02, consequences of the action that are not reasonably certain to occur "must be disregarded in evaluating the agency action").

listed species or designated critical habitat.[10] If a Federal action agency makes a "may affect" determination, formal consultation is warranted, unless the federal agency finds, and the Service concurs in writing, that the action "may affect" but is "not likely to adversely affect" the ESA-listed species or designated critical habitat. 50 C.F.R. § 402.14(b)(1). According to the ESA Section 7 implementing guidance in the Handbook, a "not likely to adversely affect" determination is generally "the appropriate conclusion when effects on listed species are expected to be discountable, insignificant, or completely beneficial." The Handbook also states the following:

> Beneficial effects are contemporaneous positive effects without any adverse effects to the species. Insignificant effects relate to the size of the impact and should never reach the scale where take occurs. Discountable effects are those extremely unlikely to occur. Based on best judgment, a person would not: (1) be able to meaningfully measure, detect, or evaluate insignificant effects; or (2) expect discountable effects to occur. (Handbook at xv-xvi).

To determine whether the proposed action (i.e., the RFS Set 2 Rule), is "likely to adversely affect" listed species or designated critical habitat, we must determine the "effects of the action." Under the current regulations at 50 C.F.R. § 402.02, "effects of the action" are defined as follows:

> Effects of the action refers to the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action, that will be added to the environmental baseline.... Indirect effects are those that are caused by the proposed action and are later in time, but still are reasonably certain to occur. Interrelated actions are those that are part of a larger action and depend on the larger action for their justification. Interdependent actions are those that have no independent utility apart from the action under consideration.[11]

First, we determined whether finalizing the RFS Set 2 Rule would cause any "direct effects" to listed species or designated critical habitats. The direct effect of EPA finalizing the RFS Set 2 rulemaking is the RFS program placing an obligation on producers and importers of gasoline and diesel (i.e., refiners) to utilize certain amounts of renewable fuel to replace fossil-based transportation fuels. The obligation is presented as a percentage standard that each refiner multiplies by its gasoline and diesel production and importation to determine the volume of

[10] The ESA Section 7 Handbook defines "may affect" as: "The appropriate conclusion when a proposed action may pose **any** effects on listed species or designated critical habitat." U.S. Fish and Wildlife Service and National Marine Fisheries Service, Final Endangered Species Act Consultation Handbook, xvi (1998) (hereinafter, "the ESA Section 7 Handbook" or "Handbook") (emphasis original).

[11] On March 30, 2026, in *Center for Biological Diversity v. Burgum*, No. 24-cv-04651 (N.D. Cal.), the U.S. District Court for the Northern District of California vacated aspects of four provisions from the 50 CFR part 402 regulations governing interagency consultation under section 7 of the Endangered Species Act and reinstated the provisions that were previously in effect, including the definition of "effects of the action." The 2018 version of the definition is now the operative definition. This 2018 reinstated definition includes the second sentence of the definition of "effects of the action." That sentence provided the definition of "environmental baseline" in effect as of 2018. In the 2019 rule amending the 50 CFR part 402 regulations, the Services established "environmental baseline" as a stand alone definition. 84 Fed. Reg. 44976, 45016 (August 27, 2019). In the 2024 rule, the Services made minor revisions to the "environmental baseline" definition. 89 Fed. Reg. 24268, 24298 (April 5, 2024). The Court's ruling did not touch upon that definition of "environmental baseline," and it therefore remains valid. The definition is also fully consistent with the definition of "effects of the action" from 2018.

renewable fuel for which it is responsible. This is purely an administrative requirement that the refiners must meet. Because there are no obligations directed at renewable fuel producers or other individual parties (e.g., farmers, grain mill operators) that grow or provide renewable fuel feedstocks (e.g., corn, soybean, canola), there are no direct effects to ESA-listed species or designated critical habitats from the proposed action. We also considered whether there were any "interrelated" or "interdependent" actions, as defined by the regulations and explained further in the Handbook, but we determined that the potential effects of the action would not fall into either of these particular categories. *See* Handbook at 4-26—4-28.[12]

Next, we determined whether finalizing the RFS Set 2 Rule would cause any "indirect effects" to listed species or designated critical habitats. As defined by regulation, "indirect effects" must be "caused by the proposed action," "later in time," and "reasonably certain to occur." *Id.* Given that there are no direct effects to listed species or designated critical habitats from the proposed action, any potential effects caused by the Set 2 Rule would be later in time and, therefore, considered "indirect effects." As described above in this LOC, indirect effects from the proposed action could occur if land is converted from non-cropland or other cropland to biofuel cropland (i.e., corn, soybeans, or canola) as a result of the RFS Set 2 Rule volume requirements. An increase in crop production could lead to habitat loss and increased use of pesticides, fertilizers, and sediment in terrestrial areas and waterways near converted lands. However, EPA suggested, and we agree, that crop production and non-cropland conversion may not occur from the proposed action at all. We conclude that EPA's estimates are very conservative and consequently represent an extremely unlikely, worst-case scenario (*see Uncertainties in Feedstock Land Conversion Estimations* above). We considered effects from pre-existing agriculture (e.g., cultivation, prior land conversion, and water quality degradation) to be part of the environmental baseline and not part of the effects of this proposed action.

However, as explained, "indirect effects" must also be "reasonably certain to occur." In the preamble to the 1986 final rule, the Services explained that the phrase "reasonably certain to occur" requires there to be "more than a mere possibility that the action may proceed" but "does not mean that there is a guarantee that an action will occur." 51 Fed. Reg. 19926, 19933 (June 3, 1986). The Handbook echoes this statement when describing the scope of activities that are "reasonably certain to occur," explaining that the phrase "does not require a guarantee the action will occur." Handbook at 4-32. The ESA Section 7 regulations included the phrase "reasonably certain to occur" to implement the statutory term "likely," used in ESA Section 7(a)(2), which requires Federal action agencies to consult with the Services to ensure that their actions are not "likely" to result in jeopardy to listed species or result in the destruction or adverse modification of designated critical habitat.[13] 16 U.S.C. § 1536(a)(2). According to the guidance implementing the regulations, the Handbook further states that federal activities with indirect effects are

[12] Although we did not identify any particular "interrelated" or "interdependent" actions, all potential effects of the action were included in our analysis of "indirect effects," as discussed in further detail below. Regardless of the categorization of the type of effect, this LOC identifies and assesses all potential effects of the action under 50 C.F.R. § 402.02.

[13] *See e.g., Me. Lobstermen's Ass'n v. Nat'l Marine Fisheries Serv.*, 70 F.4th 582, 595-96 (D.C. Cir. 2023) (explaining that Congress added "likely" to ESA Section 7(a)(2) to avoid the veto of Federal actions where the "risk of jeopardy is not 'likely,' but speculative"); *id.* at 598-600 (explaining that ESA section 7(a)(2) requires analysis of "'likely' outcomes, not worst-case scenarios," and thus, when analyzing "effects of the action" under 402.02, consequences of the action that are not reasonably certain to occur "must be disregarded in evaluating the agency action").

"reasonably certain to occur," "as evidenced by appropriations, work plans, permits issued, or budgeting; they follow a pattern of activity undertaken by the agency in the action area; or they are a logical extension of the proposed action." Handbook at 4-29. The Handbook also notes that non-Federal activities with indirect effects that are "reasonably certain to occur" "can also be predicted, particularly for ongoing projects that have a past pattern of use that is anticipated to continue." *Id.* In describing "reasonably certain to occur" within another context, the Handbook explains that "the Services should consider the economic, administrative, and legal hurdles remaining before the action proceeds" when assessing whether an action is "reasonably certain to occur." *Id.*

Following the Handbook's interpretation of "reasonably certain to occur," we have concluded that the potential consequences of the Set 2 Rule do not meet the "reasonably certain to occur" standard for "indirect effects," as defined by 50 C.F.R. 402.02. First, in its BE, EPA emphasized that potential environmental changes (e.g., land conversion and water quality effects) described in the analysis may not occur at all (*see* BE pages 5, 50, 67, 80, 118, and 186) and therefore, are *not reasonably certain to occur*.[14] Although the EPA acknowledged they "used conservative assumptions in their projection of the amount of land use change potentially attributable to the Set 2 Rule" and their consistent use of conservative assumptions in the many steps of their analysis "compound on each other to likely result in an over-projection of land use change potentially attributable to the Set 2 Rule" (*see* BE page 185). For example, EPA states clearly in link 2 of the causal chain (Figure 1) that RFS does not obligate individual parties to produce or use any amount or type of renewable fuel; these entities respond to the market, which is driven by many factors unrelated to the RFS Set 2 Rule (e.g., crude oil prices, production costs, tax subsidies, local growing conditions). RFS does not mandate what is grown, where it is grown, or in what amount; tracking of this information and connecting changes specifically from the RFS program to ESA-listed species and critical habitat is impossible with the best scientific and commercial data available. EPA also described that an increase in renewable fuel demand to meet RFS volume requirements may not lead to increases in land converted for agriculture (link 4); instead, increased yields from existing fields (*see* BE page 43), increased imports, decreased exports, and diverting feedstocks from food or feed markets would influence whether any land is converted to biofuel production and how much, but " that the RFS Set 2 Rule alone will not contribute to any future land use or water quality changes in or around Lincoln, Nebraska, or indeed anywhere at all" (*see* BE page 186).

The Set 2 Rule is not reasonably certain to result in increases in land converted for agriculture, and any potential increase in land converted for agriculture during 2026–2027 would likely be caused by factors other than the Set 2 Rule. Furthermore, corn, soybeans, and canola have many uses in addition to biofuels (link 5), and their primary uses are not biofuels. RFS volumes are a small component (e.g.; 1-2% for corn, <25% for soybeans) of the overall production and consumption of these crops (*see* Uncertainties and Unknowns in the Causal Chain Between the Proposed Action and Effects of the Action). Even with these uncertainties acknowledged, EPA

[14] On pages 5-6 of EPA's BE, it states: "It is possible that there may be no land use impacts at all to species/populations and their critical habitats due to the RFS Set 2 Rule volumes. For example, there would likely be no impact were the volumes to be met through other means such as increasing imports, decreasing exports of biofuels or feedstocks, or diverting feedstock from other non-biofuels use." On page 80, EPA stated "However, it is possible that land use changes may not impact the aquatic species at all if, for instance, a farmer uses best management conservation practices on the new cropland, or if the unique geomorphology of the land directs runoff to another location where the species is not present."

still took a highly conservative approach and assumed that the *entire* increase of renewable fuel demand attributable to the Set 2 Rule would result in a corresponding increase in domestic production. EPA's action area is based on a scenario that *all* increases in RFS volume requirements (Table 2) are met from converting land to biofuel cropland. Table 9 offers maximum potential increases in acreage, and EPA stated "[i]t is possible that there may be no land use impacts at all to species/populations and their critical habitats due to the RFS Set 2 Rule volumes" (*see* BE page 5). Therefore, the estimates for converted acres are *not* reasonably certain to occur as a result of the RFS Set 2 Rule standards alone. As we described further in *Uncertainties in Feedstock Land Conversion Estimations* above, EPA's modeling of converted lands overestimated the area of potential land use change because lands converted for corn and soybeans between 2002-2017 were all existing croplands, non-cultivated croplands, pasturelands, and CRP lands, and not non-cropland. EPA then used probabilistic modeling to assess effects to ESA-listed species and critical habitat based on their overestimated action area and extremely unlikely scenario estimates of land conversion from the Set 2 Rule; while we think the model itself represents the best available science, the parameterization EPA used does not represent what is reasonably certain to occur, but rather, an extremely unlikely worst-case scenario.

In addition, EPA stated they "cannot say with reasonable certainty that any particular species will be impacted, again due to the numerous layers of uncertainty between the finalized RFS Set 2 Rule volumes and on-the-ground, localized land use change" (*see* BE page 7) from their proposed action. As another example, in their report to Congress, EPA stated that "over the entire period assessed, the RtC3 estimates that 0–9% of corn ethanol production and consumption is likely attributable to the RFS Program historically" (*see* USEPA 2025b page 6-2). In accordance with the Handbook's guidance for evaluating whether an effect is "reasonably certain to occur," we considered the numerous economic, administrative, and legal hurdles remaining before the potential effects of the action would occur, and we determined that while agricultural activities associated with corn, soybeans, and canola markets are predicted to continue, the influence of and effects solely from the RFS program are unpredictable. We therefore determined that the effects of the proposed action are not reasonably certain to occur.

Additionally, the Service's long-standing interpretation of its regulations is that "reasonably certain to occur" is synonymous with "likely." 50 C.F.R. § 402.02 (2018); *see also* 51 Fed. Reg. 19926, 19933 (June 3, 1986) (explaining that "reasonably certain to occur" requires there to be "more than a mere possibility that the action may proceed" but "does not mean that there is a guarantee that an action will occur"). Under the ESA and its implementing regulations at 50 C.F.R. § 402.14(b)(1), the Service could also simply assess whether the proposed action is "likely" to adversely affect listed species when responding to EPA's request for concurrence. Whether we apply the term "reasonably certain to occur" (as it has been traditionally applied in accordance with the Handbook) or "likely" (meaning more likely than not), our conclusions about the scope of the effects of the action remain the same. As discussed above, given the various uncertainties associated with EPA's models, analysis, and the causal chain of effects (*see* Figure 1), we have also determined that the Set 2 Rule is *not likely* to result in indirect effects (i.e., agricultural land conversion) that adversely affect listed species or designated critical habitat.

Finally, applying the Handbook's definition of "not likely to adversely affect," our conclusion remains the same because any effects of the action are considered "discountable." Handbook at xv-xvi. We have determined that the Set 2 Rule is "not likely to adversely affect" listed species and designated critical habitats because any effects of the action would be considered "discountable"; that is, any effects are "extremely unlikely to occur," based on the expected causal chain between the Set 2 Rule and its potential effects. As we described above, each link in the causal chain between establishing the 2026–2027 RFS Set 2 Rule standards and effects to ESA-listed species and critical habitats (*see* **Description of EPA's Proposed Action**) that result from *only* RFS standards (i.e., effects decoupled from biofuels used for other purposes) include great uncertainty and high levels of conservative assumptions that are based on potential, modeled scenarios of land use changes that are extremely unlikely to occur, as described further in EPA's BE (*see* Step 1 - Estimation of Land Conversion for Biofuel Crops above). For example, EPA suggested, in their Third Report to Congress (USEPA 2025b) and in the RFS BE (USEPA 2026a) that non-cropland loss from land conversion for biofuels is unlikely to occur; overall acreage of biofuel cropland may increase, stay the same, or even decrease between 2026–2027, regardless of the RFS Set 2 Rule standards, because of market fluctuations and other factors outside of the RFS program. For these reasons, along with the various uncertainties associated with the causal chain as described above, we can conclude that the Set 2 Rule is "not likely to adversely affect" listed species and designated critical habitats because any effects of the action would be "extremely unlikely to occur" and therefore considered "discountable."

Regardless of effects of the action attributable to the RFS program, we expect that adverse effects from agricultural conversion and water quality degradation are extremely unlikely to occur for some species and critical habitats because of their life history characteristics, habitat type, or location. The ESA-listed and proposed species and designated and proposed critical habitats under Service jurisdiction that may be present in the action area are listed in Appendix 1. As we discussed above (*see Uncertainties Related to Listed Species Range and Designated Critical Habitat Units*), simply identifying overlap of a species' range or critical habitat with the largely overestimated action area does not necessarily mean that any adverse effects are likely to occur or be significant from the proposed action. Some habitats are not expected to be converted to agriculture, like forests, coastal beaches, Department of Defense lands, remote areas, protected lands, or unsuitable soils. For species in these habitats, we expect that land conversion to agriculture in general, regardless of the RFS Set 2 Rule, is extremely unlikely. For example, relict trillium and fisher are found in forests (USFWS 2023, USFWS 2025a). The spruce-fir moss spider is found in sky islands or high-elevation forests (USFWS 1998). Marbled murrelets are found in offshore maritime areas and old-growth forests (USFWS 1997). Choctawhatchee beach mouse and rufa red knots are found on coastal beaches (USFWS 2019b, USFWS 2020b). As described in Lark et al. 2015, forested areas are not likely to be converted to agriculture for biofuels (*see* BE page 73), and EPA focused their area of potential land use change on areas near existing corn, soybeans, and canola (i.e., which does not include remote areas) (*see* BE page 24). As another example of areas that are not likely to be converted, the majority of lands occupied by the green pitcher plant (USFWS 2025b), red wolf (USFWS 2024c), Saint Francis' satyr butterfly (USFWS 2025c), and *Pediocactus knowltonii* (USFWS 2021) are protected. For others, most individuals occupy areas under a land use incompatible with agriculture (e.g., eastern regal fritillary on Department of Defense lands; USFWS 2024d) or that contain soil types that are unsuitable for agriculture (e.g., star cactus; USFWS 2013). In addition, some species occur in habitats that are not near agriculture (e.g., Shenandoah salamander (USFWS 1994), *Astragalus magdalenae* var. *peirsonii* (USFWS 2024e)) or occur upland of agriculture in areas where runoff is not expected like the Socorro isopod (USFWS 2022c). For these species, we expect that land conversion to agriculture in general, regardless of the RFS Set 2 Rule, is extremely unlikely to occur, and therefore any adverse effects are considered discountable.

Critical habitat designated or proposed for ESA-listed species includes physical and biological features (PBFs) that are essential for the conservation of these species. We expect adverse effects to forested and woodland habitat PBFs are extremely unlikely to occur because these sites are not likely to be converted to agriculture than earlier successional habitats. Accordingly, we do not expect adverse impacts to some aquatic PBFs identified in the critical habitat designations for these species (such as water temperature, water velocity, water quantity, physical characteristics). Thus, for certain critical habitats, we expect that land conversion to agriculture in general, regardless of the RFS Set 2 Rule, is extremely unlikely to occur, and therefore any adverse effects are considered discountable.

We have reviewed and adopted EPA's determination that there would be no effect on listed species and critical habitat from non-crop-based biofuels (CNG and LNG derived from biogas and biodiesel and renewable diesel produced from waste fats, oils and greases) and regulatory changes that are administrative in nature. EPA's analysis in its BE is incorporated by reference.

Overall, the Service considered all the best scientific and commercial data available to assess the effects of the action that are likely to occur, including those that are reasonably certain to occur. Under either interpretation, our conclusions about the scope of the effects of the action remain the same. For example, our determination does not change that the best available scientific and commercial information (including, but not limited to, USDA CDL agricultural data, probabilistic model used by Li et al. 2019, and qualitative species-specific information) informs the scope of the effects of the action. We also maintain under any of the above approaches that the best available scientific and commercial information indicates that ESA-listed species and designated critical habitat are neither likely nor reasonably certain to experience adverse effects as a result of the RFS Set 2 Rule. To reach our conclusions, we did not require that any consequences of the action must be guaranteed to occur, nor did we establish a higher standard than is already required under the Endangered Species Act. For the reasons discussed above, we concur with EPA's determination that the RFS Set 2 Rule "may affect," but is "not likely to adversely affect" the ESA-listed species and critical habitats listed in Appendix 1 of this LOC.

This concludes informal consultation on the RFS Set 2 Rule. As stated at 50 C.F.R. § 402.16, reinitiation of consultation is required and shall be requested by EPA or by the Service, where discretionary federal involvement or control over the action has been retained or is authorized by law and: if new information reveals effects of the action that may affect ESA-listed species or designated critical habitats in a manner or to an extent not previously considered; if the identified action is subsequently modified in a manner that causes an effect to ESA-listed species or designated critical habitats that was not considered in the written concurrence; or, if a new species is listed or critical habitat designated that may be affected by the identified action. We appreciate your coordination throughout the informal consultation process. If you have any questions, please contact Keith Paul of my office at (703) 358-2675.

Sincerely,

PAUL DI SALVO

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FOR Craig Aubrey
Manager, Division of Environmental Review

Attachment: Appendix 1 Fish and Wildlife Service LOC - Species and Critical Habitat List - RFS Set 2 Rule.pdf

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