

# Chapter 1 OVERVIEW

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## 1.1 Purpose of the Biological Assessment

In November 2004, the U.S. Department of the Interior, Bureau of Reclamation (Reclamation) initiated formal consultation under Section 7 of the Endangered Species Act (ESA) by submitting a biological assessment (BA) to the U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NMFS). The *Biological Assessment for Bureau of Reclamation Operations and Maintenance in the Snake River Basin above Brownlee Reservoir* (2004 Upper Snake BA) (USBR 2004a) described 12 separate actions involving operations and routine maintenance at 12 Federal projects located upstream of Brownlee Reservoir and evaluated the potential effects of those actions on ESA-listed endangered or threatened species and their designated critical habitat. The projects, collectively referred to as the upper Snake projects, were the Minidoka, Palisades, Michaud Flats, Ririe, Little Wood River, Boise, Lucky Peak, Mann Creek, Owyhee, Vale, Burnt River, and Baker Projects. Reclamation initiated consultation because the existing biological opinion (BiOp) expired before the start of the 2005 irrigation season, and some components of the proposed actions differed from the actions consulted upon in the previous consultation. Most notable was the development of the Nez Perce Water Rights Settlement that described the conditions for continued provision of salmon flow augmentation from the upper Snake.

Reclamation received a BiOp from NMFS in March 2005 (2005 Upper Snake BiOp) (NMFS 2005a). The 2005 Upper Snake BiOp concluded that Reclamation's proposed actions were not likely to jeopardize the continued existence of 13 Columbia River basin salmon Evolutionarily Significant Units (ESUs) and steelhead Distinct Population Segments (DPSs) listed or proposed for listing under the ESA or to adversely modify or destroy designated critical habitat for three ESUs.

In 2005, American Rivers and others filed a suit alleging Administrative Procedures Act (APA) and ESA violations (*American Rivers v. NOAA Fisheries*). On May 23, 2006, Oregon U.S. District Judge James Redden held that NMFS' March 2005 Upper Snake BiOp contained flawed analysis and did not comply with the ESA or APA. On September 26, 2006, Judge Redden issued an Opinion and Order of Remand providing details on how Federal defendants must revise the consultation to correct these deficiencies.

Reclamation has prepared this current biological assessment (2007 Upper Snake BA) to analyze its proposed actions consistent with the Court's findings and assist NMFS with the preparation of a BiOp that will comply with ESA and satisfy the direction given by the Court in its Orders. This 2007 Upper Snake BA builds upon and updates as appropriate information contained in the 2004 Upper Snake BA, incorporating by reference factual information and replacing the analyses in accordance with the Court's opinion. The reader is referred to that document for information about Reclamation's proposed actions. This 2007 Upper Snake BA proposes refinements to some of its proposed actions for the purposes of benefiting listed fish and designated critical habitat. Analytical information is also provided to supplement or update information provided in the 2004 Upper Snake BA.

Reclamation proposes to undertake 12 separate Federal actions in the Snake River basin upstream from Brownlee Reservoir (upper Snake River basin). While not required by the ESA or the ESA regulations, Reclamation has chosen, as a matter of administrative convenience, to address all proposed actions in a single BA. In turn, Reclamation is requesting that NMFS, as permitted by 50 CFR 402.14(c), enter into a single consultation and issue a single BiOp regarding all 12 proposed actions to the extent formal consultation is required by law.

## 1.2 Proposed Actions

Reclamation's future actions in the upper Snake are described in its 2004 Upper Snake BA (USBR 2004a) and supporting documents. That BA initially identified 11 separate proposed actions. The 2004 Upper Snake BA was later amended to add a twelfth action after it had been submitted to NMFS. A proposed action was defined by project facilities that are located within the same drainage and are operationally coordinated as one action. For example, the operations and routine maintenance of the Michaud Flats, Minidoka, Palisades, and Ririe Projects, located above Milner Dam on the Snake River near Twin Falls, Idaho, are defined as one separate action because the operations of these project facilities are coordinated with one another. Similarly, the operations and routine maintenance of the facilities on the Boise drainage (Anderson Ranch, Arrowrock, and Lucky Peak Dams and Reservoirs) are coordinated and are considered another separate action.

Reclamation has proposed some refinements to its proposed actions with respect to delivery of flow augmentation water. The proposed actions and these refinements are described further in Chapter 2. This 2007 Upper Snake BA analyzes the effects resulting from both the discretionary and non-discretionary components of these proposed actions.

## 1.3 Action Area

The action area for each individual proposed action remains the same as described in the 2004 Upper Snake BA at pages 3 through 5 and in Chapter 2. The features and facilities of the 12 Federal projects included in the proposed actions are all upstream of Brownlee Dam, an Idaho Power Company (Idaho Power) facility on the Snake River at river mile (RM) 285, and upstream of the occurrence of the 13 listed salmon ESUs and steelhead DPSs considered here. The combined effects of Reclamation's separate upper Snake actions on listed anadromous fish begin at Brownlee Reservoir and extend from Hells Canyon Dam downstream to the Columbia River estuary. This 2007 Upper Snake BA focuses on flow effects beginning at Brownlee Reservoir and resulting effects to listed fish downstream to the Columbia River estuary as this is the area relevant to the ESA-listed salmon and steelhead and their critical habitat.

## 1.4 Nez Perce Water Rights Settlement

Reclamation's actions in the upper Snake include the provision of flow augmentation to benefit migrating salmon and steelhead. Reclamation has provided flow augmentation to benefit fish since 1991. Longstanding disputes over water allocation were addressed by the 2004 Nez Perce Water Rights Settlement (Settlement) and the Snake River Water Rights Act of 2004 (P.L. 108-447), which includes provisions to allow Reclamation's continued delivery of flow augmentation water for a 30-year period (through 2034).

The Nez Perce Water Rights Settlement was negotiated through adjudication proceedings for the Snake River basin in Idaho, which began in 1987. The Snake River Basin Adjudication (SRBA) is a general adjudication of water rights in Idaho's Snake River basin. During general adjudication, the McCarren Amendment (43 USC 666) requires the Federal government to assert its water right claims for adjudication in State court. In 1993, the United States, as Trustee for the Nez Perce Tribe, and the Tribe in its own behalf, filed water right claims in the SRBA for fish habitat and habitat protection, with a "time immemorial" priority date. The claims involved substantial volumes of water.

After the initial rounds of negotiations failed to produce a settlement, the Court began proceedings on the Federal and Tribal claims in the fall of 1997. In 1998, private objectors to the Tribal claims suggested mediated negotiations, which later resulted in the Nez Perce Water Rights Settlement (Nez Perce Tribe et al. 2004) in May 2004. The United States approved the Settlement as the Snake River Water Rights Act of 2004. Idaho and the Tribe approved the Settlement on March 24, 2005, and March 29, 2005, respectively.

All actions required for full implementation of the Settlement were recently completed and, in accordance with the 2004 Act, the Secretary of the Interior executed a final Statement of Findings: Snake River Water Rights Act in the Federal Register (72 FR 27325) on May 15, 2007, certifying that all conditions for effectiveness of the agreement have been satisfied including:

- Execution of all necessary documents
- Approval and ratification by Congress and authorization of Federal expenditures
- Approval and ratification by the Idaho State Legislature and enactment of required State legislation
- Ratification by the Nez Perce Tribe
- Issuance of a final judgment and decrees by the SRBA District Court
- Issuance of BiOps for the Snake River Flow component

The Settlement consists of three components: the Nez Perce Tribal, the Salmon/Clearwater, and the Snake River Flow components. The following summarizes key elements of each component. Appendix A provides more information about the Settlement.

The Nez Perce Tribal component addresses the Tribe's consumptive water rights claims on-reservation, provides funds for water development, and resolves other on and near reservation issues. This component gave the Nez Perce Tribe, in conjunction with an intergovernmental board comprised of the Tribe, U.S. Army Corps of Engineers (USACE), Bonneville Power Administration (BPA), NMFS, and the State, use of 200,000 acre-feet of water stored in Dworshak Reservoir, located on the North Fork Clearwater River on the Reservation. This water can be used for flow augmentation and temperature control (cooling) in the lower Snake River in August and September. This measure is intended to benefit juvenile and adult fall Chinook and adult steelhead by shaping cool flows into September.

The Salmon/Clearwater component addresses fish habitat protection throughout the Salmon and Clearwater River basins through a cooperative agreement under Section 6 of the ESA that includes adoption of minimum instream flows by the State and establishment of a habitat trust fund. Consequently, the Idaho Water Resource Board now holds in trust for the public, minimum streamflow rights on over 200 rivers, streams, and creeks in the Salmon and Clearwater River basins that the Tribe identified as Tribal Priority Streams for critical spawning and rearing habitat for ESA-listed spring Chinook salmon, steelhead ("A" and "B" run), and fall Chinook salmon. The objective of establishing minimum streamflows is to ensure these streams are not dewatered to a level that impairs spawning and rearing or other ecological functions that support salmon, steelhead, and the aquatic environment. Appendix A provides additional information about the Salmon/Clearwater minimum streamflows.

Another element is the contribution by the United States of \$38 million (in 2004 dollars) over the course of 5 years, beginning in 2007, for a habitat trust fund to implement fish and habitat protection projects. The purpose of the fund is to supplement monies otherwise available for habitat protection and restoration in the Salmon and Clearwater River basins. Congress has appropriated the 2007 dollars. The out-year funding is anticipated to be appropriated on an annual basis.

The Snake River Flow component addresses flows from the Snake River upstream of Brownlee Reservoir and the conditions for use of water for flow augmentation. The proposed actions described in Reclamation's 2004 Upper Snake BA and this 2007 Upper Snake BA are consistent with the terms of the Snake River Flow component of the Settlement. Of significance to Reclamation's upper Snake flow augmentation activities, the Settlement increases the probability of delivering 427,000 acre-feet of flow augmentation water. Prior to the SRBA and the Nez Perce Water Rights Settlement, Idaho law limited the volume of water that could be protected for flow augmentation to 427,000 acre-feet from all sources. In addition, the laws addressing flow augmentation were short-term and were typically renegotiated every few years or annually. Under the Settlement, Idaho Code § 42-1763B was reenacted to authorize the rental and protection to the state line of up to 427,000 acre-feet of water annually for flow augmentation from traditional sources for the 30-year term of the agreement (through 2034). It also provided that Reclamation could rent or acquire for protection to the state line 60,000 acre-feet of water from natural water right holders along the Snake River. Also authorized was the release and protection of water stored in reservoir powerhead space to firm up the ability to provide 427,000 acre-feet. These provisions improve Reclamation's ability to provide water for flow augmentation by increasing the long-term probability of obtaining 427,000 acre-feet, and in some years providing as much as 487,000 acre-feet, and by minimizing the uncertainties related to the ability to protect the water in accordance with State law.

## **1.5 Integration with Federal Columbia River Power System Remand**

In *American Rivers v. NOAA Fisheries*, Judge Redden ordered that the upper Snake remand be integrated with the Federal Columbia River Power System (FCRPS) remand to ensure a comprehensive analysis. However, he affirmed that the agencies were not required to address FCRPS and upper Snake actions in one BiOp and allowed for separate consultations and separate BiOps.

The FCRPS Action Agencies (Reclamation, USACE, and BPA) have undergone ESA Section 7 consultation on the effects of the FCRPS actions on listed salmon and steelhead since the early 1990s. The current FCRPS litigation began in 2001 when the National Wildlife Federation et al. (NWF) challenged the adequacy of the 2000 FCRPS

BiOp. In 2003, Judge Redden, U.S. District Court of Oregon, found the 2000 FCRPS BiOp “arbitrary and capricious” and remanded it to NMFS. NMFS completed a revised FCRPS BiOp in November 2004. The NWF challenged the 2004 FCRPS BiOp, and in October 2005, the Court ordered a remand of the 2004 FCRPS BiOp to make a jeopardy determination that complies with the ESA and legal deficiencies. In accordance with the Court’s instructions, NMFS and the Action Agencies are collaborating with four states and seven Tribes to revise the 2004 FCRPS BiOp to develop actions to include in the proposed action, clarify policy issues, and narrow areas of disagreement on scientific and technical information.

The remand consultation on Reclamation’s upper Snake actions is proceeding simultaneously with the FCRPS remand collaborative process. The Federal agencies are working together to implement the Court’s instructions in *American Rivers v. NOAA Fisheries* and have developed a comprehensive analysis of the effects of Reclamation’s upper Snake actions together with the effects of the FCRPS actions. The comprehensive analysis is contained in the *Comprehensive Analysis of the Federal Columbia River Power System and Mainstem Effects of Upper Snake and Other Tributary Actions* (hereafter *Comprehensive Analysis*) (USACE et al. 2007b) and includes an evaluation of the effects of: (1) the proposed FCRPS actions, (2) the proposed upper Snake actions, (3) the environmental baseline, and (4) cumulative effects. The analysis comprehensively evaluates all these effects, factoring species status, and applies the jeopardy framework described in memoranda prepared by Robert Lohn, NMFS Regional Administrator, dated July 12, 2006, and September 11, 2006 (Lohn 2006b and 2006a). Two separate BiOps are requested – one that addresses the effects attributed to the FCRPS and one that addresses the upper Snake effects. This 2007 Upper Snake BA provides information specific to the upper Snake that was incorporated into the *Comprehensive Analysis*.

The upper Snake projects and the FCRPS are operated independent of each other. However, both operations hydrologically influence flows in the Snake and Columbia Rivers. Any flow-related effects to listed salmon and steelhead due to operation of Reclamation’s upper Snake projects occur well downstream of these projects, because no listed salmon or steelhead occur in the vicinity of Reclamation’s upper Snake storage reservoirs or diversion structures. The upper Snake actions directly affect inflows to Brownlee Reservoir. From here, Idaho Power Company regulates flows through the Hells Canyon Complex. The analysis of the effects of upper Snake actions in this 2007 Upper Snake BA begins at the toe of Hells Canyon Dam and extends downstream to the Columbia River estuary. FCRPS effects occur in much of the same area as well as other areas, such as reaches of the Columbia River and certain tributaries above its confluence with the Snake River.

## 1.6 Comprehensive Analysis

In order to integrate the upper Snake and FCRPS analyses, the action agencies incorporated information from both river basins into biological analyses for each ESU or DPS so that a collective or comprehensive conclusion can be made as to the status of each. These biological analyses provide the foundation for a comprehensive analysis that will inform the Upper Snake and FCRPS BiOps and are contained in a separate document entitled *Comprehensive Analysis of the Federal Columbia River Power System and Mainstem Effects of Upper Snake and Other Tributary Actions (Comprehensive Analysis)* (USACE et al. 2007b).

The analyses estimate changes in both survival and recovery metrics in a step-wise fashion taking into account recently implemented or planned changes in hydropower operations and configuration, improvements in tributary and estuary habitat (short- and long-term), reduced predation, and changes in hatchery and harvest management. The first adjustment of population-level metrics was from a historical base period to current conditions (base-to-current), and the second adjustment was from current conditions to expected future status (current-to-prospective). The analysis contained in the *Comprehensive Analysis* document relies on commonly used and accepted biological metrics that measure life cycle survival, as well as estimated extinction risk under different modeling assumptions.

This step-by-step process was followed to assess the collective effects and benefits for each ESU and DPS for actions in five areas—hydropower, habitat, harvest, hatchery, and predation. The upper Snake flow effects are combined with the FCRPS flow effects and evaluated in the hydropower effects analysis. The following generally describes this hydropower analysis. Refer to Chapter 3 and Appendix B of the *Comprehensive Analysis* (USACE et al. 2007b) for a more detailed description of this analysis.

The agencies relied on both hydrologic and biological model outputs and previous analyses for assessing the combined flow effects attributable to hydropower actions (Federal and private) on the Snake and Columbia Rivers. The analysis included an assessment of Federal storage, diversion, flood control, and hydropower generation both above and below Brownlee Dam and their effect on mainstem Snake and Columbia River flows. It also examined the combined flow effects attributed to Reclamation's and private activities in the upper Snake River as well as those attributed to FCRPS operations and private operations in the lower Snake and Columbia Rivers. The analysis incorporated an ESU-by-ESU (and DPS-by-DPS) analysis for three primary time periods of hydropower system existence: the base (corresponding to the general conditions that were experienced by juveniles during the 1980-2001 outmigrations); current; and prospective conditions—with results reported as an average across all water years.

Reclamation's MODSIM model was used to estimate the hydrologic effects resulting from operations and existence of the upper Snake projects. Reclamation's Upper Snake River MODSIM hydrology model (2007 version) developed monthly inflows to Brownlee Reservoir taking into account all Reclamation operations (storage of water, release from storage, diversion for irrigation or other purposes, delivery for flow augmentation, pumping of ground water, and project return flows), private activities (private storage dams, diversions of private water rights into private canals, private pumping of ground and surface water, and return flows), and variable weather conditions (based on the period from 1928 through 2000). Appendix B and Chapter 3 of this BA provide additional information about the Upper Snake MODSIM model and the modeled analyses.

The Brownlee Reservoir inflows developed by MODSIM were then incorporated as input into the HYDSIM model. The HYDSIM model, among other things, simulates flow conditions at key locations in the mainstem Snake and Columbia Rivers resulting from operation of the FCRPS, upper Snake, and non-Federal dams, including the major Canadian projects on the mainstem Columbia River. The modeled flows developed by HYDSIM are thus inclusive of all flow effects that occur in the Snake River basin above and below Brownlee Dam and on the Columbia River, including shifts in timing and depletions associated with Federal storage operations, flood control, hydropower generation, and water deliveries as well as all private activities, including depletions for irrigation, hydropower, and other activities. The HYDSIM model runs were made to simulate both the current and prospective operations.

Data output from the HYDSIM model, representing the combined flow conditions associated with Federal and non-Federal activities in the upper Snake, lower Snake, and Columbia Rivers, were then input into the NMFS' COMPASS model. The COMPASS model used the combined flow conditions and spill levels developed by HYDSIM (along with estimated water temperatures) as input to estimate the combined direct survival of smolts to below Bonneville Dam (the survival of smolts migrating "inriver" through the mainstem FCRPS dams plus the survival of smolts transported from the Snake River collector projects). Finally, the COMPASS smolt survival estimates were adjusted to derive estimated changes in below-Bonneville survival, based on changes in smolt-to-adult returns associated with estuary arrival time resulting from proposed management actions for "inriver" and transported juveniles (using the Scheurell and Zabel hypothesis). The COMPASS survival outputs were developed for current and prospective conditions (see Appendix B, *Comprehensive Analysis* for COMPASS results (USACE et al. 2007b).

Relative changes in hydropower survival were estimated for base-to-current and current-to-prospective periods. This information was then incorporated into the biological analysis, which combined the survival improvements calculated for hydropower with those developed for habitat, hatchery, harvest, and predation to

determine the prospective or future status of each ESU and DPS. The methods used for analysis of habitat, hatchery, harvest and predation actions are described in Chapter 3 and Appendices C through G of the *Comprehensive Analysis* (USACE et al. 2007b) and form the basis for determinations about jeopardy and adverse modification to designated critical habitat for the combined actions.

## 1.7 Duration of Proposed Actions

In 2004, Congress passed the Snake River Water Rights Act of 2004 which implements the Nez Perce Water Rights Settlement Agreement. The Snake River Water Rights Act provides in pertinent part: “the Secretary of Interior and the other heads of Federal agencies with obligations under the Agreement shall execute and perform all actions, consistent with this Act, that are necessary to carry out the Agreement.” See Snake River Water Rights Act § 4, Pub. L. No. 108-447, 2004 U.S.C.A. (118 stat. 2809, 3433). The Settlement in turn provides: “The term of this [Snake River Flow] component of the agreement shall be for a period of thirty (30) years with opportunity for renewal upon mutual agreement” (see Settlement Term Sheet at Section III.A and III.K, Nez Perce Tribe et al. 2004). Thus, as specified by Congress, the term of Reclamation’s proposed actions and upper Snake consultation is 30 years, commencing in 2005 through 2034.

The provisions of the Snake River Flow component of the Nez Perce Water Rights Settlement form the foundation for the proposed actions for this consultation. The Settlement provides a framework for administrative and legislative actions that make possible certain aspects of the proposed actions. For example, State protection of water provided for flow augmentation has been achieved through changes to Idaho State law enacted by the Idaho Legislature for the 30-year duration of the Snake River Flow component of the Settlement (through 2034). Similarly, Reclamation has secured a 30-year lease of 60,000 acre-feet of private natural flow water rights, granted solely under the authorities of the State of Idaho, pursuant to the same Idaho statute.

The term of the FCRPS Reasonable and Prudent Alternatives (RPA) is 10 years. The objective of the FCRPS consultation is to determine whether the 10-year program of actions will avoid jeopardy and adverse modification of critical habitat and whether it will result in a trend toward recovery for the ESUs and DPSs and the conservation values of primary constituent elements for designated critical habitat, including its future effects, beyond the last year of the program’s implementation. The *Comprehensive Analysis* (USACE et al. 2007b) evaluates the effects from the FCRPS activities occurring through 2017.

The *Comprehensive Analysis* (USACE et al. 2007b) contains a quantitative and qualitative analysis of the combined upper Snake and FCRPS actions and considers various factors in addressing the risks of extinction and prospects for survival and recovery for listed salmon and steelhead through the year 2017 (a 10-year period). Section 1.6 of this BA briefly describes this analysis.

Reclamation recognizes the temporal difference between the FCRPS proposed RPA and the upper Snake proposed actions and the resulting challenge of conducting a comprehensive analysis of both actions. Under existing case law, Reclamation is required to conduct an analysis that is coextensive with the 30 year duration of the actions proposed in this 2007 Upper Snake BA. In order to evaluate the effects of the upper Snake actions through the year 2034, Reclamation assumed that FCRPS operations would continue as proposed in the FCRPS BA (USACE et al. 2007a). Reclamation used modeled hydrologic data from MODSIM and HYDSIM to use as part of a qualitative analysis of the hydrologic effects of the upper Snake actions for the years 2017 through 2034. This qualitative analysis is contained in Chapter 4 of this 2007 Upper Snake BA. The modeled MODSIM and HYDSIM data are contained in Chapter 3.

Reclamation will review the upper Snake consultation in 2017 to determine whether a continuation of the proposed action is acceptable given the conditions of the various populations at the ESUs and DPS at that time. This commitment ensures that if the FCRPS action changes after 2017, Reclamation will re-evaluate its analysis. Further, Reclamation and NMFS will continually review the status of listed salmon and steelhead, Reclamation's performance, and other factors to determine whether the triggers specified in 50 CFR 406.16 require earlier reinitiation of consultation.

## **1.8 Summary of Determinations of Effects for Species and Designated Critical Habitat**

Table 1-1 summarizes the determination of effects for species and designated critical habitat. *Section 4.3, Effects Analysis* provides the details and rationale for the determinations.

**Table 1-1. Summary of determinations of effects for species and designated critical habitat.\***

ESU/DPS	Species Effects Determination	Critical Habitat Effects Determination
Snake River Spring/Summer Chinook Salmon ESU ( <i>Oncorhynchus tshawytscha</i> )	MA, LAA	Affect
Snake River Fall Chinook Salmon ESU ( <i>O. tshawytscha</i> )	MA, LAA	Affect
Snake River Sockeye Salmon ESU ( <i>O. nerka</i> )	MA, LAA	Affect
Snake River Basin Steelhead DPS ( <i>O. mykiss</i> )	MA, LAA	Affect
Upper Columbia River Spring Chinook Salmon ESU ( <i>O. tshawytscha</i> )	MA, NLAA	Unmeasurable
Lower Columbia River Chinook Salmon ESU ( <i>O. tshawytscha</i> )	MA, NLAA	Unmeasurable
Upper Willamette River Chinook Salmon ESU ( <i>O. tshawytscha</i> )	MA, NLAA	Unmeasurable
Upper Columbia River Steelhead DPS ( <i>O. mykiss</i> )	MA, NLAA	Unmeasurable
Middle Columbia River Steelhead DPS ( <i>O. mykiss</i> )	MA, NLAA	Unmeasurable
Lower Columbia River Steelhead DPS ( <i>O. mykiss</i> )	MA, NLAA	Unmeasurable
Upper Willamette River Steelhead DPS ( <i>O. mykiss</i> )	MA, NLAA	Unmeasurable
Upper Willamette River Chinook Salmon ESU ( <i>O. tshawytscha</i> )	MA, NLAA	Unmeasurable
Columbia River Chum Salmon ESU ( <i>O. keta</i> )	MA, NLAA	Unmeasurable
Lower Columbia River Coho Salmon ESU ( <i>O. kisutch</i> )	MA, NLAA	Not applicable

\* MA, LAA = may affect, likely to adversely affect; MA, NLAA= may affect, not likely to adversely affect

