

QUANTIFYING, MONITORING, AND TRACKING “TAKE”
UNDER THE ENDANGERED SPECIES ACT: THE PROMISE
OF A MORE INFORMED APPROACH TO CONSULTATION

BY
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This Article explores recent court rulings concerning how the United States Fish and Wildlife Service and National Marine Fisheries Service (Services) specify the level of “take” anticipated in their formal consultation decisions and how these rulings provide a much needed impetus and incentive for the Services to track the status and cumulative take of species listed under the Endangered Species Act. This Article argues that consistent with the findings of the Government Accountability Office’s 2009 Report, the Services must implement a systematic means for tracking the monitoring reports required by the Services in their consultation decisions as well as a systematic program for tracking the cumulative take of all listed species. This Article further argues that the tracking of monitoring reports and the tracking of cumulative take should not be discrete tasks reserved for the Services. By utilizing several different provisions of the Act, the Services can harness federal, state, and private entities to assist the Services in achieving a comprehensive approach to monitoring and tracking take. An integrated, interagency approach may facilitate the development of these tracking programs and yield a more comprehensive, informed, and proactive approach to endangered species conservation.

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I. INTRODUCTION

The Endangered Species Act (ESA or Act)¹ prohibits the “take” of endangered and threatened species. Take is defined broadly to include the killing, harming, and harassment of listed species.² Section 7 of the Act requires federal agencies to consult with the U.S. Fish and Wildlife Service (FWS) or National Marine Fisheries Service (NMFS) (collectively Services) to determine the effects of their actions on endangered species and to ensure that those actions do not jeopardize listed species or adversely modify their critical habitat.³ As part of this consultation process, the Services prepare a biological opinion to evaluate the effects of such actions.⁴ If an action does not jeopardize a listed species, the biological opinion may provide an incidental take statement (ITS) allowing for the take of listed species so long as it is incidental to and not the purpose of the activity.⁵

Finding that an ITS is more than just a permission slip to take listed species, recently, courts are requiring the Services to specify the level of incidental take anticipated by the action sufficiently enough so that it can provide an adequate “trigger” for the re-initiation of consultation if the original take level specified in the biological opinion is exceeded.⁶ Without such a trigger, the action runs the risk of potentially jeopardizing the species if no subsequent consultation is ever required to evaluate the additional take of listed species. To this end, courts have required the Services to provide a numeric measure of take unless doing so is impractical, in which case the Services may specify the extent of take through an ecological surrogate that

¹ Endangered Species Act of 1973, 16 U.S.C. §§ 1531–1544 (2006).

² *Id.* § 1532(19).

³ *Id.* § 1536(a)(2).

⁴ 50 C.F.R. § 402.14(h) (2009).

⁵ *Id.* §§ 402.02, 402.14(i).

⁶ *See* Miccosukee Tribe of Indians of Fla. v. United States, 566 F.3d 1257, 1271–72 (11th Cir. 2009); Or. Natural Res. Council v. Allen (*ONRC v. Allen*), 476 F.3d 1031, 1038 (9th Cir. 2007).

is linked to the take of the species.⁷ An ecological surrogate is an expression of take in terms of anticipated losses or changes in species habitat.⁸

Measuring the amount of incidental take through numeric values is the preferred approach for several reasons. It provides the clearest assessment of the number of members of a species that may be taken by a particular project without jeopardizing the species and it provides a clearly defined trigger to reinstate consultation if and when the anticipated level of take is exceeded.⁹ Further, by requiring the Services to utilize numeric take measures, courts provide action agencies with the impetus and incentive to abide by these clearly defined measures of take and to monitor the effects of their actions to ensure that the impacts of such actions are not resulting in greater harm to the species than that which is permitted by the biological opinion. Numeric measures also assist the Services in developing an ongoing tally of the number of species lost due to past federal actions. This assessment of “cumulative take” enables the Services to adjust the environmental baseline accordingly and evaluate the effects of future actions in subsequent biological opinions and determine the acceptable level of take based on this information. It also assists the Services in evaluating the overall recovery efforts of a particular species. Thus, with the quantification of incidental take comes increased agency awareness and accountability in the decision-making process.

Despite the requirement that the Services provide a numeric measure of take in their biological opinions unless otherwise impractical, the Government Accountability Office (GAO) issued a report in 2009 finding that FWS lacks a systematic method for tracking the monitoring reports it requires in biological opinions and the agency still has no means of tracking the cumulative take of most species.¹⁰ As a result, the report warned that the

⁷ See *Miccosukee Tribe of Indians of Fla.*, 566 F.3d at 1274–75; *Ariz. Cattle Growers’ Ass’n v. U.S. Fish & Wildlife*, 273 F.3d 1229, 1238 (9th Cir. 2001); *Ctr. for Biological Diversity v. Bureau of Land Mgmt.*, 422 F. Supp. 2d 1115, 1137–39 (N.D. Cal. 2006); *Natural Res. Def. Council, Inc. v. Evans (NRDC v. Evans)*, 279 F. Supp. 2d 1129, 1185–87 (N.D. Cal. 2003).

⁸ See *Nw. Env’tl. Def. Ctr. v. Nat’l Marine Fisheries Serv.*, 647 F. Supp. 2d 1221, 1239–40 (D. Or. 2009) (using an ecological surrogate for the take of listed salmon of 3600 pile strikes per day or more than seventeen boats docked at one time during the construction and operation of a dock); *Swan View Coal. v. Barbouletos*, No. CV 05-64-M-DWM, 2008 WL 5682092 at *12 (D. Mont. Mar. 31, 2008) (using road density and security core habitat as ecological surrogates for the take of grizzly bears); *Pac. Shores Subdivision Cal. Water Dist. v. U.S. Army Corps of Eng’rs*, 538 F. Supp. 2d 242, 257 (D.D.C. 2008) (relying on an ecological surrogate of 7500 acres of suitable tidewater habitat loss per year or up to 75,000 acres of habitat loss over the life of the permit).

⁹ U.S. FISH & WILDLIFE SERV. & NAT’L MARINE FISHERIES SERV., CONSULTATION HANDBOOK: PROCEDURES FOR CONDUCTING CONSULTATION AND CONFERENCE ACTIVITIES UNDER SECTION 7 OF THE ENDANGERED SPECIES ACT 4–50 (1998).

¹⁰ U.S. GOV’T ACCOUNTABILITY OFFICE, GAO-09-550, ENDANGERED SPECIES ACT: THE U.S. FISH & WILDLIFE SERVICE HAS INCOMPLETE INFORMATION ABOUT EFFECTS ON LISTED SPECIES FROM SECTION 7 CONSULTATIONS (2009) [hereinafter GAO REP. NO. GAO-09-550]. It does not appear that NMFS has a systematic means of tracking cumulative take either. See Daniel J. Rohlf, *Jeopardy Under the Endangered Species Act: Playing a Game Protected Species Can’t Win*, 41 WASHBURN L.J. 114, 157 (2001) (“[T]he agencies have virtually no procedures in place to actually

lack of a systematic means to track take results in a knowledge gap concerning the status of listed species and exposes FWS to unobserved declines in species, not to mention, additional litigation.¹¹

This Article explores the recent court rulings concerning how the Services specify the amount of take in their ITSs and the importance of these court rulings in the context of monitoring take and evaluating cumulative take. This Article argues that consistent with the findings of the 2009 GAO Report, both a comprehensive system for monitoring take and a system for tracking cumulative take must be implemented by the Services.

This Article further argues that the tracking of monitoring reports and the tracking of cumulative take should not be discrete tasks reserved for the Services. By utilizing several different provisions of the Act, the Services can harness federal, state, and private entities to assist the Services in achieving a comprehensive approach to monitoring and tracking take. An integrated, interagency approach to monitoring and tracking cumulative take may facilitate the development of tracking programs and yield a more informed, proactive approach to evaluating the cumulative effects of agency actions and planning for future take. As this Article will explain, a systematic, integrated tracking program will likely reveal which particular agency actions are having the greatest impact on listed species and provide the necessary data for agencies to effectively plan for and minimize future species impacts in a particular geographic area and beyond. Lastly, adopting an interagency approach that utilizes all relevant provisions of the Act to achieve these goals will not only allow the Services to utilize the data gathered from monitoring and tracking programs to make better section 7 consultation decisions but also better inform the Services' administration of the Act as a whole.

II. THE ENDANGERED SPECIES ACT

The purpose of the Endangered Species Act is in part “to provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved [and] to provide a program for conservation of such endangered and threatened species.”¹² The Act contains several provisions that set forth a process toward accomplishing the Act's mission of species conservation.¹³

Section 4 of the Act provides for the listing of species as “endangered” or “threatened”¹⁴ and requires the Services to develop and implement recovery plans for each listed species.¹⁵ Each recovery plan must contain a description of site-specific management actions for the conservation of the

keep track of the amount of incidental take that they themselves have authorized, much less methods for otherwise tracking the current status and trends of the species.”)

¹¹ GAO REP. NO. GAO-09-550, *supra* note 10, at 23.

¹² Endangered Species Act of 1973, 16 U.S.C. § 1531(b) (2006).

¹³ See *ONRC v. Allen*, 476 F.3d 1031, 1033 (9th Cir. 2007).

¹⁴ 16 U.S.C. § 1533(c) (2006).

¹⁵ *Id.* § 1533(f).

species, objective measurable criteria that, when met, would lead to the delisting of the species, and estimates of the time and costs required to carry out those measures necessary to achieve species recovery.¹⁶

Under section 9 of the Act, the take of an endangered species is prohibited.¹⁷ The Act defines “take” as “to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct.”¹⁸ “Harm” includes “significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering.”¹⁹

Section 7 of the Act requires federal agencies to prevent violations of section 9.²⁰ When any federal agency authorizes, funds, or carries out any action that may affect a listed species, the “action agency” must consult with either FWS or NMFS²¹ to ensure that the action will not likely “jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification” of that species’s critical habitat.²² This consultation process usually begins informally as the action agency and either FWS or NMFS evaluate the potential effects of the action on listed species and determine whether any listed species is “likely to be adversely affected by the action.”²³ If the action is not likely to adversely affect a listed species and the Services concur, then the consultation process is over.²⁴

If, however, it is determined that the action is likely to adversely affect a listed species, then the action agency must initiate formal consultation with FWS or NMFS.²⁵ This formal consultation process culminates with the Services issuing a biological opinion. The biological opinion starts with an assessment of the environmental baseline.²⁶ 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

¹⁶ *Id.* § 1533(f)(1)(B)(i)–(iii).

¹⁷ *Id.* § 1538(a)(1)(B).

¹⁸ *Id.* § 1532(19).

¹⁹ 50 C.F.R. § 17.3 (2009).

²⁰ *Ariz. Cattle Growers’ Ass’n*, 273 F.3d 1229, 1238 (9th Cir. 2001) (citing 16 U.S.C. § 1536(a)(2)(2006)).

²¹ The U.S. Fish and Wildlife Service has jurisdiction over terrestrial species, nonmarine aquatic species, and certain marine species while the NMFS has jurisdiction over marine species, including anadromous fish. See Donald C. Baur & William Robert Irvin, *Overview to AM. BAR ASS’N, ENDANGERED SPECIES ACT: LAW, POLICY, AND PERSPECTIVES* xi–xii (Donald C. Baur & William Robert Irvin eds., 2002).

²² 16 U.S.C. § 1536(a)(2) (2006).

²³ 50 C.F.R. § 402.12(a) (2009).

²⁴ *Id.* § 402.12(d)(1).

²⁵ *Id.* §§ 402.01(b), 402.14.

²⁶ *Id.* § 402.12(a).

section 7 consultation, and the impact of State or private actions which are contemporaneous with the consultation in process.²⁷

The action area is defined as “all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action.”²⁸ Once the baseline is established, the Services evaluate the effects and cumulative effects the action will have on the species.²⁹ The effects of the action include “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.”³⁰ “Cumulative effects are those effects of future State or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation.”³¹ Once the Services analyze these impacts, they make a finding as to whether the action “is likely to jeopardize the continued existence of the listed species.”³² To “jeopardize the continued existence” means “to engage in an action that reasonably would be expected, directly, or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species.”³³ If it is determined that the action will jeopardize a species, the biological opinion must list any “reasonable and prudent alternatives” to the proposed action that would not result in jeopardy to the species.³⁴

If the Services determine that the action will not jeopardize a listed species or adversely modify its critical habitat, the biological opinion will contain certain “reasonable and prudent measures” to minimize the incidental take of listed species.³⁵ Incidental take is take that is not the purpose of the otherwise lawful agency action.³⁶ This “no-jeopardy” biological opinion will also contain an ITS laying out the terms and conditions under which incidental take is permitted.³⁷ If the action agency exceeds the level of authorized take in the ITS the action agency must re-initiate consultation.³⁸ Thus, the ITS functions both as a “safe harbor provision immunizing persons from section 9 liability”³⁹ as well as a “trigger”

²⁷ *Id.* § 402.02.

²⁸ *Id.*

²⁹ *Id.* § 402.14(g).

³⁰ *Id.* § 402.02.

³¹ *Id.*

³² *Id.* § 402.14(g).

³³ *Id.* § 402.02.

³⁴ Endangered Species Act of 1973, 16 U.S.C. § 1536(b)(3)(A) (2006).

³⁵ 50 C.F.R. § 402.14(i)(1)(ii) (2009).

³⁶ 16 U.S.C. § 1536(b)(4)(B) (2006).

³⁷ *See* 50 C.F.R. § 402.14(i)(1) (2009) (describing the terms and conditions that must be included in an ITS).

³⁸ *See id.* § 402.16(a).

³⁹ *Ariz. Cattle Growers' Ass'n*, 273 F.3d 1229, 1239 (9th Cir. 2001).

for future consultation if and when the level of take authorized in the ITS is ever exceeded.⁴⁰

In addition to consultation, section 7 also provides that all other federal agencies “shall, in consultation with and with the assistance of the Secretary [of Commerce or the Interior], utilize their authorities in furtherance of the purposes of this chapter by carrying out programs for the conservation of endangered and threatened species”⁴¹ The Act defines “conservation” as “the use of all methods and procedures which are necessary to bring any endangered species or threatened species to the point at which the measures provided pursuant to this chapter are no longer necessary.”⁴²

Section 10 of the Act provides exceptions to section 9’s general prohibition on take.⁴³ This section of the statute allows the Services to issue an incidental take permit (ITP) for the incidental take of endangered and threatened species by non-Federal entities.⁴⁴ To receive an ITP the non-federal entity must submit a habitat conservation plan (HCP) that describes: 1) “the impact which will likely result from such taking”; 2) the “steps the applicant will take to minimize and mitigate such impacts, and the funding that will be available to implement such steps”; 3) the “alternative actions to such taking the applicant considered and the reasons why these alternatives are not being utilized”; and 4) any “other measures the [Services] may require as being necessary or appropriate”⁴⁵ If the Services find that the taking will be incidental, that the applicant has minimized and mitigated the impacts of the taking “to the maximum extent practicable,” that the applicant will ensure adequate funding for the plan, that the taking will not “appreciably reduce the likelihood of the survival and recovery of the species in the wild,” and that any other required measures will be met, then the Services will issue a permit.⁴⁶ The permit must contain terms and conditions to carry out the purpose of section 10, including, but not limited to, any reporting requirements the Services deem necessary for determining whether the applicant is in compliance with its terms and conditions.⁴⁷ The Services may revoke a permit if they find that the permittee is not in compliance with the terms and conditions of the permit.⁴⁸

III. MEASURING TAKE

Section 7 provides an exception to the Act’s take prohibition by allowing federal actions to take listed species in a manner consistent with

⁴⁰ *ONRC v. Allen*, 476 F.3d 1031, 1038 (9th Cir. 2007) (citing *Ariz. Cattle Growers’ Ass’n*, 273 F.3d at 1249).

⁴¹ 16 U.S.C. § 1536(a)(1)(2006).

⁴² *Id.* § 1532(3).

⁴³ *See id.* § 1539(a), (b), (e), (f) (noting that the Secretary may issue take permits or provide one of several exemptions).

⁴⁴ *Id.* § 1539(a)(1)(B).

⁴⁵ *Id.* § 1539(a)(2)(A)(i)–(iv).

⁴⁶ *Id.* § 1539(a)(2)(B)(i)–(v).

⁴⁷ *Id.* § 1539(a)(2)(B).

⁴⁸ *Id.* § 1539(a)(2)(C).

the terms of a biological opinion. The ITS provided for in the biological opinion specifies the impact, i.e., the amount or extent of such incidental taking.⁴⁹ The ITS will often express the amount of permitted incidental take in numeric form.⁵⁰ For instance, a biological opinion on the construction of a municipal landfill permitted the take of fifty-two endangered eastern indigo snakes (*Drymarchon couperi*) during construction and an additional two snakes per year thereafter.⁵¹

Indeed, when the ITS mechanism was added to the Act in 1982, a House Report reveals that Congress expressed a preference that the Services would express the impact of incidental take in numeric form:

Section 7(b)(4) requires the Secretary to specify the impact on such incidental taking on the species. The Committee does not intend that the Secretary will, in every instance, interpret the word 'impact' to be a precise number. Where possible, the impact should be specified in terms of a numerical limitation on the Federal agency or permittee or licensee.⁵²

The supplementary information accompanying the Services' 1986 final rule establishing procedural regulations governing the consultation process under section 7 appears to reflect the view expressed in the House Report.⁵³ During the development of these regulations, the Services received several comments concerning the elements of the ITS.⁵⁴ In responding to these comments, the Services stated, in part:

Because, in some cases, exact numerical limits on the amount of permissible incidental taking will be difficult to determine, the Service may, in accordance with (i)(1)(i), specify the extent of anticipated take that will not violate section 7(a)(2) of the Act. The impact of a particular action may only be predictable in terms of the extent of land or marine area that may be affected. Precise numbers of individuals that may be taken are preferable to descriptions of the extent of disruption and will be provided when they can be computed. However, the Service reserves the flexibility in the rule so that the most appropriate standard for an individual consultation can be used. The Service declines to endorse the use of numerical amounts in all cases over the use of descriptions of extent, because for some species loss of habitat resulting in death or injury to individuals may be more deleterious than the direct loss of a

⁴⁹ 50 C.F.R. § 402.14(i) (2009).

⁵⁰ See *Ariz. Cattle Growers' Ass'n*, 273 F.3d 1229, 1249 (9th Cir. 2001) (citing *Mausolf v. Babbitt*, 125 F.3d 661, 665 (8th Cir. 1997) (restricting take to no more than two wolves); *Fund for Animals v. Rice*, 85 F.3d 535, 540 n.8 (11th Cir. 1996) (setting a numeric limit of fifty-two snakes during construction and an additional two snakes per year thereafter); *Mt. Graham Red Squirrel v. Madigan*, 954 F.2d 1441, 1446 (9th Cir. 1992) (imposing a limit of six red squirrels per year); *Ctr. for Marine Conservation v. Brown*, 917 F. Supp. 1128, 1136 (S.D. Tex. 1996) (limiting take to four hawksbill turtles, four leatherback turtles, ten Kemp's ridley turtles, ten green turtles, or 370 loggerhead turtles).

⁵¹ See *Fund for Animals*, 85 F.3d at 540 n.8.

⁵² H.R. REP. NO. 97-567, at 27 (1982).

⁵³ Interagency Cooperation—Endangered Species Act of 1973, 51 Fed. Reg. 19,926, 19,926 (June 3, 1986) (codified at 50 C.F.R. pt. 402).

⁵⁴ *Id.* at 19,953.

certain number of individuals. Likewise, the Service declines to incorporate into the final rule the comment that would focus take levels on population numbers and recovery plan guidelines, if available.⁵⁵

A couple of important points can be gleaned from the Services' response. First, the Services appear to distinguish the terms "amount" and "extent" as they appear in the provision of the regulations calling for the Services to "provide with the biological opinion a statement concerning incidental take" that "[s]pecifies the impact, i.e., the amount or extent, of such incidental taking."⁵⁶ The Services roughly equate the amount of take to number of members of a species taken (i.e., exact numerical limits) and the extent of take to descriptions of the land or marine area that may be affected or disrupted.⁵⁷ Further, the Services seem to support Congress' preference for specifying the amount of incidental take by stating "[p]recise numbers of individuals that may be taken are preferable to descriptions of the extent of disruption and will be provided when they can be computed."⁵⁸ Thus, the Services appear to adopt the view that preference will be given to specifying the amount of incidental take in numeric form, unless doing so would be difficult to determine, in which case the agencies will specify the extent of anticipated take in terms of habitat loss or disruption that will not violate section 7(a)(2) of the Act (i.e., the prohibition on jeopardizing the continued existence of a species).

Despite the clear congressional preference for specifying the amount of take in numeric form and the Services own regulations reflecting this preference, the Services have opted in many instances to express the extent of take in the form of anticipated losses or changes in species habitat.⁵⁹ These surrogate measures are referred to as "ecological surrogates," "habitat proxies," or "habitat markers."⁶⁰ Consequently, the Services' reliance on such surrogate measures has been the subject of lawsuits and, in several instances, court orders rejecting their use.⁶¹

⁵⁵ *Id.* at 19,953–54.

⁵⁶ 50 C.F.R. § 402.14(i)(1) (1989).

⁵⁷ 51 Fed. Reg. at 19,953–54.

⁵⁸ *Id.* at 19,954.

⁵⁹ *See Nw. Envtl. Def. Ctr.*, 647 F. Supp. 2d 1221, 1237 (D. Or. 2009) (noting that NMFS determined that the take of salmonid species could not be accurately quantified as a number of fish, and thus issued an ITS based on the area of aquatic habitat and square footage of docks); *Swan View Coal*, No. CV 05-64-M-DWM, 2008 WL 5682092, at *11 (D. Mont. Mar. 31, 2008) (noting that FWS used road density and security core habitat as ecological surrogates for the take of grizzly bears); *Pac. Shores Subdivision Cal. Water Dist.*, 538 F. Supp. 2d 242, 257 (D.D.C. Mar. 17, 2008) (noting that FWS was unable to specify the amount of take of the tidewater goby species in numerical form and instead used the species' habitat to define anticipated take).

⁶⁰ *Miccosukee Tribe of Indians of Fla.*, 697 F. Supp. 2d 1324, 1331 (S.D. Fla. 2010).

⁶¹ *See, e.g., id.* at 1341 (finding that the decision to use an ecological surrogate for the incidental take of the Cape Sable Seaside Sparrow was arbitrary and capricious); *Ariz. Cattle Growers' Ass'n*, 273 F.3d 1229, 1249–50 (9th Cir. 2001) (finding that the use of ecological conditions as a surrogate for defining the extent of incidental take is reasonable); *Ctr. for Biological Diversity*, 422 F. Supp. 2d 1115, 1137–38 (N.D. Cal. 2006) (finding that it was arbitrary and capricious for the FWS to fail to specify with greater exactness the amount or extent of take of the desert tortoise); *NRDC v. Evans*, 279 F. Supp. 2d 1129, 1185–88 (N.D. Cal. 2003)

In 2001, the United States Court of Appeals for the Ninth Circuit, in *Arizona Cattle Growers' Association v. U.S. Fish & Wildlife Service*,⁶² first examined the use of an ecological surrogate to measure the extent of take. The court explained that while Congress expressed a preference for a numerical value, it anticipated situations in which take could not be expressed by a precise number.⁶³ In those instances, the court opined, the use of ecological conditions as surrogates for defining the amount or extent of incidental take are acceptable so long as the Services can establish that "no such numerical value could be practically obtained" and that these conditions "are *linked* to the take of the protected species."⁶⁴

At issue in *Arizona Cattle Growers' Association* was an ITS that provided the following condition:

The service concludes that incidental take of loach minnow from the proposed action will be considered to be exceeded if any of the following conditions are met:

[Condition 1] Ecological conditions do not improve under the proposed livestock management. Improving conditions can be defined through improvements in watershed, soil condition, trend and condition of rangelands . . . , riparian conditions . . . , and stream channel conditions . . . within the natural capabilities of the landscape in all pastures on the allotment within the Blue River watershed.⁶⁵

Although the court did not address the issue of whether it was practical to utilize a numeric take limit, it nevertheless found that the use of such an ecological surrogate was improper because it ran afoul of one of the primary reasons for requiring an ITS, which is to provide a trigger for the re-initiation of consultation if the level of take anticipated by the ITS is exceeded. The court found that the ITS failed to articulate how the incidental take of an endangered minnow from certain grazing activities would be exceeded if specific ecological conditions did not improve.⁶⁶ As the court explained,

(finding that defendants acted arbitrarily and capriciously in providing an ecological surrogate in place of numerical estimates of incidental take for various species); *see also* Grand Canyon Trust v. U.S. Bureau of Reclamation, No. CV-07-8164-PHX-DGC, 2010 WL 2643537, at *22-*23 (D. Ariz. June 29, 2010) (rejecting the use of an ecological surrogate in a biological opinion regarding the operation of Glen Canyon Dam where the FWS 1) failed to show why the consultation trigger for adult members of a listed species of fish accurately measured the take of young members of the species, and 2) failed to identify the level at which the take of the young members would become excessive); *South Yuba River Citizens League v. Nat'l Marine Fisheries Serv.*, No. Civ. S-06-2845 LKK/JFM, 2010 WL 2720959, at *29 (E.D. Cal. July 8, 2010) (rejecting the use of ecological surrogates in a biological opinion for certain dam operations that would result in the take of listed fish species because the surrogates failed to reflect other stressors imposed by the project that may cause take, such as entrainment and effects on downstream migration).

⁶² 273 F.3d 1229 (9th Cir. 2001).

⁶³ *Id.* at 1250.

⁶⁴ *Id.* (emphasis added).

⁶⁵ *Id.* at 1249.

⁶⁶ *Id.* at 1250.

ITSs “set forth a ‘trigger’ that, when reached, results in an unacceptable level of incidental take, invalidating the safe harbor provision, and requiring the parties to re-initiate consultation.”⁶⁷ The court invalidated the ITS because its directive to “improve” ecological conditions was too vague.⁶⁸ By failing to establish a link between the activity and the taking of the species, there was no method by which the applicant could have gauged its performance and there was no trigger to reinitiate consultations if and when ecological conditions deteriorated to the point that the activities would result in an unacceptable level of take and the agencies would have to reinitiate consultation.⁶⁹

In 2007, the Ninth Circuit once again addressed the issue of numerical take measures in *Oregon Natural Resources Council v. Allen*.⁷⁰ Following *Arizona Cattle Growers’ Association*, the court invalidated a biological opinion where it also failed to set forth a trigger that would invalidate the safe harbor provision and reinitiate the consultation process.⁷¹ The issue in *Allen* was not that the ITS was vague, but that it was coextensive with the project’s scope which called for a 22,227-acre timber harvest by providing for the take of “all spotted owls associated with the removal and downgrading of 22,227 acres of suitable spotted owl habitat.”⁷² By making the ITS one that both defined and limited the level of take using the parameters of the project, the biological opinion failed to establish a trigger for the reinitiation of consultation.⁷³ The authorized level of take would never be reached until the project was completed and in the event that more spotted owls were taken than previously anticipated, FWS had no means of halting the project or reinitiating consultation.⁷⁴ The court further found that FWS failed to establish that it was “impractical” to define take in numeric form.⁷⁵ While the biological opinion declared that survey data for the spotted owl was out of date and surveys had been discontinued or reduced, the court found such arguments unpersuasive because FWS never stated that it was not possible to update the survey data in order to estimate the number of takings, only that it had not done the surveys.⁷⁶

Two years later and in keeping with *Allen*, the Eleventh Circuit followed suit and invalidated a biological opinion for failing to demonstrate that it was impractical to provide numeric limits for incidental take. In *Miccosukee Tribe of Indians of Florida v. United States*,⁷⁷ FWS prepared a biological opinion on federal water management activities that would

⁶⁷ *Id.* at 1249.

⁶⁸ *Id.* at 1250–51.

⁶⁹ *Id.* at 1249–51.

⁷⁰ 476 F.3d 1031 (9th Cir. 2007).

⁷¹ *Id.* at 1039.

⁷² *Id.*

⁷³ *Id.*

⁷⁴ *Id.*

⁷⁵ *Id.* at 1037–38.

⁷⁶ *Id.* at 1038.

⁷⁷ 566 F.3d 1257 (11th Cir. 2009).

adversely affect three listed bird species.⁷⁸ Instead of providing numeric take limits for these three species, the FWS elected to use habitat impact measurements.⁷⁹ The FWS argued that because the birds were “secretive,” “cryptic” in color, and moved over expansive and remote areas, it was impractical to provide a numerical measure of take.⁸⁰

The court was not persuaded that counting the birds was impractical in light of an administrative record that revealed that scientists for FWS spend a significant amount of time counting these birds and creating yearly population data based on these bird counts.⁸¹ Turning to the 1982 House Report, the court found the Act requires FWS to use specific population data unless it is impractical, and if it is impractical, then FWS must *justify* its decision to express take through habitat impact measurements instead of using actual species head counts.⁸² These cases and others⁸³ demonstrate that courts will honor Congress’ clear intent to measure take numerically in ITs by looking to see if it is indeed impractical for the Services to measure take numerically before they accept the use of an ecological surrogate.

In selecting numeric take measures the Services should carefully consider the consulted-on action’s effects on the species’s population to ensure that the numeric take measure correlates with the anticipated level and source of the take. Courts have indicated that numeric measures may be in the form of the number of members taken or other population data such as a percentage of population loss.⁸⁴ However, numeric measures in the form of percentage of population loss may not provide sufficient protection for some threatened or endangered species. For some species, continued existence depends in part on the preservation of certain subpopulations.⁸⁵ In many instances, these smaller populations may be isolated from other populations, but they serve an important function if, as a result of a catastrophic event (disease, storm events, etc.), the species becomes extirpated from another portion of that species’s range.⁸⁶ In those instances

⁷⁸ *Id.* at 1262–63 & n.1.

⁷⁹ *Id.* at 1272.

⁸⁰ *Id.* at 1275.

⁸¹ *Id.*

⁸² *Id.*

⁸³ See, e.g., *Ctr. for Biological Diversity*, 422 F. Supp. 2d 1115, 1137–38 (N.D. Cal. 2006) (finding that the Service failed to demonstrate that estimating the desert tortoise population was impractical); *NRDC v. Evans*, 279 F. Supp. 2d 1129, 1185–86 (N.D. Cal. 2003) (finding that agency failed to demonstrate that estimating the number of Pacific gray whales and Hawaiian monk seals was impractical).

⁸⁴ See *Miccosukee Tribe of Indians of Fla.*, 566 F.3d at 1274–75 (11th Cir. 2009); *ONRC v. Allen*, 476 F.3d 1031, 1038 (9th Cir. 2007).

⁸⁵ See *Miccosukee Tribe of Indians of Fla.*, 697 F. Supp. 2d at 1327 n.2 (S.D. Fla. 2010) (stating that “Subpopulation A” of the endangered Cape Sable seaside sparrow is considered crucial to the survival of the species because it is separated from the other sparrow populations, which because of their close proximity to one another all could be wiped out by one local catastrophic event); U.S. FISH & WILDLIFE SERV., FLORIDA SCRUB-JAY: *APHELOCOMA COERULESCENS*, 4-261, 4-262 to 4-263, 4-273 (1999), available at <http://www.fws.gov/verobeach/images/pdflibrary/fsja.pdf> (discussing the importance of maintaining certain “core” populations of the Florida scrub-jay).

⁸⁶ See U.S. FISH & WILDLIFE SERV., *supra* note 85, at 4-262 to 4-263, 4-273 to 4-274.

where a consulted-on action would only impact a particular subpopulation or would have a disproportionately significant impact to a particular subpopulation, an ITS that expresses the amount of take in the form of a percentage decline in the species's total population or the loss of a specified number of members across the species's entire range, may not provide sufficient protection to that subpopulation. In these instances, consultation would not be reinitiated unless and until the range-wide trigger is exceeded. In the meantime, the consulted-on action could result in a significant decline or worse, the entire elimination of a subpopulation before the Services reinitiate consultation, thus putting the species at risk of extinction. Thus, in those instances where the substantial loss of members of a particular subpopulation could put the species at risk of jeopardy, the Services should utilize a numeric measure that is specific to the at-risk subpopulation to ensure that consultation will be reinitiated if and when the level of take is exceeded for the members of that subpopulation.⁸⁷

Of course, as Congress recognized, it is not always practical to provide a headcount of the number of species a particular project will take:

The Committee recognizes, however, that it may not be possible for the Secretary to specify a number in every instance. For example, it may not be possible to determine the number of eggs of an endangered or threatened fish which will be sucked into a power plant when water is used as a cooling mechanism. The Committee intends only that such numbers be established where possible.⁸⁸

Thus, in some instances ecological surrogates may be more protective, as they would likely trigger the reinitiation of consultation sooner than the use of a numeric trigger, which depends upon the discovery or identification of dead, injured, or harassed members of a species before consultation can be

⁸⁷ While the Act requires the Services to base jeopardy determinations on whether the consulted-on action is likely to jeopardize the species as a whole, the use of a numeric take measure that is focused on protecting a specific subpopulation would not be inconsistent with this mandate. In *Rock Creek Alliance v. U.S. Fish & Wildlife Serv.*, 390 F. Supp. 2d 993 (D. Mont. 2005), plaintiffs challenged a biological opinion's no jeopardy finding for a distinct population segment of the bull trout. *Id.* at 1000. The court held that the Service was required to consider how the loss of a subpopulation of bull trout could affect the current status of a distinct population segment as a whole and whether this in turn would jeopardize the continued existence of the species. *Id.* at 1001, 1010. Thus, it would appear that if the Service is required in its biological opinions to evaluate how the loss of a subpopulation could affect the current status of the species as a whole, it could use an ITS that is specific to an at risk subpopulation where the loss of members of that subpopulation could risk jeopardizing the species as a whole. In addition, where most, but not all, members of a species that would be taken as a result of the consulted-on action are part of a specific subpopulation, the Service may be able to utilize two sets of numeric measures to account for the loss of individuals in the subpopulation as well as additional members of the species outside that subpopulation. Further, where the use of numeric measures is not practical, ecological surrogates could be narrowly tailored to account for the specific impacts the project will have on that subpopulation.

⁸⁸ H.R. REP. NO. 97-567, at 27 (1982).

reinitiated.⁸⁹ Moreover, the use of ecological surrogates would be appropriate where it is impractical to express take as a change in the species population due to the species size,⁹⁰ distribution,⁹¹ difficulty of detection,⁹² or lack of scientific data.⁹³

The use of ecological surrogates beyond these unique situations, however, poses a number of risks. Whereas the use of a numeric trigger requires immediate reinitiation of consultation once the project takes more than a specified number of individuals of a species, ecological surrogates do not trigger the reinitiation of consultation unless and until certain habitat disturbance indicators appear.⁹⁴ The latter scenario presents a significant risk in that an unacceptable level of take may occur before these habitat disturbance indicators appear, and the project could jeopardize the species before consultation is ever reinitiated by the Services.⁹⁵

⁸⁹ Because the Act defines “take” broadly to include actions that increase the likelihood of injuring a listed species by significantly disrupting normal behavioral patterns (i.e., breeding, feeding or sheltering), 50 C.F.R. § 17.3 (2009), an inherent risk in every consulted-on action is that the Service may not be able to identify every animal that is taken by a consulted-on action. This fact alone, however, does not render the use of a numeric measure impractical, and it should not be a reason for the Service to ignore Congress’s intent and justify the use of an ecological surrogate in every instance.

⁹⁰ See *Pac. Shores Subdivision Cal. Water Dist.*, 538 F. Supp. 2d 242, 257 (D.D.C. 2008) (upholding the use of an ecological surrogate where it was impractical to determine the population of the two-inch long tidewater goby); *City of Santa Clarita v. U.S. Dep’t of Interior*, No. CV02-00697, 2006 WL 4743970, at *13 (C.D. Cal. Jan. 30, 2006) (upholding the use of an ecological surrogate for the unarmored threespine stickleback because the fish’s small size and difficulty in detection made it impractical to determine its population).

⁹¹ See *Nw. Env’tl. Def. Ctr.*, 647 F. Supp. 2d 1221, 1237–38 (D. Or. 2009) (upholding the use of an ecological surrogate where the variable distribution of listed salmon made it impractical to provide a numerical measure); see also *Swan View Coal*, No. CV 05-64-M-DWM, 2008 WL 5682092, at *13 (D. Mont. Mar. 31, 2008) (upholding the use of ecological surrogates for grizzly bears); *Natural Res. Def. Council, Inc. v. Gutierrez*, No. C-07-04771 EDL, 2008 WL 360852, at *28–*29 (N.D. Cal. Feb. 6, 2008) (upholding the use of ecological surrogates for sea turtles).

⁹² See *City of Santa Clarita*, 2006 WL 4743970, at *13.

⁹³ See *Heartwood v. Kempthorne*, No. 1:05-cv-313, 2007 WL 1795296, at *19–*20 (S.D. Ohio June 19, 2007) (finding that the lack of information on Indiana bats made it impractical to providing a numerical measure of incidental take). The purported lack of population data in many instances, however, is hard to reconcile with section 4’s mandate that the Services perform status reviews for all listed species. See *Endangered Species Act of 1973*, 16 U.S.C. § 1533(c)(2)(A) (2006). This issue aside, there may be instances where habitat markers are a better measure of anticipated take. As the Service remarked in the supplementary information accompanying the final rule implementing section 7 of the Act, “The Service declines to endorse the use of numerical amounts in all cases . . . because for some species loss of habitat resulting in death or injury to individuals may be more deleterious than the direct loss of a certain number of individuals.” *Interagency Cooperation—Endangered Species Act of 1973*, 51 Fed. Reg. 19,926, 19,954 (June 3, 1986).

⁹⁴ See *City of Santa Clarita*, 2006 WL 4743970, at *4, *12–*15 (C.D. Cal. 2006).

⁹⁵ See *Miccosukee Tribe of Indians of Fla.*, 697 F. Supp. 2d 1324, 1337–38 (S.D. Fla. 2010). Contrary to the district court’s opinion in *Miccosukee Tribe of Indians of Florida*, however, numeric measures in the form of changes in species population (rather than numeric caps) could in some instances have similar consequences. Identifying changes in population may be dependent upon yearly surveys and it may take FWS a year or more to determine whether the population has decreased to the point that consultation must be re-initiated. *Id.* at 1332.

There are additional risks associated with the use of ecological surrogates. For one, the chosen ecological surrogate may not always accurately measure the level of allowable take because it focuses only on a certain segment of the affected population and fails to consider other segments. In *Grand Canyon Trust v. U.S. Bureau of Reclamation*,⁹⁶ the United States District Court for the District of Arizona recently rejected the use of an ecological surrogate in a biological opinion regarding the operation of Glen Canyon Dam, where FWS failed to show why the consultation trigger for adult members of a listed species of fish accurately measured the take of young members of the species and failed to identify the level at which the take of the young members would become excessive.⁹⁷

Another risk in relying on ecological surrogates to measure take is that they may not sufficiently account for all of the project's impacts on the species. For instance in another recent case, *South Yuba River Citizens League v. National Marine Fisheries Service*,⁹⁸ the United States District Court for the District of Eastern California rejected the use of certain ecological surrogates to specify the extent of take caused by two dams and related water diversions because they failed to account for all of the project's effects or "stressors" to three listed fish species.⁹⁹ In *South Yuba River Citizens League*, NMFS's biological opinion identified a number of stressors to the three listed fish species caused by the project, including "impairments to migration, effects on flow regimes, effects on spawning habitat, and entrainment and impingement at diversions."¹⁰⁰ The ITS employed four ecological surrogates in place of a numerical limit on take.¹⁰¹ These four surrogates, however, only correlated with some of the project's major impacts and did not reflect other stressors, including entrainment (the diversion of fish from the river to a diversion channel) and the Daguerre Point Dam's effects on downstream migration.¹⁰² The court concluded that the surrogates must reflect the take caused by the project and NMFS could not point to anything in the record that demonstrated that no such take would occur as a result of these other unaccounted for stressors.¹⁰³ Thus, the ITS failed to demonstrate the necessary link between the surrogates and take.¹⁰⁴

Where it is practical to quantify take by number or population estimates, quantification is not only required but is also the best approach for several reasons. Quantification provides a clearly defined cap on the number of species that may be taken as a result of a project without jeopardizing the species and a trigger for the agencies to re-initiate consultation once the actual number of species taken exceeds that allowed by the ITS. Quantifying the amount of take avoids the Services' reliance on

⁹⁶ No. CV-07-8164-PHX-DGC, 2010 WL 2643537 (D. Az. June 29, 2010).

⁹⁷ *Id.* at *23.

⁹⁸ No. Civ. S-06-2845 LKK/JFM, 2010 WL 2720959 (E.D. Cal. July 8, 2010).

⁹⁹ *Id.* at *1-*2, *23.

¹⁰⁰ *Id.*

¹⁰¹ *Id.* at *28-*29.

¹⁰² *Id.* at *12, *29.

¹⁰³ *Id.* at *29.

¹⁰⁴ *Id.*

vague statements regarding the extent of incidental take, such as the statement invalidated by the court in *Arizona Cattle Growers' Association*.¹⁰⁵ The use of numeric measures also eliminates many of the risks associated with the use of ecological surrogates: the ITS does not provide an accurate indication of when the level of take would be excessive,¹⁰⁶ the ITS does not correlate with all of the project's effects on a listed species,¹⁰⁷ and the ITS is not restrictive enough so as to avoid being coextensive with the scope of the project.¹⁰⁸ Because a numeric measure provides a clear, identifiable bottom line as to the amount of take that will be permitted, it avoids the often difficult task of establishing the required link or nexus between the activity and the taking of the species, which is required if the agency is to rely on an ecological surrogate to measure take.¹⁰⁹

The increased use of numeric measures has benefits that go beyond those expressed by these decisions. As explained in the next Part, because numeric take measures are predicated on the availability of species counts, population estimates, or both, requiring the Services to quantify the amount of take in biological opinions where such data is available provides the much needed impetus and incentive for action agencies to utilize that data and monitor a project's impacts to listed species.¹¹⁰ By monitoring take, the Services are better able to determine whether the project's impacts have exceeded the level of anticipated take expressed in the ITS, thus providing a scientific basis for requiring the reinitiation of consultation. In those instances where the agencies must reinitiate consultation, monitoring reports help inform the agencies of the specific activities that are resulting in a greater than anticipated level of take and the additional measures that may need to be implemented to avoid or minimize additional take in the future.¹¹¹

Further, by requiring the Services to quantify anticipated take in biological opinions, the Services may move closer to the development and implementation of a cumulative take tracking system. A cumulative take tracking system would track the specific number of members of a species taken over time, the amount of habitat lost as a result of past actions, or both.¹¹² Such a system would both inform and modify agency decision making, which in turn, may result in more effective protections to listed species over time.

IV. MONITORING TAKE

While numeric measures provide a clearly defined trigger to reinitiate consultation, the only way for the action agency to know whether it must

¹⁰⁵ *Ariz. Cattle Growers' Ass'n*, 273 F.3d 1229, 1250 (9th Cir. 2001).

¹⁰⁶ *See Grand Canyon Trust*, 2010 WL 2643537, at *23 (D. Ariz. June 29, 2010).

¹⁰⁷ *See South Yuba River Citizens League*, 2010 WL 2720959, at *29 (E.D. Cal. July 8, 2010).

¹⁰⁸ *See ONRC v. Allen*, 476 F.3d 1031, 1039 (9th Cir. 2007).

¹⁰⁹ *See id.* at 1037–38.

¹¹⁰ *See infra* Part IV.

¹¹¹ *See* GAO REP. NO. GAO-09-550, *supra* note 10, at 15.

¹¹² *See id.* at 16–17.

reinitiate consultation is by monitoring the amount of incidental take that results from a project, which is required by the Act's implementing regulations.¹¹³ The regulations instruct the action agency to monitor the impacts of incidental take by reporting "the progress of the action and its impact on the species to the Service."¹¹⁴ These monitoring reports may provide information on 1) the effects resulting from the agency action, 2) information on actual take compared to the anticipated take level provided for in the biological opinion, 3) whether the incidental take level provided for in the biological opinion has been exceeded, and 4) the effectiveness of measures designed to minimize incidental take.¹¹⁵ Numeric measures appear to provide the clearest assessment of anticipated take for the purposes of monitoring take.

Unfortunately, despite the Act's requirement that the action agencies monitor incidental take, a 2009 GAO report reveals that the extent to which FWS actually requires ongoing monitoring in its biological opinions varies from action to action and even where it is required, the agency lacks complete monitoring information for many of its formal consultations.¹¹⁶ The same appears to be true for NMFS.¹¹⁷ Depending on the action, FWS may require "monitoring reports on a one-time basis; on a regular, reoccurring basis; or not at all."¹¹⁸ Often times, FWS does not require any reports where FWS staff expects that the action will have a minor impact on listed species.¹¹⁹

With respect to the monitoring reports that are actually prepared, each of FWS's field offices relies on its biologists to keep track of these reports.¹²⁰ The extent to which monitoring is tracked, therefore, varies by biologist.¹²¹ As a result, the GAO found that in sixty-four consultation files where monitoring reports were due, FWS biologists could not fully account for monitoring reports in forty of these files.¹²² In fact, no required monitoring reports were available for twenty-four of the sixty-four consultation files reviewed.¹²³ In

¹¹³ 50 C.F.R. § 402.14(i)(3) (2009). In the very recent case, *Wild Fish Conservancy v. Salazar*, No. 09-35531, 2010 WL 4948477 (9th Cir. Dec. 7, 2010), the U.S. Fish and Wildlife Service prepared a biological opinion that set a numerical cap of twenty threatened bull trout that would be injured by a fish hatchery project. *Id.* at *9. The incidental take statement, however, did not require the agency to monitor and report the actual number of bull trout harmed by the project. *Id.* at *15. The Court invalidated the ITS finding that even though the Service set a "clear numerical cap" for the take of bull trout, "a numerical cap is useful only insofar as the action agency is capable of quantifying take to determine whether the trigger has been met." *Id.* at *16 (citations omitted).

¹¹⁴ *Wild Fish Conservancy*, 2010 WL 4948477, at *16.

¹¹⁵ See GAO REP. NO. GAO-09-550, *supra* note 10, at 8. U.S. FISH & WILDLIFE SERV. & NAT'L MARINE FISHERIES SERV., CONSULTATION HANDBOOK: PROCEDURES FOR CONDUCTING CONSULTATION AND CONFERENCE ACTIVITIES UNDER SECTION 7 OF THE ENDANGERED SPECIES ACT 9 (1998).

¹¹⁶ *Id.* at 11.

¹¹⁷ See Rohlf, *supra* note 10, at 142.

¹¹⁸ GAO REP. NO. GAO-09-550, *supra* note 10, at 11.

¹¹⁹ *Id.*

¹²⁰ *Id.* at 11-12.

¹²¹ *Id.* at 12.

¹²² *Id.*

¹²³ *Id.* at 12, fig.3.

some of these cases where monitoring reports were unavailable, the action agency had simply failed to prepare a monitoring report.¹²⁴ FWS biologists acknowledged that such cases were not uncommon.¹²⁵

FWS's failure to require monitoring reports in many instances and the lack of a comprehensive method of tracking these monitoring reports present several problems. In some cases, an action FWS anticipates will be relatively minor may ultimately result in a significant impact to the species. By not requiring a monitoring report for even these seemingly minor projects, there may be no way for FWS to require the action agency to reinstate consultation if and when the project results in a more significant impact to species than originally anticipated. Perhaps a greater concern, however, is that in those instances where monitoring reports are required, the action agency's failure to prepare these reports may leave FWS with the inability to assess the action's affects on listed species and the inability to determine whether the level of anticipated take provided for in the ITS has been exceeded.¹²⁶ The action agency's failure to submit monitoring reports and the failure of FWS to track these reports can have profound impacts to listed species. In one instance, the GAO Report found that when the action agency had submitted a monitoring report after having failed to consistently prepare monitoring reports over a ten-year period, it reported that the species's population that had once numbered 1400 was not found at all in the action area.¹²⁷ Obviously, by that time it was too late for FWS to do anything about the situation.¹²⁸ Conversely, without monitoring reports to keep FWS informed of the project's actual impacts to a species, FWS runs the risk of overestimating the project's actual impacts if fewer members of a species than anticipated are actually taken as a result of the project.¹²⁹ This could unfairly burden the action agency, applicant, or both by requiring unnecessary project modifications and protective measures.¹³⁰

Aside from the risk that certain actions are resulting in a level of take that exceeds the level provided for in the ITS for that action, the lack of a comprehensive monitoring system is problematic for several other reasons. As the GAO explains, monitoring reports provide FWS with information on the status and health of a species in a given area.¹³¹ Without these reports, FWS may lack the necessary data and information to accurately define the environmental baseline. As noted earlier, the environmental baseline is the starting point for each biological opinion¹³² and an incomplete baseline jeopardizes the integrity of the entire consultation process. Further, monitoring reports provide a means of verifying the biological opinion's assessment of the action's impacts and determining whether certain

¹²⁴ *Id.* at 13.

¹²⁵ *Id.*

¹²⁶ *See id.* at 15.

¹²⁷ *Id.*

¹²⁸ *Id.*

¹²⁹ *Id.*

¹³⁰ *Id.* at 15–16.

¹³¹ *Id.* at 9.

¹³² *See supra* text accompanying notes 26–34; 50 C.F.R. § 402.02 (2009).

protective measures need to be modified in future consultations on similar actions.¹³³ Without a comprehensive means of tracking monitoring reports, FWS may be unaware of changed circumstances or unforeseen impacts that, if identified, would require FWS to recommend necessary changes or modifications to minimize the impact posed by that project and similar projects in the future. Lastly, a complete inventory of monitoring reports can also assist FWS in assessing the cumulative effect that federal actions are having on a listed species.¹³⁴ FWS would then be in a better situation to consider these cumulative effects before authorizing future actions occurring within the same action area.

Clearly, a more comprehensive and unified approach is needed to track monitoring reports, as the current approach to preparing and tracking monitoring reports is inconsistent and highly fragmented.¹³⁵ Currently, FWS relies on each of the various field office biologists (usually the author of the biological opinion) to keep informed of the reporting requirements in each biological opinion.¹³⁶ These biologists are also largely responsible for tracking any associated monitoring reports.¹³⁷ The FWS defends these practices based on a variety of agency constraints.¹³⁸ Citing demanding workloads and competing priorities, some FWS biologists contend that they must take a risk-management approach in deciding which monitoring reports to track based on which actions they believe are likely to have greater impacts on listed species than other actions.¹³⁹ Too often, however, FWS has cited heavy workloads, inadequate funding, and competing priorities in defense of its position that it need not fulfill its responsibilities under the Act.¹⁴⁰ For instance, FWS routinely cites agency workloads and higher priorities as reasons for not designating critical habitat¹⁴¹ even though the agency has a duty to designate critical habitat unless doing so is not prudent or determinable.¹⁴² Similarly, given the Act's mandate that FWS must

¹³³ GAO REP. NO. GAO-09-550, *supra* note 10, at 9; U.S. FISH & WILDLIFE SERV. & NAT'L MARINE FISHERIES SERV., CONSULTATION HANDBOOK: PROCEDURES FOR CONDUCTING CONSULTATION AND CONFERENCE ACTIVITIES UNDER SECTION 7 OF THE ENDANGERED SPECIES ACT 9-1 (1998).

¹³⁴ GAO REP. NO. GAO-09-550, *supra* note 10, at 9.

¹³⁵ *Id.* at 11.

¹³⁶ *Id.* at 11–12.

¹³⁷ *Id.* at 12.

¹³⁸ *Id.* at 13.

¹³⁹ *Id.*

¹⁴⁰ *See* *Forest Guardians v. Babbitt*, 174 F.3d 1178, 1192 (10th Cir. 1999); *Ctr. for Biological Diversity v. Norton*, 304 F. Supp. 2d 1174, 1180–82 (D. Ariz. 2003).

¹⁴¹ *See* *Ctr. for Biological Diversity v. Norton*, 304 F. Supp. 2d at 1180–82. The court noted the U.S. Fish & Wildlife Service has an “open” and “unabashed” view that designating critical habitat is a “low priority” but explained that Congress believed that designating critical habitat was “of equal or more importance” than simply classifying a species as either threatened or endangered. *Id.* at 1182. Accordingly, the court ruled that the mandatory language of the ESA does not allow the heavy workload of the agency to excuse compliance. *Id.*; *see also* *Forest Guardians*, 174 F.3d at 1192 (rejecting the Service's claim that it need not comply with statutory mandate due to “inadequate resources”).

¹⁴² *See* 50 C.F.R. § 424.12(a)(1)–(2) (2009).

conserve *all* listed species,¹⁴³ FWS should not take a risk assessment approach in deciding which monitoring reports to track based on which actions it believes are likely to have the greatest impacts on listed species. Moreover, whether FWS can actually determine whether a particular action will have a greater impact on a listed species than another action depends in part on the availability of baseline data and information available to FWS in the first place. Thus, without a program to track monitoring reports and cumulative take, it is not clear whether FWS can accurately prioritize which actions should be subject to more rigorous monitoring efforts.

FWS also cites its reliance on more informal means to collect information as a basis for not adopting a more systematic approach to tracking monitoring reports.¹⁴⁴ While more informal approaches to collect information such as routine conversations with action agency officials and site visits may be productive short-term measures to monitoring an action's effects on listed species, the long-term benefits of such measures would necessarily depend upon an ongoing working relationship between a particular FWS biologist and action agency official.¹⁴⁵ Given the aforementioned issues of employee turnover, not to mention retirement, it is unclear whether this approach is sustainable in the long run.¹⁴⁶

For these reasons, it is important that the Services require action agencies to prepare monitoring reports for all of its biological opinions and develop a comprehensive and systematic method for tracking these reports. As courts demand that the Services quantify the level of take permitted in biological opinions, the tracking of monitoring reports is even more important as it helps ensure that these numeric caps are actually respected and that reinitiation of consultation will actually occur if and when the anticipated level of take is exceeded. This in turn, would help ensure the protection of listed species throughout the life of a particular project as well as better inform the decision making process in future consultations by providing the agencies with the necessary information and data to determine which protective measures the agencies should be implementing.¹⁴⁷ Part VI will explore how this can be achieved.

¹⁴³ See *Sierra Club v. Glickman*, 156 F.3d 606, 615 (5th Cir. 1998) (finding that Congress intended for each federal agency to conserve each of the species listed under the Act (quoting 16 U.S.C. § 1532(3) (2000))).

¹⁴⁴ GAO REP. NO. GAO-09-550, *supra* note 10, at 13.

¹⁴⁵ See *id.* at 13–14.

¹⁴⁶ See *id.* at 24 (“As when monitoring reports are missing, staff turnover can mean the institutional loss of knowledge . . . and this lack of information could in turn result in a miscalculation of the environmental baseline for future consultations and an insufficient analysis of the total effects on the species in the action area.”).

¹⁴⁷ See U.S. FISH & WILDLIFE SERV. & NAT'L MARINE FISHERIES SERV., *supra* note 133, at 9-1 (recognizing the benefits afforded by project monitoring by stating, “monitoring programs should be integral elements of all interagency consultations concluding that an action may adversely affect listed species or critical habitat”).

V. TRACKING CUMULATIVE TAKE

The Services' Consultation Handbook (the Handbook), which establishes the procedures for conducting section 7 consultations, calls for tracking the collective effects consultations have on species and their habitats.¹⁴⁸ The Handbook notes that a tracking system makes it easier for the Services to evaluate the cumulative effects of various actions over time and determine when the level of incidental take reaches the point of jeopardy or adverse modification of a species's habitat.¹⁴⁹ The Handbook calls for FWS to establish a national, computerized information system that collects and maintains data for both formal and informal consultations.¹⁵⁰ The national database is to be maintained and updated by the regional offices, with each regional office maintaining their own database until the national database becomes operational.¹⁵¹ A comprehensive set of fields and values for each consulted-on action forms the core of this system.¹⁵² These fields include the species's name; the action agency; the applicant; the state, county, and locality the action occurs in; the conclusion on how that particular action will effect the species or its habitat (e.g. jeopardy, no jeopardy); the reasonable and prudent alternatives and measures undertaken; terms and conditions; take type and level; and information on what is required in terms of monitoring reports.¹⁵³ With respect to the type of take, the Handbook calls for FWS to identify the quantity or extent of incidental take anticipated, either in terms of the numbers of individual species or acreages of habitat type.¹⁵⁴ Despite FWS calling for the development of a systematic method for tracking the cumulative take of species in its 1996 Consultation Handbook, the GAO Report reveals that nearly fifteen years later, FWS still lacks such a system.¹⁵⁵ It appears that NMFS also lacks such a system.¹⁵⁶

The Services' failures to implement such systems present significant problems.¹⁵⁷ As Professor Rohlf explains, given the finite level of incidental take that can occur before any additional take would jeopardize the species, it is critical for the agencies to know how much take they have already permitted, and how many members of a species remain, before they can decide whether they should permit any additional incidental take of the species.¹⁵⁸ The GAO Report concludes that, without a method for tracking cumulative take, FWS may not have an accurate picture of the effects all of

¹⁴⁸ *Id.* at 9-2.

¹⁴⁹ *Id.*

¹⁵⁰ *Id.*

¹⁵¹ *Id.*

¹⁵² *Id.*

¹⁵³ *Id.* at 9-3 to 9-6.

¹⁵⁴ *Id.* at 9-5.

¹⁵⁵ GAO REP. NO. GAO-09-550, *supra* note 10, at 16.

¹⁵⁶ See Rohlf, *supra* note 10, at 157.

¹⁵⁷ *Id.* at 157-58; see also GAO REP. NO. GAO-09-550, *supra* note 10, at 23.

¹⁵⁸ Rohlf, *supra* note 10, at 157.

the consulted-on actions have had on a species.¹⁵⁹ Thus, in some instances, a project could potentially jeopardize a listed species despite the agency's determination that it would not.¹⁶⁰

Aside from the biological problems that stem from the lack of a cumulative take tracking system, the lack of such a system poses legal difficulties for the Services.¹⁶¹ The GAO Report found that a formal system for tracking the cumulative take is only available for three of the 497 species listed in the western United States.¹⁶² Though this is a poignant illustration of the magnitude of the agency's failure, equally telling is what it reveals as the impetus for FWS developing tracking systems for all three species. In at least two of the three instances litigation drove the development of cumulative take tracking systems.¹⁶³

In 2002, a cumulative take tracking system was developed for the entire range of the northern spotted owl (*Strix occidentalis caurina*) in response to a lawsuit challenging six biological opinions concerning the effects timber harvests would have on the owl.¹⁶⁴ The suit challenged, in part, how FWS defined the "environmental baseline" in these biological opinions.¹⁶⁵ As discussed earlier, the environmental baseline is in essence the environmental conditions before the implementation of the project.¹⁶⁶ Plaintiffs alleged that the biological opinions were invalid because they failed to sufficiently analyze the current status of the spotted owl and failed to take into account past incidental take, which when combined with other potential actions, cumulatively impacted the species.¹⁶⁷ Although the Ninth Circuit ultimately sided with FWS on the validity of the biological opinion,¹⁶⁸ FWS developed a take tracking database for the entire range of the spotted owl shortly after the suit was filed.¹⁶⁹ The database was designed to track the effects of multiple actions by enabling biologists to enter both anticipated take information and actual take information once the action was completed.¹⁷⁰ This would enable FWS to generate reports of cumulative take

¹⁵⁹ GAO REP. NO. GAO-09-550, *supra* note 10, at 23.

¹⁶⁰ On the other hand, without a system to account for both the cumulative anticipated and *actual* take of a particular species, the Service may be overestimating the effects certain actions are having on the species and not taking appropriate on the ground measures to account for these discrepancies. *Id.* at 15–16.

¹⁶¹ Rohlf, *supra* note 10, at 157–58; GAO REP. NO. GAO-09-550, *supra* note 10, at 15–16.

¹⁶² GAO REP. NO. GAO-09-550, *supra* note 10, at 18.

¹⁶³ *Id.* at 18–19.

¹⁶⁴ *Id.* at 18 & n.20.

¹⁶⁵ *Id.* at 18; *see also* Rohlf, *supra* note 10, at 157–58 & n.172.

¹⁶⁶ *See supra* notes 26–28 and accompanying text. *See also* 50 C.F.R. § 402.02 (2009).

¹⁶⁷ *See* GAO REP. NO. GAO-09-550, *supra* note 10, at 18 & n.20; Rohlf, *supra* note 10, at 158, n.172 (citing Gifford Pinchot Task Force v. U.S. Fish & Wildlife Serv., No. C00-5462-FDB (D. Or.) and noting that the basis for plaintiff's claims was that the FWS had "no idea of the number of owl takings it has previously authorized, nor how many owls have actually been taken.").

¹⁶⁸ *See* Gifford Pinchot Task Force v. U.S. Fish & Wildlife Serv., 378 F.3d 1059, 1077 (9th Cir. 2004).

¹⁶⁹ GAO REP. NO. GAO-09-550, *supra* note 10, at 18 & n.20.

¹⁷⁰ *Id.*

for the owl both across its range and within smaller geographic regions.¹⁷¹ Clearly, one of the primary benefits of developing a tracking database such as this one is to provide FWS with a more informed assessment of the status of the species and the amount of take already permitted before it issues future biological opinions.¹⁷²

Within the same database developed for the northern spotted owl, FWS developed a similar but less comprehensive system for the marbled murrelet (*Brachyramphus marmoratus*), a bird that shares similar nesting habitats with the owl.¹⁷³ As with the owl, both anticipated and actual cumulative take information on the species can be generated for the murrelet even though it does not include the southernmost region of the murrelet's range.¹⁷⁴

In 2004, FWS developed a tracking system for the full range of a third species, the bull trout (*Salvelinus confluentus*). This tracking system was also prompted by litigation. In *Rock Creek Alliance v. U.S. Fish & Wildlife Service*,¹⁷⁵ plaintiffs alleged that a biological opinion for a proposed mining project was defective because it failed to consider the mining project's cumulative impacts to a distinct population segment of the bull trout.¹⁷⁶ FWS concluded that because the project would impact a relatively insignificant subpopulation of the bull trout, it would pose no real threat to this larger, distinct population segment, even if the project ultimately resulted in the complete destruction of the subpopulation.¹⁷⁷

The court found that even though FWS's regulations limited the scope of the cumulative effects analysis to the action area, FWS was required to evaluate the status of the species across its entire range.¹⁷⁸ In light of the fact that bull trout from the subpopulation were not totally isolated from other populations of bull trout, there was the potential that members from the subpopulation could contribute to the genetic diversity of populations downstream.¹⁷⁹ Unfortunately, FWS had not updated information on the status of the species since listing it six years earlier and the information that was provided in the record revealed that the status of species was indeed "marginal." This, coupled with the fact that FWS had approved several other projects despite its concern for the loss of subpopulations, persuaded the court to find that there was no support for FWS's contention that the project would not impact the larger population of the species.¹⁸⁰ The court held that FWS was required to consider how the loss of this subpopulation could affect the current status of the population as a whole and whether this in turn would jeopardize the continued existence of the species.¹⁸¹

¹⁷¹ *Id.*

¹⁷² *See* Rohlf, *supra* note 10, at 142, 158.

¹⁷³ GAO REP. NO. GAO-09-550, *supra* note 10, at 19.

¹⁷⁴ *Id.*

¹⁷⁵ 390 F. Supp. 2d 993 (D. Mont. 2005).

¹⁷⁶ *Id.* at 1001.

¹⁷⁷ *Id.* at 1010.

¹⁷⁸ *Id.*

¹⁷⁹ *Id.*

¹⁸⁰ *Id.*

¹⁸¹ *See id.* at 1010.

This case, as well as others,¹⁸² illustrates that FWS's failure to determine the cumulative take of a species prior to permitting additional take of that species casts doubt upon the accuracy of the environmental baseline and FWS's analysis of the action's effects and, in turn, subjects the agency to liability under the Act.¹⁸³ By developing such a system, however, FWS would provide additional scientific support for its decisions and likely reduce the chances of their actions being found arbitrary and capricious.¹⁸⁴ It would thus appear to be in FWS's interest to develop a systematic means of tracking cumulative take for all listed species.¹⁸⁵

While a cumulative take tracking system would help ensure that future biological opinions are more biologically and legally sound, this is not to say that the Services' reliance on a tracking system to inform its section 7 determinations is not without its limitations. To determine whether a specific project will jeopardize the continued existence of a species the Services must ask whether the project's effects, when added to the "environmental baseline," will appreciably reduce the survival and recovery of the species as a whole.¹⁸⁶ The environmental baseline only includes the past and present impacts of all activities *in the action area* and the anticipated impacts of all consulted-on federal projects *in the action area*.¹⁸⁷ Clearly, the past impacts of activities in the action area would include the cumulative take of the species within the action area. To this extent, the information gathered from a cumulative take tracking system would help define the environmental baseline and better inform FWS of how the anticipated level of take resulting from the consulted-on action, when added to the amount of cumulative take occurring within the action area, would affect the species.¹⁸⁸

¹⁸² See generally Rohlf, *supra* note 10, at 147–48 & nn.134–44. Rohlf explains that courts have cited the Service's inability to "determine how many members of that species they have authorized to be killed or injured" as a problem in striking down section 7 decisions by the Services. *Id.* at 157–58 (discussing *Defenders of Wildlife v. Babbitt*, 130 F. Supp. 2d 121 (D.D.C. 2001); *Pac. Coast Fed'n of Fishermen's Ass'n, Inc. v. Nat'l Marine Fisheries Serv.*, 265 F.3d 1028 (9th Cir. 2001); *Greenpeace v. Nat'l Marine Fisheries Serv.*, 80 F. Supp. 2d 1137 (W.D. Wash. 2000); and associated statutes and regulations). Rohlf explains that courts have cited the Service's inability to "determine how many members of that species they have authorized to be killed or injured" as a problem in striking down section 7 decisions by the Services. *Id.* at 157–58.

¹⁸³ *Id.* at 158; GAO REP. NO. GAO-09-550, *supra* note 10, at 23.

¹⁸⁴ The issuance of a biological opinion is a "final agency action" reviewable under the Administrative Procedures Act (APA). See *Bennett v. Spear*, 520 U.S. 154, 178 (1997). Under the APA, a court may set aside an agency action if found to be "arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law." 5 U.S.C. § 706(2)(A) (2006).

¹⁸⁵ See GAO REP. NO. GAO-09-550, *supra* note 10, at 23; see also Rohlf, *supra* note 10, at 158.

¹⁸⁶ Rohlf, *supra* note 10, at 155.

¹⁸⁷ *Id.* at 156.

¹⁸⁸ Given that FWS is required to analyze the activities and impacts that constitute the environmental baseline, and not merely recite them, it would follow that FWS would similarly analyze the cumulative take of those actions within the action area and the combined effect this level of take would have on the species when coupled with the level of take that would likely result from the consulted-on action. See *Nat'l Wildlife Fed'n v. Souza*, No. 08-14115-CIV, 2009 WL 3667070, at *6 (S.D. Fla. Oct. 23, 2009) (citing *Defenders of Wildlife v. Babbitt*, 130 F. Supp. 2d 121, 127–28 (D.D.C. 2001) (invalidating biological opinions where FWS failed to analyze the

Beyond that, in many instances, the Services' reliance on cumulative take in the decision-making process, as well as its usefulness, would appear to end there because the Services are precluded from analyzing the effects of actions occurring outside the action area to determine whether the specific action will jeopardize the species as a whole.¹⁸⁹ Thus, it would appear that in many situations consideration of cumulative take in the overall jeopardy analysis would have limited value.¹⁹⁰

This is not necessarily the case. Where the action area represents only a small portion of the species's larger geographic area, the species can still be significantly impacted by multiple actions occurring within a discrete portion of its range. As cases such as *Rock Creek Alliance* illustrate, the unique geological makeup of a particular region can lead to a concentrated effort on the part of industry to develop the region's resources.¹⁹¹ The intensity and frequency of these activities may eventually have the cumulative effect of extirpating the species from that particular geographic region, thus confining the species to an even smaller distribution or range and making it that much harder for the species to recover. This may be especially true for species such as the threatened Florida scrub-jay, which is found exclusively in peninsular Florida's scrub communities.¹⁹² For decades scrub habitat has been the focus of significant development pressure because its elevated, well-drained, sandy soils make it well suited for construction.¹⁹³ In fact, with more than two-thirds of the original scrub land in Florida already converted, scrub lands have been developed faster than any other ecosystem type in Florida.¹⁹⁴ FWS has identified five scrub-jay subpopulations with three of these subpopulations being "core populations" because they contain more than half of the state's remaining scrub-jays.¹⁹⁵ The loss of just one of these core populations from development or other human activities could have significant impacts to the species as a whole. For instance, as FWS's South Florida Multi-Species Recovery Plan warns, "any further declines in the size and distribution of [the Lake Wales Ridge] population places the Florida scrub-jay at a greater risk of extinction in South Florida."¹⁹⁶ Without a cumulative take tracking system in place for species such as the scrub-jay,¹⁹⁷ FWS may be unable to determine just when

projects and impacts occurring with the environmental baseline and the impacts these projects would have when combined with the consulted-on action)).

¹⁸⁹ See Rohlf, *supra* note 10, at 156.

¹⁹⁰ See *id.*

¹⁹¹ See *Rock Creek Alliance*, 390 F. Supp. 2d 993, 997 (D. Mont. 2005).

¹⁹² U.S. FISH & WILDLIFE SERV., *supra* note 85, at 4-262.

¹⁹³ See Inst. of Food & Agric. Scis., Univ. of Fla., Scrub, <http://www.sfrc.ufl.edu/4h/Ecosystems/Scrub/scrub.html> (last visited Feb. 13, 2011).

¹⁹⁴ *Id.*

¹⁹⁵ U.S. FISH & WILDLIFE SERV., *supra* note 85, at 4-263.

¹⁹⁶ *Id.* at 4-273.

¹⁹⁷ Although it is true that the Florida scrub-jay's recovery plan calls for the update of a statewide survey and species monitoring, see *id.* at 4-283, 4-284, 4-287, and nongovernmental organizations such as the Nature Conservancy have provided valuable information in the form of annual bird counts, see The Nature Conservancy, Jay Watch: Monitoring Florida's Only Endemic Bird, <http://www.nature.org/wherewework/northamerica/states/florida/>

one of these core populations is at risk of collapsing, thus potentially jeopardizing the continued existence of the species as a whole.¹⁹⁸

On the other hand, the use of a cumulative take tracking system would also be beneficial where the action area consists of a significant portion of the species's range. As habitat loss, degradation, and fragmentation continue to be the biggest threat facing endangered species, many more species will be relegated to small, marginal patches of habitat.¹⁹⁹ In these instances, the action area may be coextensive with the entire species's range and the preservation of every remaining acre of the species habitat is critically important. Thus, for those species that occur within a small geographic range, they may be more sensitive and vulnerable to the cumulative effects of multiple actions occurring within their range. In this instance, a tracking system that accounts for the number of remaining members or acres of habitat may just make the difference in providing FWS with the information necessary to prevent a future action from jeopardizing the continued existence of a species.²⁰⁰

volunteer/art7303.html (last visited Nov. 10, 2010), these surveys do not identify or track the take resulting from the numerous habitat altering activities permitted by FWS each year. Thus, FWS may not be in position to identify which activities, in which geographic areas, are resulting in the greatest loss of members of the species.

¹⁹⁸ It is further worth noting that even where the action area would appear to consist of an area that is a smaller portion of the species range, FWS cannot define the action area too narrowly so as to avoid assessing the project's impacts to other areas affected by the action. *Native Ecosystems Council v. Dombeck*, 304 F.3d 886, 901–03 (9th Cir. 2002) (invalidating a biological assessment of a timber sale's impacts to threatened grizzly bears where the FWS's delineation of the "action area" failed to include areas where displaced bears may wander, including a nearby sheep grazing allotment wherein grizzlies could be at risk of predatory control measures); *Nat'l Wildlife Fed'n v. Nat'l Marine Fisheries Serv.*, 254 F. Supp. 2d 1196, 1212 (D. Or. 2003) (invalidating a biological opinion where NMFS improperly limited the scope of the action area to just the immediate area of the project and failed to consider how certain dam operations would both directly and indirectly affect listed salmon, even if doing so resulted in the action area encompassing the *entire range* of the listed species).

¹⁹⁹ See Katherine Simmon Yagerman, *Protecting Critical Habitat Under the Federal Endangered Species Act*, 20 ENVTL. L. 811, 822–27 (1990) (discussing the threat to species posed by habitat fragmentation).

²⁰⁰ The GAO Report suggests that priority should be given first to developing a cumulative take tracking program to wide-ranging species, in the belief that it would be the most beneficial for these species. GAO REP. NO. GAO-09-550, *supra* note 10, at 26. The one example the GAO Report cites in support of its position that wide-ranging species would receive the greatest benefits is the Point Arena Mountain Beaver, which occurs within a 24 square mile area. *Id.* at 22–23. The GAO Report appears to conclude that species such as the beaver that occupy a relatively small geographic area would not necessarily benefit from a cumulative take tracking system as would other more wide-ranging species. *Id.* at 22. It seems to base this conclusion on the ability of FWS to adequately account for the species status and the types of actions affecting the population. *Id.* But as the GAO Report notes, only three actions likely to adversely affect the beaver (thus requiring formal consultation) have occurred over the last five years. *Id.* Two of the projects were aimed at benefiting the beaver; a third "did not anticipate any take." *Id.* In this instance it is not so much the size of the species range but rather the low number of activities affecting the beaver activities that reduces the need to track cumulative take. Thus, it would appear that the frequency and intensity of activities occurring within a species' small geographic range, and not the size of the species range, should be a factor in the prioritization of developing tracking systems for listed species.

The value in developing a cumulative take tracking system lies in its ability to better inform the Services and action agencies of the collective effects their actions are having on a particular species, to alert the Services of the perils of approving additional actions in those instances where it would jeopardize the species, and to provide the Services with additional scientific support to take whatever steps are necessary to prevent future projects from jeopardizing the species. By relying on the data collected from its cumulative take databases to inform its decision making, the Services may also preserve the public's trust that the agency's determinations are supported by the best available science.²⁰¹

FWS biologists have recognized the need for a more systematic method, but citing limited resources and demanding workloads,²⁰² biologists have taken a case-by-case approach to tracking cumulative take.²⁰³ For instance, FWS has initiated several informal tracking programs for such species as the Canada lynx (*Lynx canadensis*), Desert tortoise (*Gopherus agassizii*), Mexican spotted owl (*Strix occidentalis lucida*), Pecos bluntnose shiner (*Notropis simus pecosensis*), Pima pineapple cactus (*Coryphantha scheeri* var. *robustispina*), and Preble's meadow jumping mouse (*Zapus hudsonius preblei*).²⁰⁴ These efforts consist of electronic spreadsheets maintained by FWS in several field offices.²⁰⁵ The scope of each of these programs varies as some tracking programs only track anticipated take provided for in formal consultations in a particular state while the tracking program for the Mexican spotted owl tracks both anticipated and actual take throughout the species's range in a four-state region.²⁰⁶ Some of these programs track take

²⁰¹ See Endangered Species Act of 1973, 16 U.S.C. § 1536(a)(2) (2006) (requiring each agency to use the best scientific and commercial data available in fulfilling the consultation requirements of section 7). Unfortunately, the public's confidence that the Service is actually using the best available science in its decision making may be waning. See Holly Doremus, *The Purposes, Effects, and Future of the Endangered Species Act's Best Available Science Mandate*, 34 ENVTL. L. 397, 427 (2004) ("[I]n the context of the ESA, public trust in the supposedly scientific decisions that implement the ESA is demonstrably fraying.").

²⁰² While FWS biologists may cite budgetary issues and workloads as reasons for inaction, see, e.g., GAO REP. NO. GAO-09-550, *supra* note 10, at 23, the agency puts itself in a difficult and potentially untenable position if it chooses not to develop a comprehensive method for tracking cumulative take for these reasons. While the Act does not expressly require FWS to track cumulative take, FWS's failure to do so when such information may be readily accessible for certain species may subject FWS to continued litigation challenging FWS's failure to utilize the best available science to accurately account for the environmental baseline in consulted-on actions. See, e.g., Wash. Toxics Coal. v. U.S. Fish and Wildlife Serv., 457 F. Supp. 2d 1158, 1182 (W.D. Wash. 2006) (finding that FWS's failure to utilize the best available science was an abdication of its responsibilities under the ESA). In these instances, FWS may find it difficult to defend its failure based on budgetary constraints, workloads and competing agency priorities. See *Forest Guardians*, 174 F.3d 1178, 1192 (10th Cir. 1999); Ctr. for Biological Diversity v. Norton, 304 F. Supp. 2d 1174, 1182-83 (D. Ariz. 2003); Sierra Club v. Lujan, No. MO-91-CA-069, 1993 WL 151353, at *11 (W.D. Tex. Jan. 30, 1993) (citing Northern Spotted Owl v. Lujan, 758 F. Supp. 621, 629 (W.D. Wash. 1991)) (rejecting Service's argument that in light of budget constraints it need not develop and implement a species recovery plan).

²⁰³ See, e.g., GAO REP. NO. GAO-09-550, *supra* note 10, at 23.

²⁰⁴ *Id.* at 21 tbl.2.

²⁰⁵ *Id.*

²⁰⁶ *Id.*

both in terms of the number of members of a species affected and the amount of habitat modified.²⁰⁷ The program for the Pima pineapple cactus also tracks the number of conservation mitigation measures purchased to offset the loss of habitat as a result of consulted-on actions.²⁰⁸

Despite FWS's best efforts, these case-by-case approaches to tracking cumulative take are clearly inadequate. They represent just a handful of the more than 1300 species currently listed under the Act²⁰⁹ and provide an incomplete assessment of the status and future for many of the species they are intended to track. As the GAO Report recommends, a more systematic means of tracking cumulative take is needed,²¹⁰ and the following Part will discuss how the Services, with the help of action agencies, and even the states, can develop and implement an integrated approach to tracking monitoring reports and cumulative take.

VI. THE SERVICES SHOULD TAKE A COMPREHENSIVE AND INTEGRATED APPROACH TO MONITORING AND TRACKING TAKE

While courts have demanded more from the Services in how the agencies describe the extent to which the consulted actions affect listed species,²¹¹ these more rigorous requirements have limited value if, at the end of the day, there are no means to monitor the amount of take resulting from each consultation and no means to track the amount of cumulative take resulting from all previously authorized actions. Essentially, without a means of keeping track of just how much has been given away, how much remains, and what steps must be taken to conserve the species, quantifying the amount of take permitted by each action does little more than catalogue the eventual demise of the species. Given the agencies' duty to conserve all listed species,²¹² a term synonymous with recovery,²¹³ the Act arguably requires more. Accordingly, as the GAO recommends in its 2009 Report, the Services should develop systematic programs to track monitoring reports and track cumulative take.²¹⁴ In response to the GAO's reports, the Department of Interior has concurred with the report's findings and its recommendations.²¹⁵

Consistent with GAO recommendations, the Services should develop a method for systematically tracking all required monitoring reports.²¹⁶ The Services should also develop a national database that enables the systematic tracking of cumulative take for all species affected by formal

²⁰⁷ *Id.*

²⁰⁸ *Id.*

²⁰⁹ U.S. Fish & Wildlife Serv., Species Reports: General Statistics for Endangered Species, http://ecos.fws.gov/tess_public/TessStatReport (last visited Feb. 13, 2011).

²¹⁰ GAO REP. NO. GAO-09-550, *supra* note 10, at 27.

²¹¹ *See* cases cited *supra* notes 6-8 and accompanying text.

²¹² *See* Endangered Species Act of 1973, 16 U.S.C. § 1536(a)(1) (2006).

²¹³ *See id.* § 1532(3).

²¹⁴ GAO REP. NO. GAO-09-550, *supra* note 10, at 27.

²¹⁵ *Id.* at 33.

²¹⁶ *See id.* at 27.

consultations.²¹⁷ This tracking system should incorporate all the elements of some of the species specific databases currently used by the Services, including information on both anticipated and actual take throughout the species's range,²¹⁸ the number of members of a species affected and the amount of habitat modified,²¹⁹ and (where applicable) the number of conservation mitigation measures purchased to offset the loss of habitat as a result of consulted-on actions.²²⁰

To develop, implement, and maintain these systems effectively, however, a more collective effort is necessary. To this end, the Services should utilize several different provisions of the Act to harness the support of federal agencies, states, and private entities to compile the necessary data to create and maintain a comprehensive and systematic means of tracking monitoring reports and cumulative take. By utilizing the Act's recovery planning,²²¹ habitat conservation planning,²²² conservation program,²²³ and federal-state cooperation agreement provisions²²⁴ to create and maintain systematic tracking programs, action agencies, states, and private entities would share in the responsibility of compiling the data necessary to develop and implement these tracking programs. Utilizing these provisions would not only facilitate the development, implementation, and maintenance of comprehensive monitoring and tracking programs, but also inform the Services' decision making—and administration of the Act as a whole—by making species monitoring and cumulative take important considerations throughout the Act's many provisions.

A. The Services Should Make Tracking of Monitoring Reports and Cumulative Take a Priority in All Species Recovery Plans

Section 4 of the Act directs the Secretaries of the Interior and Commerce (through the Services) to develop and implement recovery plans for the conservation and survival of endangered species and threatened species.²²⁵ In developing and implementing each recovery plan, the Services must incorporate “a description of such site-specific management actions as may be necessary to achieve the plan's goal for the conservation and survival of the species.”²²⁶ A species is “conserved” once it has reached the point where the measures provided by the Act are no longer necessary.²²⁷

Many recovery plans call for the Services to determine the population and distribution of species populations as well as monitor those

²¹⁷ See *id.*; U.S. FISH & WILDLIFE SERV. & NAT'L MARINE FISHERIES SERV., *supra* note 133, at 9-2.

²¹⁸ See *supra* notes 197-98 (discussing how tracking could apply to scrub jays).

²¹⁹ See *supra* notes 197-98.

²²⁰ See *supra* notes 197-98.

²²¹ Endangered Species Act of 1973, 16 U.S.C. § 1533(f) (2006).

²²² *Id.* § 1533.

²²³ *Id.* § 1536(a).

²²⁴ *Id.* § 1535.

²²⁵ *Id.* § 1533(f).

²²⁶ *Id.* § 1533(f)(1)(B)(i).

²²⁷ *Id.* § 1532(3).

populations.²²⁸ Indeed, section 4 of the Act calls for the Services to review the status of all species populations every five years.²²⁹ Yet, many of these same plans do not call for the tracking of the monitoring reports required by each biological opinion or the tracking of cumulative take resulting from these consulted-on actions.²³⁰ The conservation of listed species depends in part on informed decisions by the Services that consulted-on actions will not jeopardize listed species. Yet without a commitment from the Services that they will actually track monitoring reports and cumulative take, there are fewer assurances that the Services have accurately calculated the environmental baseline of a particular species prior to determining whether the action will or will not jeopardize that species. Given that recovery is the overarching goal of the Act, it is imperative that the Services develop a program to track monitoring reports and cumulative take and to this end, that every species recovery plan make the tracking of monitoring reports and the cumulative take a required element. By making the tracking of cumulative take a required action in each recovery plan the Services reaffirm their commitment to developing and implementing a systematic program to track monitoring reports and cumulative take and using the best available science to inform their decision making throughout the consultation process.

B. Action Agencies Should Make the Tracking of Monitoring Reports and Cumulative Take Resulting from Their Actions Part of Their Section 7 Conservation Programs

Action agencies must recognize that it is their responsibility to prepare monitoring reports²³¹ and as such, they should make tracking of monitoring reports and cumulative take resulting from all of their consulted-on actions an integral part of their endangered species conservation programs. Section 7(a)(1) of the Act provides that all federal agencies “shall, in consultation with and with the assistance of the Secretary, utilize their authorities in furtherance of the purposes of this chapter by carrying out programs for the conservation of endangered species and threatened species”²³²

What section 7(a)(1) requires of federal agencies is an evolving issue for the courts. The Ninth Circuit has held that the Services have discretion in

²²⁸ See, e.g., U.S. FISH & WILDLIFE SERV., *supra* note 85, at 4-262, 4-268 to 4-272.

²²⁹ 16 U.S.C. § 1533(c)(2)(A) (2006). Despite this mandate, the Services have not determined the population status of all listed species. Daniel J. Rohlf, *Section 4 of the Endangered Species Act: Top Ten Issues for the Next Thirty Years*, 34 ENVTL. L. 483, 545 (2004).

²³⁰ See U.S. FISH & WILDLIFE SERV., *supra* note 85. *But see* U.S. FISH & WILDLIFE SERV., FLORIDA PANTHER RECOVERY PLAN: 3RD REVISION at 102 (2008) (directing FWS to “[t]rack permits, especially incidental take and compensation received, issued through Federal and State regulatory programs to determine the impacts on panthers of landscape and land use changes”).

²³¹ See GAO REP. NO. GAO-09-550, *supra* note 10, at 14 (expressing the opinion of some FWS biologists that it is not their job to “police” action agencies to ensure their compliance with reporting requirements).

²³² 16 U.S.C. § 1536(a)(1) (2006).

how to best fulfill the conservation mandate under section 7(a)(1).²³³ The Fifth Circuit in *Sierra Club v. Glickman*, determined that section 7(a)(1) imposes an affirmative duty on each federal agency to conserve *every* listed species.²³⁴ Most recently, the Eleventh Circuit determined that agencies may have discretion in selecting a particular program to conserve but they must in fact carry out a program to conserve.²³⁵ Total inaction is not an option.²³⁶

In view of the fact that section 7(a)(1) requires federal agencies, minimally, to develop conservation programs, it would make sense that the starting point of any conservation program would be an assessment of the effects past and present agency actions are having on protected species so as to inform the agencies of what measures must be taken to conserve species. To this end, action agencies should make the preparation and tracking of monitoring reports and the tracking of the cumulative take resulting from their consulted-on actions part of their conservation programs. This can be accomplished by requiring as part of each agency's conservation program a commitment by the action agency to 1) prepare and track monitoring reports for each endangered species that is the subject of every consulted-on action, and 2) develop an agency administered cumulative take tracking program for the species subject to agency consultations. The Services, in turn, could then compile and incorporate the data generated from each agency's tracking programs into a national database.

The development of a national database coupled with a commitment by each agency to make the tracking of monitoring reports a central component of agency conservation programs would help allay the Services' concerns about developing a system on their own while enabling action agencies to take a more proactive role in species protection. By delegating tracking responsibilities to action agencies and making them part of each agency's conservation program, action agencies would likely become better informed of how their actions are affecting listed species. This could be particularly useful for certain routinely consulted-on actions that are consistently impacting a particular species or group of species within a particular ecosystem. The data collected from these reports would provide the agencies with the necessary information to determine which actions are having the greatest impact, which species are most affected by these actions, and which geographic regions are experiencing the greatest impacts. For instance, a review of biological opinions prepared by FWS on actions undertaken by the U.S. Army Corps of Engineers (Corps) in South Florida over the past several years, reveals that species such as the wood stork (*Mycteria Americana*) and eastern indigo snake that frequent wetland areas,

²³³ See *Pyramid Lake Paiute Tribe of Indians v. U.S. Dep't of the Navy*, 898 F.2d 1410, 1418 (9th Cir. 1990) (citing *Carson-Truckee Water Conservancy Dist. v. Clark*, 741 F.2d 257, 262 (9th Cir. 1984)).

²³⁴ *Sierra Club v. Glickman*, 156 F.3d 606, 616 (5th Cir. 1998).

²³⁵ *Florida Key Deer v. Paulison*, 522 F.3d 1133, 1147 (11th Cir. 2008).

²³⁶ *Id.* at 1146-47 (citing *Sierra Club v. Glickman*, 156 F.3d at 617-18; *Nat'l Wildlife Fed'n v. Norton*, 332 F. Supp. 2d 170, 187 (D.D.C. 2004); *Defenders of Wildlife v. U.S. Dep't of Interior*, 354 F. Supp. 2d 1156, 1174 (D. Or. 2005)).

have been the subject of numerous consultations for wetland fill projects requiring permits from the Corps under the Clean Water Act's²³⁷ section 404.²³⁸ If the Corps shared in the responsibility of tracking the cumulative take these actions were having on such species, it would likely inform agency decision making and provide the Corps with the necessary supporting scientific data to modify future actions in the permitting process so as to avoid or minimize additional future impacts to listed species.²³⁹ This would not only assist action agencies such as the Corps in developing strong, effective conservation programs under section 7(a)(1) but would also perhaps help ensure that the resulting consultation decisions by the Services incorporate the most protective and scientifically defensible reasonable and prudent measures²⁴⁰ to conserve these species.

*C. The Services Should Incorporate Cumulative Take Information
from Section 10 Incidental Take Permits into
Their National Cumulative Take Tracking Program*

To receive a section 10 ITP, applicants must prepare a satisfactory HCP detailing the impacts that are likely to result from their actions and how such impacts will be minimized and mitigated.²⁴¹ To determine the likely effects of a project on listed species, the HCP must quantify anticipated take levels²⁴² either in terms of the number of animals taken or where such information is unknown or indeterminable, in terms of a habitat proxy such as the loss of habitat acres or units.²⁴³ The Act's implementing regulations also require that an HCP provide for measures to monitor the impacts of the taking resulting from the proposed action.²⁴⁴ The applicant and the Services share in the responsibility of monitoring project impacts.²⁴⁵ Further, because the issuance of an ITP is a federal action, the Services must perform an intra-agency or internal consultation under section 7 to ensure that the issuance

²³⁷ Federal Water Pollution Control Act, 33 U.S.C. §§ 1251–1387 (2006).

²³⁸ See S. Fla. Ecological Servs. Office, U.S. Fish & Wildlife Serv., Biological Opinions, <http://www.fws.gov/verobeach/index.cfm?Method=BiologicalOpinion.Home> (last visited Feb. 13, 2011).

²³⁹ See U.S. FISH & WILDLIFE SERV. & NAT'L MARINE FISHERIES SERV., *supra* note 133, at 4-48 to 4-50 (discussing the inclusion of minor project changes as "reasonable and prudent measures" in biological opinions to minimize impacts of incidental take).

²⁴⁰ See 50 C.F.R. § 402.14(i)(ii) (2009) (requiring FWS to specify the reasonable and prudent measures that are necessary or appropriate to minimize such impact).

²⁴¹ See Endangered Species Act of 1973, 16 U.S.C. § 1539(a)(2)(A) (2006).

²⁴² See U.S. FISH & WILDLIFE SERV., U.S. DEPT. OF THE INTERIOR ET AL., HABITAT CONSERVATION PLANNING AND INCIDENTAL TAKE PERMIT PROCESSING HANDBOOK 3-10 (1996), *available at* http://www.nmfs.noaa.gov/pr/pdfs/laws/hcp_handbook.pdf.

²⁴³ *Id.* at 3-14; see also *Sierra Club v. Babbitt*, 15 F. Supp. 2d 1274, 1284–85 (S.D. Ala. 1998) (instructing the FWS to gather current inventory, trend, and viability data before it determines whether the issuance of two ITPs would have a significant impact on a listed species).

²⁴⁴ U.S. FISH & WILDLIFE SERV., U.S. DEPT. OF THE INTERIOR ET AL., *supra* note 242, at 3-26 (citing 50 C.F.R. §§ 17.22(b)(1)(iii)(B), 222.307(b)(5)(iii) (2009)).

²⁴⁵ *Id.* at 3-27.

of the ITP will also not likely jeopardize the species.²⁴⁶ In recent years, the number of applicants receiving ITPs under section 10 has increased significantly.²⁴⁷ So too have the scope and size of the accompanying habitat conservation plans increased. For instance, FWS recently finalized an “Umbrella” HCP for the Florida scrub-jay, which covers certain land disturbing activities across a thirty-four county area in Florida.²⁴⁸

In view of the Services issuing an increasing number of ITPs, many of which cover a large geographic area, there is the potential for a significant level of cumulative take resulting from these actions.²⁴⁹ Given the Services’ corresponding duties under section 7 to ensure that these actions will not jeopardize listed species, it is imperative that the Services utilize the take information obtained through the required monitoring to determine how these projects are affecting listed species. When working with the non-federal applicants, the Services should compile the take information collected from these monitoring reports and incorporate this data into their tracking programs for monitoring reports. The amount or extent of cumulative take resulting from these ITPs can then be integrated into the cumulative take tracking system for all species. This will help ensure that the Services have a complete and accurate picture of how all consulted-on actions, not just those involving federal actors, are impacting all listed species.

D. The Services Should Utilize Section 6 to Enlist the Assistance of States to Track Cumulative Take

The Services should look to the states as wildlife conservation partners for their assistance in tracking cumulative take. The Services could enter into section 6 Cooperative Agreements with states to obtain additional assistance. Section 6 of the Act enables the Services to “enter into a cooperative agreement . . . with any State which establishes and maintains an adequate and active program for the conservation of endangered species and threatened species.”²⁵⁰ States with qualifying programs can receive federal funding for the development and implementation of management plans, scientific research, monitoring activities, and public education and outreach efforts.²⁵¹ Several states already have entered into cooperative

²⁴⁶ See *id.* at 3-15; 16 U.S.C. § 1536(a)(2) (2006).

²⁴⁷ See Karin P. Sheldon, *Habitat Conservation Planning: Addressing the Achilles Heel of the Endangered Species Act*, 6 N.Y.U. ENVTL. L.J. 279, 301 (1998).

²⁴⁸ See U.S. FISH & WILDLIFE SERV., FLORIDA SCRUB-JAY UMBRELLA HABITAT CONSERVATION PLAN AND ENVIRONMENTAL ASSESSMENT 2 (2007), available at http://www.fws.gov/northflorida/Scrub-Jays/Docs/Umbrella/20100800_ver_FSJ_Umbrella_HCP_EA.pdf.

²⁴⁹ For instance, the Florida scrub-jay Umbrella HCP anticipates and permits a loss of nearly 15,000 acres of scrub-jay habitat over the seven-year period the HCP is in effect. See *id.* at 26.

²⁵⁰ 16 U.S.C. § 1535(c)(1) (2006).

²⁵¹ See *id.* § 1535(d)(1); NAT’L OCEANIC & ATMOSPHERIC ADMIN. ET AL., COOPERATIVE CONSERVATION WITH THE STATES: THE ENDANGERED SPECIES ACT SECTION 6 PROGRAM REPORT FY 2003-2008 at 3 (2009), available at <http://www.nmfs.noaa.gov/pr/pdfs/conservation/section6report.pdf> (discussing a variety of funded projects administered under the NMFS’s Protected Species Cooperative Conservation Grant Program under section 6 of the ESA).

agreements with the Services.²⁵² Through these cooperative agreements, state agencies may be able to assist the Services in tracking the cumulative take of a particular species as a result of consulted-on actions. For instance, the North Carolina Division of Marine Fisheries obtained a section 6 grant to conduct a by-catch monitoring program for gillnet fisheries within estuarine waters and established a fishermen logbook reporting system.²⁵³ Using these data, the state agency was able to estimate total incidental take (lethal and nonlethal) of federally listed sea turtles as a result of these actions.²⁵⁴ It would appear that similar agreements could be developed to enlist the support of state agencies in determining the cumulative take of a wide variety of species and actions.

Another example of an agency the Services could make a cooperative agreement with is the Florida Fish and Wildlife Conservation Commission (FWC), which plays an active and important role in the conservation of the federally endangered Florida panther.²⁵⁵ FWC has performed a variety of research, monitoring and management activities for the panther since 1976.²⁵⁶ This has included an extensive radio collaring and tracking program.²⁵⁷ Since 1990 these activities have been funded through a state trust fund generated by revenues from state license plate sales totally nearly \$40 million through 2004.²⁵⁸ FWC also plays an important role in project planning by commenting on potential impacts to panther habitat.²⁵⁹ Further, FWC has developed a state-of-the-art GIS-based habitat mapping tool that is used in the planning and permitting process for projects impacting listed species.²⁶⁰ All of these programs are consistent with FWC's state constitutional and statutory responsibilities of monitoring the status and health of wildlife species and their habitat.²⁶¹ It would appear that given FWC's extensive and long-time involvement in panther protection that FWC would be well positioned to assist the FWS in tracking the cumulative take of this species as a result of consulted-on projects.

²⁵² NAT'L OCEANIC & ATMOSPHERIC ADMIN. ET AL., *supra* note 251, at 1 (noting that 14 states and U.S. territories have cooperative agreements with NMFS). Florida, for instance, has entered into cooperative agreements with both FWS and NMFS. *See* Cooperative Agreement Between the United States Department of the Interior, Fish & Wildlife Service and Florida Fish and Wildlife Conservation Commission for the Conservation of Endangered and Threatened Fish and Wildlife (2001) (on file with author); Cooperative Agreement Between the United States Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service and the Florida Fish and Wildlife Conservation Commission for the Conservation of Threatened and Endangered Species (2009) (on file with author).

²⁵³ *See* NAT'L OCEANIC & ATMOSPHERIC ADMIN. ET AL., *supra* note 251, at 24.

²⁵⁴ *Id.*

²⁵⁵ Fla. Fish & Wildlife Conservation Comm'n, Panther Net, <http://www.floridapanther.net.org> (last visited Nov. 30, 2010).

²⁵⁶ *See* U.S. FISH & WILDLIFE SERV., *supra* note 230, at 66.

²⁵⁷ *Id.*

²⁵⁸ *Id.* at 68.

²⁵⁹ *Id.* at 60.

²⁶⁰ *See* MARK ENDRIES ET AL., FLA. FISH & WILDLIFE CONSERVATION COMM'N, THE INTEGRATED WILDLIFE HABITAT RANKING SYSTEM 2008 at 2 (2008), *available at* <http://ocean.floridamarine.org/iwhrs/IWHRS%202008%20report.pdf>.

²⁶¹ FLA. STAT. § 20.331(7)(2) (2008).

Such an arrangement could be accomplished through the development of a “project agreement” that would enable state wildlife agencies to develop a cumulative take tracking program for a particular species.²⁶² Under the ESA’s implementing regulations, the Secretary of the Interior and states may enter into specific project agreements following the establishment of a section 6 Cooperative Agreement.²⁶³ These project agreements provide for federal funding of state administered projects aimed at species conservation.²⁶⁴ The information obtained from these state initiated tracking efforts could then be collected and incorporated into a larger, national tracking program administered by the Services. Enlisting the assistance of states may not only help facilitate and expedite the development of a more systematic cumulative take tracking program for federally listed species but also assist states in identifying and assessing actions that may be contributing to the decline of state listed species that share the same habitats as federally listed species.²⁶⁵ Thus, the tracking of cumulative take of federally listed species may indirectly benefit state imperiled species and provide an opportunity to prevent the listing of these species under the ESA.²⁶⁶

States could provide additional cumulative take tracking assistance by utilizing species habitat mapping programs and databases. Over the past decade, several states have developed GIS-based landscape mapping tools that evaluate the use of various habitats by listed species.²⁶⁷ Many of these programs provide valuable information on land cover and species-specific data.²⁶⁸ For instance, Florida’s Wildlife Habitat Ranking System not only ranks the state’s landscape based on the habitat needs of listed species but includes specific information on listed species locations, species richness, and data on the spatial complexity and variability of a number of different species habitats.²⁶⁹ These mapping programs assist state wildlife agencies in assessing the potential impacts of specific projects to listed species and their habitats.²⁷⁰ Some of these programs are updated to provide the latest and most accurate species information.²⁷¹ These programs have the potential to assist federal wildlife authorities in tracking the cumulative take of listed

²⁶² See 50 C.F.R. § 81.6 (2009).

²⁶³ See *id.*

²⁶⁴ *Id.*

²⁶⁵ As an example, the federally-listed Florida scrub-jay shares the same scrub habitat as the state listed gopher tortoise. U.S. FISH & WILDLIFE SERV., *supra* note 85, at 4-270. As a result, consulted-on actions that affect the scrub-jay may also impact the tortoise. Information collected on the cumulative take of the scrub-jay, such as in the form of habitat loss, could provide valuable information on the cumulative loss of habitat for the tortoise. This information, in turn can be used by state agencies to take more protective measures to prevent these species from becoming listed under the ESA in the future.

²⁶⁶ *Id.*

²⁶⁷ See Jason Totoiu, *Building a Better State Endangered Species Act: An Integrated Approach Toward Recovery*, 40 *Envtl. L. Rep. (Envtl. Law Inst.)* 10,299, 10,312 (Mar. 2010) (citation omitted) (providing a comprehensive assessment of state habitat mapping initiatives).

²⁶⁸ Totoiu, *supra* note 267, at 10,312.

²⁶⁹ ENDRIES ET AL., *supra* note 260, at 4.

²⁷⁰ See Totoiu, *supra* note 267, at 10,312.

²⁷¹ See ENDRIES ET AL., *supra* note 260, at 2.

species, particularly where such take is expressed in the form of acceptable habitat proxies that are linked the take of listed species. State agencies can utilize these programs to track the quality, quantity, and location of habitat disturbance linked to the take of listed species by many consulted-on actions. By working in conjunction with state wildlife officials, the Services may be able to develop a more complete picture of the status of listed species and track the cumulative loss of these species and their habitats over time.

VII. CONCLUSION

The recent rulings by the Ninth and Eleventh Circuit in *Allen*²⁷² and *Miccosukee Tribe of Indians of Florida*,²⁷³ respectively, honor Congress's preference for specifying in every formal consultation decision, to the extent practical, the number of members of a listed species that the Services anticipate will be taken as a result of the consulted-on action. These numeric take measures help provide the necessary impetus and incentive for action agencies and the Services to monitor and track the cumulative take of listed species so as to better inform agency decision-making. As the Services currently lack a systematic means of tracking monitoring reports and cumulative take, it is imperative that the Services take action consistent with the Government Accountability Office's 2009 Report and develop both a comprehensive system for monitoring take and a system for tracking cumulative take. To develop, maintain and implement such programs, the Services should take an integrated approach and utilize several different provisions of the act to harness federal, state and private assistance. An integrated, interagency approach to monitoring and tracking cumulative take would likely yield a more comprehensive, informed, and proactive approach to species conservation.

²⁷² *ONRC v. Allen*, 476 F.3d 1031, 1038 (9th Cir. 2007).

²⁷³ *Miccosukee Tribe of Indians of Fla.*, 566 F.3d 1257, 1272–75 (11th Cir. 2009).