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50 CFR Part 17

Endangered and Threatened Wildlife and Plants; Removal of the Louisiana Black Bear From the Federal List of Endangered and Threatened Wildlife and Removal of Similarity-of-Appearance Protections for the American Black Bear; Proposed Rule

DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

[Docket No. FWS–R4–ES–2015–0014; FXES11130900000C2–156–FF09E32000]

RIN 1018–BA44

Endangered and Threatened Wildlife and Plants; Removal of the Louisiana Black Bear From the Federal List of Endangered and Threatened Wildlife and Removal of Similarity-of-Appearance Protections for the American Black Bear

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Proposed rule; availability of draft post-delisting monitoring plan.

SUMMARY: We, the U.S. Fish and Wildlife Service (Service), propose to remove the Louisiana black bear (*Ursus americanus luteolus)* from the Federal List of Endangered and Threatened Wildlife (List) due to recovery. This proposed action is based on a thorough review of the best available scientific and commercial data, which indicate that this subspecies has recovered and no longer meets the definition of a threatened or endangered species under the Endangered Species Act of 1973, as amended (Act). Our review of the status of this subspecies shows that the threats to the subspecies have been eliminated or reduced, and adequate regulatory mechanisms exist. The subspecies is now viable over the next 100 years with sufficient protected habitat to support breeding and movement of individuals between subpopulations so that the subspecies is not currently, and is not likely to again become, a threatened species within the foreseeable future in all or a significant portion of its range. We also propose to remove from the List the American black bear, which is listed within the historic range of the Louisiana black bear due to similarity of appearance. Finally, we announce the availability of a draft post-delisting monitoring (PDM) plan for the Louisiana black bear. We seek information, data, and comments from the public regarding this proposal to delist this subspecies and on the draft PDM plan.

DATES: To allow us adequate time to consider your comments on this proposed rule, we must receive your comments on or before July 20, 2015. We will hold two public hearings on this proposed rule. The first hearing will be in Tallulah, LA on June 23, 2015, from 7:00 to 9:00 p.m. (Central Time). The second hearing will be in Baton Rouge, LA on June 25, 2015, from 7:00 to 9:00 p.m. (Central Time) (see **ADDRESSES**).

ADDRESSES: You may submit comments on this proposed rule and draft PDM plan by one of the following methods:

- *Electronically: Go to the Federal eRulemaking Portal: http://www.regulations.gov.* In the Search box, enter the Docket Number for this proposed rule which is: FWS–R4–ES–2015–0014. You may submit a comment by clicking on ''Comment now!'' Please ensure that you have found the correct rulemaking before submitting your comment.
- *By hard copy: Submit by U.S. mail or hand-delivery to:* Public Comments Processing, Attn: Docket Number, FWS–R4–ES–2015–0014; U.S. Fish and Wildlife Service; Headquarters, ABHC–PPM, 5275 Leesburg Pike, Falls Church, VA 22041–3803.

We request that you send comments only by the methods described above. We will post all comments on *http://www.regulations.gov.* This generally means that we will post any personal information you provide us (see the Information Requested section below for more information).

Document availability: A copy of the draft PDM plan can be viewed at *http://www.regulations.gov* under Docket No. FWS–R4–ES–2015–0014, or at the Louisiana Ecological Services Field Office's Web site at *http://www.fws.gov/lafayette/.* A companion guide that lists acronyms for this rule also can be found at these Web sites.

Public hearing: We will hold public hearings on the proposed rule, at the following locations: Tallulah, LA on June 23, 2015, from 7:00 to 9:00 p.m. (Central Time) at the Tallulah Community Center, 800 North Beech Street, Tallulah, LA 71282 and Baton Rouge, LA on June 25, 2015, from 7:00 to 9:00 p.m. (Central Time) at the Louisiana Department of Wildlife and Fisheries Headquarters, 2000 Quail Drive, Baton Rouge, LA 70898. Comments will be accepted at the hearings orally or in writing.

FOR FURTHER INFORMATION CONTACT: Jeffrey Weller, Field Supervisor, U.S. Fish and Wildlife Service, Louisiana Ecological Services Field Office, 646 Cajundome Boulevard, Suite 400, Lafayette, Louisiana 70506; telephone (337) 291–3100. Individuals who are hearing-impaired or speech-impaired may call the Federal Information Relay Service at (800) 877–8339 for TTY assistance 24 hours a day, 7 days a week.

SUPPLEMENTARY INFORMATION:

Executive Summary

Purpose of the Regulatory Action

We propose to remove the Louisiana black bear from the Federal List of Endangered and Threatened Wildlife (50 CFR 17.11) due to recovery. This proposed action is based on a thorough review of the best available and commercial information. This document proposes to delist this threatened bear and announces the availability of a draft post delisting monitoring (PDM[1]) plan. We are also proposing to remove the similarity of appearance protections for the American black bear.

Basis for Action

We may delist a species if the best scientific and commercial data indicate the species is neither a threatened species nor an endangered species for one or more of the following reasons:

(1) The species is extinct;

(2) the species has recovered and is no longer threatened or endangered; or

(3) the original data used at the time the species was classified were in error. Here, we have determined that the species may be considered for delisting based on recovery:

- The Louisiana black bear was listed as a threatened species primarily because of the historical modification and reduction of habitat, the reduced quality of remaining habitat due to fragmentation, and the threat of future habitat conversion and human-related mortality (57 FR 588, January 7, 1992). At that time, the Louisiana black bear population consisted of three breeding subpopulations, the Tensas River, Upper Atchafalaya River, and Lower Atchafalaya River Basins (TRB, UARB, and LARB, respectively). An indirect result of habitat fragmentation was isolation of the already small bear populations, subjecting them to threats from such factors as demographic stochasticity[2] and inbreeding. However, key demographic attributes (*e.g.,* survival, fecundity[3], population growth rates, home ranges) for the Louisiana black bear were not known at the time of listing.
- In February 2014, we completed a 5-year status review. The review indicated that habitat restoration and protection, designed to facilitate population expansion, movement of bears between subpopulations, and

[1] See list of commonly used acronyms at *www.regulations.gov* (Docket No. FWS–R4–ES–2015–0014) and *www.fws.gov/lafayette.*

[2] ''Demographic stochasticity'' is defined as the variability in population growth rates arising from random differences among individuals in survival and reproduction within a season.

[3] the reproductive rate of an organism.

genetic exchange between subpopulations, had increased the amount of habitat protected and reduced habitat fragmentation; trends in habitat conversion and loss were reduced and in some instances appeared to have reversed. As identified in the 5-year review, the TRB, UARB, and LARB breeding subpopulations had increased in numbers and range and appeared to be stable or increasing. Additionally, one new breeding subpopulation, the Three Rivers Complex (TRC), had formed in Louisiana, and three more breeding subpopulations were forming on adjacent lands in Mississippi. The extent of movement of individuals between subpopulations and the limits to that interchange had not been documented at the time of the 5-year review. We described in the review that we anticipated making additional progress with partners and believed delisting could be considered for this subspecies in the near future. However, the review did not include a recommendation to reclassify or delist this subspecies.

• Since completion of the 5-year review, the Louisiana black bear population now consists of four main subpopulations in Louisiana and several additional satellite subpopulations in Louisiana and Mississippi. Research has documented that the four main Louisiana subpopulations (TRB, TRC, UARB, and LARB) are stable or increasing (Hooker 2010, O'Connell 2013, Troxler 2013, Laufenberg and Clark 2014, entire documents respectively). The Louisiana black bear recovery plan defines a minimum viable subpopulation as one that has a 95 percent or better chance of persistence over 100 years, despite the foreseeable effects of four stochastic factors: demography, environment, genetics, and natural catastrophe (Service 1995, p. 14). According to the most recent research and modeling efforts, the TRB subpopulation has a 96 to 100 percent probability of persistence over 100 years; similarly, the UARB subpopulation has an 85 to 99 percent probability of persistence over the next 100 years (Laufenberg and Clark 2014, pp. 66–67) and the TRC subpopulation persistence probabilities were greater than or equal to 95 percent only for projections based on the most optimistic set of assumptions (Laufenberg and Clark 2014, p. 67). Although the long-term viability of the LARB subpopulation is not known, it remains the second largest Louisiana black bear subpopulation and has approximately doubled in size in just the last 10 years, in spite of a relatively high rate of adult female mortality (due to anthropogenic and natural sources of mortality, existing dispersal barriers, and other threats to the LARB subpopulation). A metapopulation (a group of subpopulations that interact (*i.e.,* movement of individuals)) now exists among the TRB, UARB, and the TRC subpopulation as a result of bear movements among them. Other interactions have been documented among these and newly forming subpopulations in Louisiana and Mississippi, as well as movement of individuals from subpopulations in Arkansas, has been documented. The current potential for movement of individuals between the LARB and other subpopulations is low (nonexistent for female bears), and immigration into this subpopulation has not been documented (Laufenberg and Clark 2014, p. 85). However, reports of bear live-captures, known natal dens, and confirmed sightings indicate bears can and do move out (at least temporarily) of this subpopulation (Figure 1, Davidson et al. 2015, p. 24). Dispersal by male bears of more than 100 miles is not unusual and combined with the documented occurrences of bears (likely males) on the higher portions (levees and ridges) of the Atchafalaya Basin spanning the area between the UARB and LARB subpopulations, the movement of individuals between the other subpopulations cannot be ruled out. Overall, the Louisiana black bear metapopulation (TRB, UARB, and TRC) has an estimated probability of long-term persistence (more than 100 years) of 0.996 under even the most conservative scenario (Laufenberg and Clark 2014, p. 82). The current movement of individuals between the additional subpopulations elsewhere in Louisiana and Mississippi would only improve metapopulation's chance for persistence (Laufenberg and Clark 2014, p. 94). The opportunity for movement of individuals between the TRB–TRC–UARB metapopulation and the LARB subpopulation is currently low; however, the presence of the relatively large LARB subpopulation and projections for improving habitat conditions (refer to Factor A and D discussions below) between it and the more northerly UARB subpopulation contributes to the persistence of the Louisiana black bear population as a whole. Furthermore, results of these studies indicate that sufficient restoration and protection of habitat supporting breeding subpopulations is in place and is expected to continue to expand in the future, and movement of individuals between those subpopulations has been achieved.

• A large proportion of habitat (an increase of over 430 percent since the time of listing) supporting breeding subpopulations and interconnecting those subpopulations has been protected and restored through management on publicly owned lands, or through private landowner restoration efforts with permanent non-developmental easements. The threat of significant habitat loss and conversion that was present at listing has been significantly reduced and in many cases reversed. These habitat restoration and protection activities are expected to continue due to their value to many other species. Since the listing of the Louisiana black bear in 1992, voluntary landowner-incentive based habitat restoration programs and environmental regulations have not only stopped the net loss of forested lands in the Lower Mississippi River Alluvial Valley (LMRAV), but have resulted in significant habitat gains within both the LMRAV and the Louisiana black bear habitat restoration planning area (HRPA). A substantial portion of those restored habitats are protected with perpetual non-development easements (through the NRCS's Wetland Reserve Program [WRP] or wetland mitigation banking programs) (see the Factor D evaluation below). Public management areas such as National Wildlife Refuges (NWRs), Wildlife Management Areas (WMAs), and Corps of Engineers (Corps) lands supporting Louisiana black bear subpopulations are also protected and managed in a way that benefits the Louisiana black bear. Remnant and restored forested wetlands are provided protection through applicable conservation regulations (*e.g.,* Section 404 of the Clean Water Act of 1972 [CWA]).

Taking into consideration the current long-term viability of the Louisiana black bear metapopulation (TRB, TRC, and UARB), the protection of suitable habitat, and the lack of significant threats to the Louisiana black bear or its habitat, our conclusion is that this subspecies no longer meets the definition of a threatened species under the Act.

Public Comments

We intend that any final action resulting from this proposed rule will be as accurate and effective as possible. Therefore, we request data, comments, and new information on this proposed rule from other governmental agencies, Tribes, the scientific community, industry, or other interested parties. The comments that will be most useful and

likely to influence our decisions are those that are supported by data or peer-reviewed studies and those that include citations to, and analyses of, applicable laws and regulations. Please make your comments as specific as possible and explain the basis for them. In addition, please include sufficient information with your comments to allow us to authenticate any scientific or commercial data you reference or provide. In particular, we seek comments concerning the following:

(1) Biological data regarding the Louisiana black bear including locations of any additional breeding subpopulations.

(2) Relevant data concerning any threats (or lack thereof) to the Louisiana black bear, as well as the extent of Federal and State protection and management, if this rule is finalized, that would be provided to the Louisiana black bear as a delisted species.

(3) Current or planned activities within the geographic range of the Louisiana black bear that may impact or benefit the species (*e.g.,* restoration of prior-converted lands to natural habitat, conversion of habitat to non-habitat conditions through development or clearing, etc.).

(4) The draft post-delisting monitoring plan and the methods and approaches detailed in it.

Please note that submissions merely stating support for or opposition to the action under consideration without providing supporting information, although noted, will not be considered in making a determination, as section 4(b)(1)(A) of the Act directs that a determination as to whether any species is a threatened or endangered species must be made ''solely on the basis of the best scientific and commercial data available.''

In issuing a final determination on this proposed action, we will take into consideration all comments and any additional information we receive. Such information may lead to a final rule that differs from this proposal. All comments and recommendations, including names and addresses, will become part of the administrative record.

You may submit your comments and materials concerning this proposed rule by one of the methods listed in **ADDRESSES**. Before including your address, phone number, email address, or other personal identifying information in your comment, you should be aware that your entire comment—including your personal identifying information—may be made publicly available at any time.

If you submit information via *http://www.regulations.gov,* your entire comment—including any personal identifying information—will be posted on the Web site. While you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so.

Similarly, if you mail or hand-deliver a hardcopy comment that includes personal identifying information, you may request at the top of your document that we withhold this information from public review. However, we cannot guarantee that we will be able to do so. To ensure that the electronic docket for this rulemaking is complete and all comments we receive are publicly available, we will post all hardcopy submissions on *http://www.regulations.gov.*

Comments and materials we receive, as well as supporting documentation used in preparing this proposed rule will be available for public inspection in two ways:

(1) You can view them on *http://www.regulations.gov.* In the Search box, enter FWS–R4–ES–2015–0014, which is the docket number for this proposed rule. Then, in the Search panel on the left side of the screen, select the type of documents you want to view under the Document Type heading.

(2) You can make an appointment, during normal business hours, to view the comments and materials in person at the U.S. Fish and Wildlife Service, Louisiana Field Office (see **FOR FURTHER INFORMATION CONTACT**).

Public Hearing

We have scheduled formal public hearings to afford all interested parties with an opportunity to make formal oral comments on the proposed delisting of the Louisiana black bear. We will hold two public informational open houses from 6:00 p.m. to 7:00 p.m., followed by public hearings from 7:00 p.m. to 9:00 p.m., on the dates specified above in **DATES**, at the locations identified in **ADDRESSES**. A public information open house will take place prior to each public hearing to provide an additional opportunity for the public to gain information and ask questions about the proposed rule. This open house session should assist interested parties in preparing substantive comments on the proposed rule. Persons needing reasonable accommodations in order to attend and participate in the public hearings should contact the Louisiana Field Office at (337) 291–3100 or *FW4ESLafayette@fws.gov* as soon as possible. In order to allow sufficient time to process requests, please contact us for assistance no later than one week before the hearing.

Written comments submitted during the comment period receive equal consideration with comments presented at a public hearing. All comments we receive at the public hearing, both oral and written, will be considered in making our final decision.

Previous Federal Actions

On January 7, 1992, we published a final rule in the **Federal Register** (57 FR 588) listing the Louisiana black bear as threatened within its historic range (east Texas, Louisiana, and southwestern Mississippi). The final rule identified the following threats to the Louisiana black bear: The threat of habitat conversion to non-timber uses in addition to past losses (historical modification and reduced quality of habitat, primarily as a result of conversion to agriculture); the lack of protection of privately owned woodlands in the UARB and TRB areas; the potential effects of human-related mortality (illegal killing); and the inadequacy of existing regulatory mechanisms to protect Louisiana black bear habitat. To address one of those threats (human-related mortality), in the 1992 final rule we also listed the American black bear in § 17.11(h) due to similarity of appearance to the Louisiana black bear. The final listing rule included a special rule under section 4(d) of the Act allowing normal forest management practices in occupied bear habitat, with certain limitations. The List of Endangered and Threatened Wildlife is found in the Code of Federal Regulations (CFR) in title 17 (50 CFR 17.11(h)), and the section 4(d) rule for the Louisiana black bear is found at 50 CFR 17.40(i).

On September 27, 1995, we published the Louisiana Black Bear Recovery Plan (Service 1995, 59 pp.). On August 2, 2007, we initiated a 5-year status review of this species (72 FR 42425). On March 10, 2009, we published a final rule in the **Federal Register** (74 FR 10350) designating 1,195,821 acres (483,932 hectares) of critical habitat in Avoyelles, East Carroll, Catahoula, Concordia, Franklin, Iberia, Iberville, Madison, Pointe Coupee, Richland, St. Martin, St. Mary, Tensas, West Carroll, and West Feliciana Parishes, Louisiana. The critical habitat designation is at 50 CFR 17.95(a). We completed a 5-year status review on February 18, 2014 (Service 2014, 74 pp). The review indicated the individual Louisiana black bear subpopulations (TRB [4], TRC, UARB, and LARB) had exhibited substantial

[4] See list of commonly used acronyms at *www.regulations.gov* (Docket No. FWS–R4–ES–2015–0014) and *www.fws.gov/lafayette.*

improvement. For a summary of the findings of that 5-year status review, see the Executive Summary of this proposed rule.

For additional details on previous Federal actions, see discussion under the Recovery section below. Also, see *http://www.fws.gov/endangered/species/us-species.html* for this species' profile.

Species Information

Distribution and Taxonomy

The Louisiana black bear is one of 16 subspecies of the American black bear (*Ursus americanus*). Historically black bears were widely distributed in the forested areas of North America, including Mexico (Pelton 2003, p. 547). Today, the status and density of bears varies throughout their range with some areas having large populations and others with smaller populations and restricted numbers (Pelton 2003, p. 547). Hall (1981, pp. 948–951) recognized three black bear subspecies ocurring in the southeastern United States. These included:

(1) The American black bear (*U.a. americanus*), historically occuring in the eastern United States and Canada west to the Rocky Mountains, south to central Texas, southern Arkansas, and northern Mississippi, Alabama and Georgia, but now in the Southeast primarily restricted to the Appalachian mountains and small populations in Arkansas and the Atlantic coast (Pelton 2003, p. 547);

(2) the Florida black bear (*U.a. floridanus*) whose range is restricted to small populations in Florida and southern Alabama and Georgia (Pelton 2003, p. 547); and

(3) the Louisiana black bear (*U.a. luteolus*) that historically occurred from eastern Texas, throughout Louisiana and southwest Mississippi (Hall 1981, pp. 950–951) (See Figure 1 for a map detailing the known locations of the Louisiana black bear).

At the time of listing, known Louisiana black bear breeding subpopulations were restricted to the LMRAV in Louisiana (Service 1995, p. 2) with small numbers of bears reported in Mississippi. When we listed the Louisiana black bear, we primarily relied on Hall's (1981, pp. 950–951) depiction of the historical distribution; however, Hall (1981, pp. 950–951) included the southernmost counties of Arkansas as part of the historical range. While acknowledging that the Louisiana black bear was not a geographic isolate and that movement of individuals between American black bears in southern Arkansas and Louisiana bears existed, we did not include those counties as part of the historical range for the listed entity because there were no specimens to support doing so (57 FR 588).

The validity of the Louisiana black bear as a subspecies has been debated during and since listing, primarily focusing on potential genetic effects to Louisiana black bear subpopulations from the translocation of bears from Minnesota during the 1960s and the subspecific status of southern Arkansas bears. Based on Pelton's (1989, pp. 13–15) blood protein, electrophoresis, mitochondrial DNA analysis and Kennedy's (1989, pp. 9–10) analysis of skull measurements, the Service concluded that the evidence, although not overwhelming, did support the validity of the subspecies (55 FR 25341, June 21, 1990) and subsequently listed the Louisiana black bear recognizing its subspecies status and distribution based on morphometric [5] characters. Continued interest in the taxonomic status of this subspecies resulted in numerous additional studies (examining morphometric and genetic data) relevant to the Louisiana black bear. Those studies have produced differing interpretations of the effects of the (intentional) introductions of bears from Minnesota and the interchange with American black bears in southern Arkansas on the taxonomy and distribution of bears in Louisiana (Warrilow et al. 2001, Csiki et al. 2003, Kennedy 2006, Van Den Bussche et al. 2009, entire documents respectively). Due to varying sample sizes, methodologies, and sample population distributions, no definitive determination or conclusion has been accepted (Service 2014, pp. 21–27). Most recently, Laufenberg and Clark's (2014, pp. 60, 84) unified analyses of genetic data from Louisiana, Mississippi, Arkansas, and Minnesota indicate that the three subpopulations of Louisiana black bears in Louisiana are genetically distinct as a result of the following three factors:

(1) restricted gene flow between subpopulations due to habitat loss and fragmentation;

(2) accelerated genetic drift related to past reductions in subpopulation abundances; and

(3) differing levels of genetic introgression as a result of the Minnesota introductions.

Louisiana black bear subpopulations show some affinities to the White River Basin (WRB) subpopulation and Minnesota bears. However, the level of genetic affinity or differentiation between the Louisiana black bear subpopulations and the WRB subpopulation and Minnesota bears is not sufficient evidence for determining taxonomic status (Laufenberg and Clark 2014, p. 85).

Species Description

The Louisiana black bear is a large, bulky mammal with long, coarse black hair and a short, well-haired tail. The facial profile is blunt, the eyes small, and the nose pad broad with large nostrils. The muzzle is yellowish brown with a white patch sometimes present on the lower throat and chest. Black bear color varies between black, blonde, cinnamon, and brown; but in Louisiana, bears have only been documented as black (Davidson et al. 2015, p. 8). Louisiana black bears are not readily visually distinguishable from other black bear subspecies. Black bears have five toes with short, curved claws on the front and hind feet. The median estimated weight for male and female Louisiana black bears in north Louisiana is 292 lb (133 kg) and 147 lb (67 kg), respectively (Weaver 1999, p. 26). This is similar to that reported for black bears throughout their range by Pelton (2003, p. 547).

Reproduction

Average age at first reproduction varies widely across black bear studies; however, most reports involve bears between 3 years and 5 years of age (Weaver 1990a, p. 5). Weaver (1999, p. 28) reported that all adult females (greater than or equal to 4 years old) in the TRB subpopulation had evidence of previous lactation or were with cubs. Breeding occurs in summer and the gestation period for black bears is 7 to 8 months. Delayed implantation occurs in the black bear (blastocysts float free in the uterus and do not implant until late November or early December) (Pelton 2003, p. 547). Observations of Louisiana black bears indicate that they enter dens primarily from late November to early December and emerge in March and April (Weaver 1999, p. 125, Table 4.4). Adult Louisiana black bears generally den longer than subadults, and females longer than males (Weaver 1999, p. 123). Cubs are born in winter dens at the end of January or the beginning of February (Pelton 2003, p. 548). The normal litter sizes range from one to four cubs (Laufenberg and Clark 2014, p. 35), and occasionally litters of five have been documented (Davidson et al. 2015, p. 11). Cubs are altricial (helpless) at birth (Weaver 1990a, p. 5; Pelton 2003,

[5] ''Morphometric'' is defined as the use of measurements of the form of organisms in taxonomic analysis.

p. 547) and generally exit the den site with the female in April or May. Young bears stay with the female through summer and fall, and den with her the next winter (Pelton 2003, p. 548). The young disperse in their second spring or summer, prior to the female's becoming physiologically capable of reproducing again (Pelton 2003, p. 548).

Adult females normally breed every other year (Pelton 2003, p. 548). Not all females produce cubs every other winter; reproduction is related to physiological condition (*i.e.,* female bears that do not reach an optimal weight or fat level may not reproduce in a given year) (Rogers 1987, p. 51). If a female's litter is lost prior to late summer, she may breed again producing cubs in consecutive years (Young 2006, p. 16). An important factor affecting black bear populations appears to be variation in food supply and its effect on physiological status and reproduction (Rogers 1987, pp. 436–437). Nutrition may have an impact on the age of reproductive maturity and subsequent female fecundity (Pelton 2003, p. 547). Black bear cub survival and development are closely associated with the physical condition of the mother (Rogers 1987, p. 434). Cub mortality rates and female infertility are typically greater in years of poor mast [6] production or failure (Rogers 1987, p. 53; Eiler et al. 1989, p. 357; Elowe and Dodge 1989, p. 964). Litter size may be affected by food availability prior to denning (Rogers 1987, p. 53). Reproduction may occur as early as 2 years of age for black bears in high-quality habitat; in poor or marginal habitat, reproduction may not occur until 7 years of age (Rogers 1987, pp. 51–52).

Habitats Used by the Louisiana Black Bear

Like other black bears, the Louisiana black bear is a habitat generalist. Large tracts of bottomland hardwood (BLH) forest communities having high species and age class diversity can provide for the black bear's life requisites (*e.g.,* escape cover, denning sites, and hard and soft mast supplies) without intensive management (Pelton 2003, pp. 549–550). We use the term BLH forest community with no particular inference to hydrologic influence; we use this term to mean forests within southeastern United States floodplains, which can consist of a number of woody species occupying positions of dominance and co-dominance (Black Bear Conservation Coalition (BBCC) 1997, p. 15). Other habitat types may be used by Louisiana black bears including marsh, upland forested areas, forested spoil areas along bayous, brackish and freshwater marsh, salt domes, and agricultural fields (Nyland 1995, p. 48; Weaver 1999, p. 157). Bears have the ability to climb and large-cavity trees (especially bald cypress (*Taxodium distichum*) or water tupelo gum (*Nyssa aquatic*) that are commonly found along water courses are important for denning; however, Louisiana black bears have been observed to use a variety of den types, including ground nests, cavities at the base and in the top of hollow trees, and brush piles (Crook and Chamberlain 2010, p. 1645).

Den trees may be an important component for female reproductive success in areas subject to flooding (Hellgren and Vaughan 1989, p. 352). Den trees located in cypress swamps would also appear to increase the security (*e.g.,* decrease the susceptibility to disturbance) of bears utilizing these dens compared to ground dens; however, the availability of den trees does not appear to be a limiting factor in reproductive success as bears demonstrate flexibility in den use (Weaver and Pelton 1994, p. 431; Crook and Chamberlain 2010, p. 1644). For instance, bears typically excavate open ground/brushpile nests. Shallow depressions that are either bare or are lined with vegetation gathered in the vicinity of the nest (Weaver and Pelton 1994, p. 430). These nests are located in thick vegetation, usually in areas logged within the past 1 to 5 years (Crook and Chamberlain 2010, p. 1643) and are typically found within felled tops and other logging slash (Crook and Chamberlain 2010, p. 1646).

Diet

Bear activity revolves primarily around the search for food, water, cover, and mates during the breeding season. Though classified as a carnivore by taxonomists, black bears are not active predators and only prey on vertebrates when the opportunity arises; most vertebrates are consumed as carrion (Pelton 2003, p. 551). Bears are best described as opportunistic feeders, as they eat almost anything that is available; thus, they are typically omnivorous. Their diet varies seasonally, and includes primarily succulent vegetation during spring, fruits and grains in summer, and hard mast (such as acorns and pecans) during fall. Bears utilize all levels of forest for feeding; they can gather foods from tree tops and vines, but also collect beetles and grubs in fallen logs and rotting wood.

Home Range and Dispersal

The size of the area necessary to support black bears may differ depending on population density, habitat quality, conservation goals, and assumptions regarding minimum viable populations (Rudis and Tansey 1995, p. 172, Pelton 2003, p. 549). Maintaining and enhancing key habitat patches within breeding habitat is a critical conservation strategy for black bears (Hellgren and Vaughan 1994, p. 276). Areas should be large enough to maintain female survival rates above the minimum rate necessary to sustain a population (Hellgren and Vaughan 1994, p. 280). Weaver (1999, pp. 105–106) documented that bear home ranges and movements were centered in forested habitat and noted that actions to conserve, enhance, and restore that habitat would promote population recovery, although no recommendations on minimum requirements were provided. Hellgren and Vaughn (1994, p. 283) concluded that large, contiguous forests are a critical conservation need for black bears. The home ranges of Louisiana black bears appear to be closely linked to forest cover (Marchinton 1995, p. 48, Anderson 1997, p. 35).

Female range size may be partly determined by habitat quality (Amstrup and Beecham 1976, p. 345), while male home range size may be determined by the distribution of females (*i.e.,* to allow for a male's efficient monitoring of a maximum number of females) (Rogers 1987, p. 19). Male black bears commonly disperse, and adult male bears can be wide-ranging with home ranges generally three to eight times larger than those of adult females (Pelton 2003, p. 549) and that may encompass several female home ranges (Rogers 1987, p. 19). Dispersal by female black bears is uncommon and typically involves short distances (Rogers 1987, p. 43). In their studies of dispersal, Laufenberg and Clark (2014, p. 85) found no evidence of natural female dispersion in Louisiana black bears. Females without cubs generally had larger home ranges than females with newborn cubs (Benson 2005, p. 46), although this difference was observed to vary seasonally, with movements more restricted in the spring (Weaver 1999, p. 99). Following separation of the mother and yearling offspring, young female black bears commonly establish a home range partially within or adjacent to their mother's home range (Rogers 1987, p. 39). Young males, however, generally disperse from their maternal home

[6] Hard mast refers to nuts (especially those of beech and oaks); soft mast refers to seeds and berries of shrubs and trees that are eaten by wildlife.

range. Limited information suggests that subadult males may disperse up to 136 miles (219 kilometers) (Rogers 1987, p. 44).

Home range estimates, calculated as the minimum convex polygon (MCP), vary for the Louisiana black bear. The MCP is a way to represent animal movement data and is calculated as the smallest (convex) polygon that contains all the points a group of animals has visited. Mean MCP home range estimates for the Tensas River NWR subpopulation were 35,736 ac (14,462 ha) and 5,550 ac (2,426 ha) for males and females, respectively (Weaver 1999, p. 70). Male home ranges (MCP) in the UARB population may be as high as 80,000 ac (32,375 ha), while female home ranges are approximately 8,000 ac (3,237 ha) (Wagner 1995, p. 12). LARB population home ranges (MCP) were estimated to be 10,477 ac (4,200 ha) for males, and 3,781 ac (1,530 ha) for females (Wagner 1995, p. 12).

Barriers to Movement

Habitat fragmentation can create barriers to immigration and emigration that can affect population demographics and genetic integrity (Clark et al. 2006, p. 12). Fragmentation was identified as a threat to the Louisiana black bear at the time of its listing because it limits the potential for the existing Louisiana black bear subpopulations to expand their breeding range (Service 1995, p. 8). Habitat fragmentation can restrict bear movements both within and between populations (Marchinton 1995, p. 53: Beausoleil et al. 2005, p. 403). Even though Louisiana black bears are capable of traveling long distances, including swimming across rivers, open areas, roads, large waterways, development, and large expanses of agricultural land may affect habitat contiguity, and such features tend to impede the movement of bears (Clark 1999, p. 107). Laufenberg and Clark (2014, p. 84) detected evidence of possible gene flow restriction in the TRB associated with U.S. Interstate 20 (I–20). Such barriers can result in increased mortality as bears are forced to forage on less protected sites, travel farther to forage, or cross roads (Hellgren and Maehr 1992, pp. 154–156, Pelton 2003, p. 549; Laufenberg and Clark 2014, p. 84).

Even bear populations in a relatively large habitat patch are not necessarily ensured of long-term survival without recolonization by bears from adjacent patches (Clark 1999, p. 111). Anderson (1997, p. 73) observed that males may not be as affected by fragmentation as females. Louisiana black bears have been observed to occur in open areas such as fields (Anderson 1997, p. 45). Tracking the dispersal of translocated females demonstrated that bears can disperse through fragmented landscapes (Benson 2005, p. 98). The results of genetic analyses indicated differentiation between the three Louisiana subpopulations present at listing (TRB, UARB, and LARB) partially as the result of restricted gene flow (Laufenberg and Clark 2014, p. 84). Laufenberg and Clark (2014, p. 24) analyzed connectivity between Louisiana black bear subpopulations using a combination of genetic markers (differentiating resident from immigrant bears and within-population genetic structure) and actual bear movements as recorded by global positioning system (GPS) data and step-selection function (SSF) models. Tools like SSF models are relatively new powerful models used to quantify and to simulate the routes and rates of interchange selected by animals moving through the landscape. The SSF models can be used to identify landscape features that may facilitate or impede interchange or dispersal. The results of connectivity modeling indicated that in general, the bears selected a movement direction as distance to natural cover and agriculture decreased and distance to roads increased (Laufenberg and Clark 2014, pp. 70–71). Those models also predicted occasional crossing of habitat gaps (even large ones) by both males and females.

When Laufenberg and Clark examined the potential effect of continuous corridors on bear dispersal, they concluded that while such corridors may be important, they were not more effective than the presence of a broken habitat matrix such as that currently surrounding Louisiana black bear subpopulations (Laufenberg and Clark 2014, p. 85). The genetic and GPS data used in Laufenberg and Clark's study (2014, p. 86) generally agreed with the connectivity model results, which indicated interchange was occurring between some Louisiana black bear subpopulations and unlikely to occur between others (see discussion below where emigration and immigration is discussed). Laufenberg and Clark concluded that a patchwork of natural land cover between Louisiana black bear breeding subpopulations may be sufficient for movement of individuals to occur between subpopulations (at least for males) (Laufenberg and Clark 2014, p. 90).

Historically, the Louisiana black bear was believed to be common or numerous in bottomland hardwood (BLH) forests such as the Big Thicket area of Texas, the TRB, ARB, and LMRAV in Louisiana, and the Yazoo River Basin in Mississippi (St. Amant 1959, p. 32; Nowak 1986, p. 4). Exploitation of Louisiana black bears due to hunting and large-scale destruction of forests from the 1700s to the early 1800s resulted in low numbers of bears that were confined to the BLH forests of Madison and Tensas Parishes and the LARB BLH forests in Louisiana (St. Amant 1959, pp. 32, 44); black bears in Mississippi were similarly affected (Shropshire 1996, pp. 25–33). At the time of listing, additional extensive land clearing, mainly for agricultural purposes, had further reduced its habitat by more than 80 percent (Gosselink et al. 1990, p. 592), and the remaining habitat quality had been degraded by fragmentation. That fragmentation caused isolation of the already small subpopulations, subjecting them to threats from such factors as demographic stochasticity and inbreeding. Known breeding subpopulations were known to occur in fragmented BLH forest communities of the TRB, LARB, and UARB of Louisiana (Weaver 1990a, p. 2; Service 1992, p. 2) (Figure 1), and were believed to be demographically isolated (BBCC 1997, p. 10). No reliable estimates of population numbers were known at the time of listing, but only 80 to 120 Louisiana black bears were estimated to remain in Louisiana in the 1950s (Nowak 1986, p. 4). Bears had occasionally been reported in Louisiana outside of these areas, but it was unknown if those bears were reproducing females or only wandering subadult and adult males (Service 1992, p. 2).

Black bears were also known to exist in Mississippi along the Mississippi River and smaller areas in the Lower East Pearl River and Lower Pascagoula River Basins of southern Mississippi (Weaver 1990a, p. 2). Fewer than 25 bears were estimated to reside in Mississippi at the time of listing (Shropshire 1996, p. 35 citing Jones 1984). The last known Mississippi breeding subpopulation occurred in Issaquena County in 1976 (Shropshire 1996, p. 38 citing Jones 1984). Similarly, black bears were exterminated from southeastern Texas during the period from 1900 to 1940 largely as a result of overhunting (Schmidley 1983, p. 1); and, except for wanderers, the resident bear populations had not been observed in eastern Texas for many years (Nowak 1986, p. 7). Key demographic attributes (*e.g.,* survival, fecundity, population growth rates, home ranges) for the Louisiana black bear were not known at the time of listing.

Currently, the Louisiana black bear remains in the BLH forests of the

LMRAV in Louisiana and western Mississippi; however, based on the number and distribution of confirmed Louisiana Department of Wildlife and Fisheries (LDWF) and Mississippi Department of Wildlife, Fisheries, and Parks (MDWFP) sighting reports (Simek et al. 2012, p. 165; Davidson et al. 2015, p. 22), the geographic distribution of bears has expanded; the number and size of resident breeding subpopulations and the habitat they occupy have also increased (Table 1; Figure 1) resulting in a more scattered distribution of breeding females between the original TRB and UARB subpopulation areas. The TRC is a new breeding subpopulation (*i.e.,* it was not present at the time of listing) located at the confluence of the Mississippi and Red Rivers in Louisiana (formed as a result of a multiyear reintroduction project (2001–2009) (Figure 1), and serves to facilitate movement of bears from the UARB to the TRB (Laufenberg and Clark 2014, p. 85). Several additional new breeding subpopulations, indirectly resulting from those translocations (*i.e.,* female dispersal), are forming in Louisiana and three new breeding subpopulations are forming in Mississippi, partially as an indirect effect of the Louisiana translocation project and from the immigration of WRB bears (Figure 1). Demographic attributes including subpopulation abundance estimates, growth rates, and adult survival rates have been obtained for the three original Louisiana breeding subpopulations (TRB, UARB, LARB) (Hooker 2010, pp. 26–27; Lowe 2011, pp. 28–30; Troxler 2013, pp. 30–37; Laufenberg and Clark 2014, pp. 76–82).

Based on the best available data, all three original breeding subpopulations appear to be stable or increasing, and emigration and immigration (*i.e.,* gene flow) has been documented among several of the Louisiana and Mississippi subpopulations (Laufenberg and Clark 2014, pp. 91–94). The areas supporting Louisiana black bear breeding subpopulations have increased over 430 percent from an estimated 340,000 acres [ac] (138,000 hectares [ha]) in Louisiana in 1993, to the present estimated 1,424,000 ac (576,000 ha) and 382,703 ac (154,875 ha), in Louisiana and Mississippi, respectively, for a total of 1,806,556 ac (731,087 ha) (Table 1). In addition, approximately 148,400 ac (60,055 ha) of private lands have been restored and permanently protected in the Louisiana black bear HRPA since it was listed (Table 2, Figure 2; and see Factor A below). When combined with permanently protected habitat on public lands (Table 3), there are now 638,000 ac (258,200 ha) of permanently protected habitat within the HRPA versus the 227,200 ac (91,945 ha) estimated to exist in 1991 (Service 2014, p. 74, Table 6), an estimated increase of more than 280 percent in protected habitat status.

TABLE 1[7]—ESTIMATED AREA SUPPORTING LOUISIANA BLACK BEAR BREEDING SUBPOPULATIONS (SHOWN IN ACRES AND [HECTARES]) IN 1993 AND 2014.

Breeding habitat	Tensas River Basin [1]	Upper Atchafalaya River Basin [2]	Lower Atchafalaya River Basin [3]	Louisiana total	Mississippi total [3]	Total
1993	84,402	111,275	144,803	340,480	0	340,480
	[34,156]	[45,031]	[58,600]	[137,787]	.....	[137,787]
2014	1,002,750	290,263	130,839	1,423,853	382,703	1,806,556
	[405,798]	[117,465]	[52,949]	[576,213]	[154,875]	[731,087]

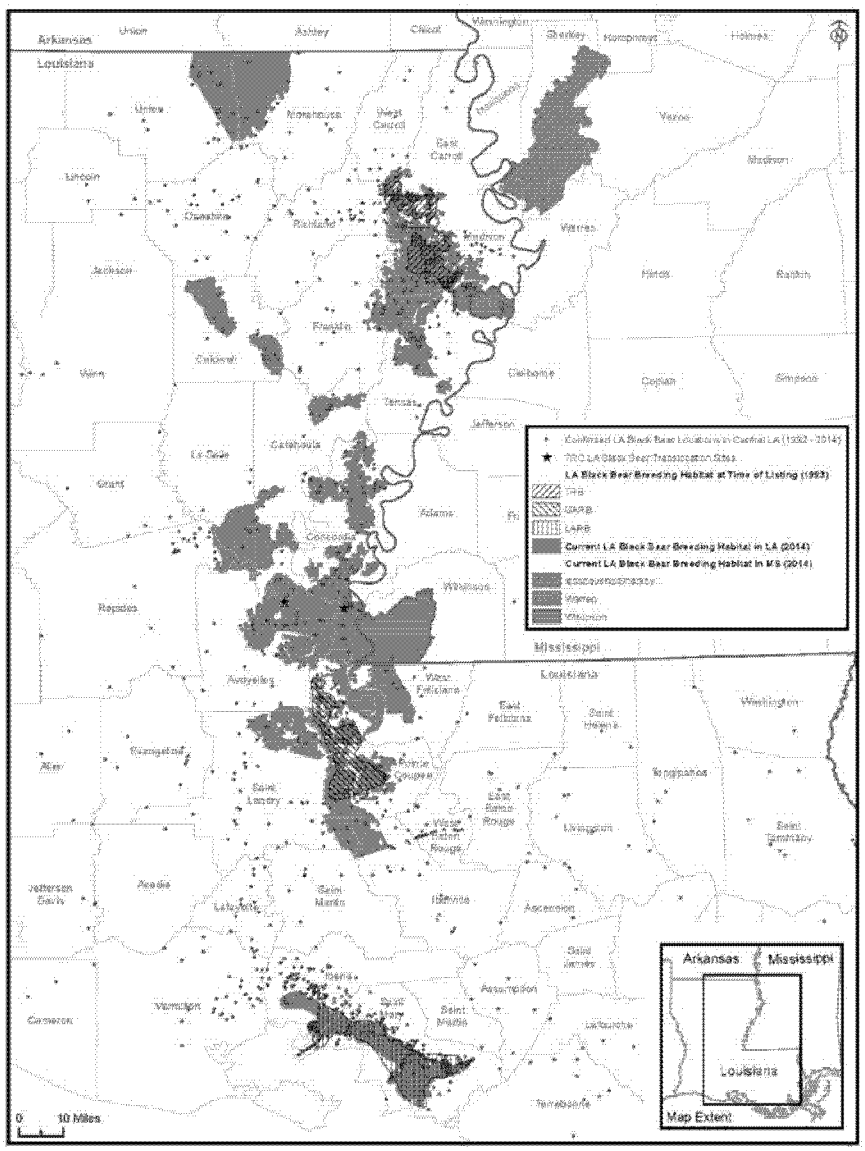
[1] Includes the TRC subpopulation and the Louisiana black bear subpopulation in north-central Louisiana near the Arkansas State line.

[2] Includes the Louisiana black bear subpopulation found in the Florida parishes of Louisiana (east of the Mississippi River).

[3] Although the LARB subpopulation area appears to have decreased in acreage over time; the decrease is due to more detailed mapping in 2014 that excluded many non-habitat areas that were included in the more general 1993 boundary. In fact, spatially, the distribution appears to have increased over time. In 1993, we did not have the data to support including breeding bears on Avery Island (at the western end of this area) even though we knew bears occurred there. We now have that data to support and delineate breeding habitat on Avery Island and, therefore, have included that area in the 2014 mapping updates. The actual area and spatial distribution of this breeding population has likely not changed over time.

[7] For all tables, habitat is listed in acres and hectares. In addition, numbers in each table may not total due to rounding.

Figure 1. Louisiana black bear breeding habitat, 1993 and current.



Subpopulations

Tensas River Basin Subpopulation: The TRB subpopulation is the largest Louisiana black bear breeding subpopulation and occurs in the TRB of Louisiana. It consists of groups of bears located on lands north (privately owned tracts formerly known as the Deltic subpopulation/tracts) and south (Tensas River NWR, Big Lake WMA, Buckhorn WMA, and adjacent private lands) of I–20 and U.S. Highway 80 (Hwy 80). Population numbers have steadily increased since listing as described below. Nowak (1986, p. 7) speculated that the TRB subpopulation consisted of 40 to 50 bears at that time. Subsequent population studies by Beausoleil (1999, p. 51) and Boersen et al. (2003, p. 202) estimated 119 bears in the Tensas River NWR, and 24 to 72 bears in the adjacent Deltic tracts, respectively.

At the time of listing, there was no evidence that interchange was occuring between the two TRB subgroups. They were thought to be isolated and disjunct from each other (BBCC 1997, p. 99) until Anderson (1997, p. 82) reported one of the first instances of a bear moving between these two areas. Evidence of that historical separation in the recent genetic history of sampled bears was detected by Laufenburg and Clark (2014, p. 54). Though the two subgroups are separated by I–20 and Hwy 80, a significant amount of habitat between those subgroups has been restored primarily within the last 10 years. Increased sightings and vehicular mortality of bears in the vicinity of I–20 indicate that bears are attempting to disperse (Benson 2005, p. 97) and current radio-collar data and genetic evidence supports some successful interchange (Laufenberg 2015, personal communication). Furthermore, the current genetic structure of Louisiana black bear subpopulations groups bears in those two areas as one subpopulation (Laufenberg and Clark 2014, p. 60). Hooker (2010, p. 26) estimated a population abundance (for both genders averaged across years) of 294 bears (standard error [SE] = 31) for the combined Tensas River NWR and nearby Deltic and State-owned tracts with an apparent annual survival rate of 0.91 (SE = 0.08), which did not differ by gender. The pooled population annual growth rate for both genders was 1.04

(SE = 0.18), and the mean realized population growth estimate ranged from 0.99 to 1.06 (Hooker 2010, p. 26) indicating a stable to increasing population. Hooker (2010, p. 26) estimated density to be 0.66 bears per square kilometer (km^2) (SE = 0.07). Similar results were obtained by Laufenberg and Clark (2014, p. 45) with mean realized population growth estimates ranging from 0.97 to 1.02.

According to the most recent study results (Laufenburg and Clark 2014, p. 31), the estimated mean annual survival rate for radio-collared adult female bears in the TRB subpopulation was 0.99 (95 percent confidence interval [CI] 0.96–1.00) when data for bears with unknown fates were censored (assumed alive) and was 0.97 (95 percent CI = 0.93–0.99) when unknown fates were treated as mortalities. Detection heterogeneity (differences in detectability among individuals from such things as size, behavior, etc.) is a well known issue in estimating black bear vital rates. Mathematical models can be used to account for those differences; however, it is impossible to identify the appropriate group of distributions (a distribution describes the numbers of times each possible outcome occurs in a sample) to use in a model because the same distribution could result from several different sets of circumstances (Laufenberg and Clark (2014, pp. 18). Therefore, Laufenberg and Clark (2014, pp. 18–19) used two models to estimate population numbers. Model 1 assumed detection heterogeneity followed a logistic-normal distribution, and Model 2 assumed a 2-point finite mixture distribution [8]. We will report results for both models. The current estimated number of females from those two models ranged from 133 to 163 (Laufenberg and Clark 2014, p. 39). Assuming a one to one ratio of males to females and using the most conservative figures, we estimate that the current total population size ranges from 266 to 321 bears.

Mean cub and yearling litter size for the TRB subpopulation were an estimated 1.85 and 1.40 respectively, and fecundity and yearling recruitment for the TRB were 0.47 and 0.15, respectively (Laufenberg and Clark 2014, p. 35). Annual per-capita recruitment estimates ranged from 0.00 to 0.22, and estimates of female apparent survival rates (these included emigration) ranged from 0.87 to 0.93 based on capture-mark-recapture (CMR) data. The estimated mean of the population growth rate ranged from 0.97 (range = 0.88–1.06) to 1.02 (range = 0.98–1.09), depending on model assumptions (Laufenberg and Clark 2014, p. 45), which indicates a stable to increasing population.

Early studies suggested that the TRB subpopulation had low genetic diversity (Boersen et al. 2003, p. 204). The recent study by Laufenberg and Clark (2014, pp. 84–85) indicate that genetic exchange with other subpopulations has occurred at a level substantial enough to increase genetic diversity at TRB (Davidson et al. 2015, pp. 26), primarily as a result of bear emigration from the WRB subpopulation of Arkansas into the TRB subpopulation. The results of recent population structure analyses, however, show evidence of bear emigration from the WRB subpopulation of Arkansas into the TRB subpopulation (Laufenberg and Clark 2014, p. 85). Nearly 30 bears sampled in the TRB had a probability greater than or equal to 0.10 of originating from the WRB subpopulation in Arkansas (6 bears were identified as WRB migrants), and 1 had a 0.48 probability of coming from the UARB (Laufenberg and Clark 2014, p. 63). Additionally, ten bears sampled in northwestern Mississippi were determined to have a probability greater than or equal to 0.90 of originating from the TRB. The analysis of genetic data identified five bears in the TRB as migrants from the WRB subpopulation (Laufenberg and Clark 2014, p. 67). Three males captured in the TRB had CMR histories that indicated they had dispersed from the TRC subpopulation, and an additional male was identified as a second generation migrant from the UARB subpopulation (Laufenberg and Clark 2014, p. 67). One male detected in the TRB subpopulation was subsequently live-captured in Mississippi (Laufenberg and Clark 2014, p. 67).

Laufenberg and Clark (2014, p. 85) suggested genetic interchange by bears from outside the range of the Louisiana black bear (that is, Arkansas) probably should be considered as a positive genetic and demographic contribution to the Louisiana black bear. Connectivity modeling analyses by Laufenberg and Clark (2014, p. 90) indicated that, without the presence of the TRC subpopulation, there was low potential for dispersal of either sex between TRB and UARB. Recent LDWF capture records (USGS et al. 2014) have documented the presence of additional resident breeding females between the TRC and the TRB subpopulations, which may significantly increase the probabilities for interchange (M. Davidson and S. Murphy, LDWF, 2015, unpublished data).

Laufenberg and Clark (2014, p. 90) suggested that the establishment of satellite populations of resident breeding bears between subpopulations may be a more effective measure to link populations than the establishment of continous habitat corridors. Laufenberg and Clark 2014, pp. 22–24) developed a series of population persistence models to assess the long-term viability of Louisiana black bear subpopulations. Those models were developed using multiple methods to address the treatment of bears with unknown fates. Model 1 uses censored fates (assumed alive), and Model 2 assumes mortality. In addition, because there is uncertainty in various (*i.e.,* variation) model parameters that may affect the outcome, three population projections were analyzed for Model 1 and Model 2 resulting in 6 separate population projections (Laufenberg and Clark 2014, pp. 22–23) developed as follows. The first projection accounted for environmental variation for survival and recruitment and also included density dependence (process-only model). Process-only models produced the least conservative (*i.e.,* protective) estimates. The second and third projection models (all-uncertainty projections and the most conservative) included the same sources of variation as the process-only projection, but also included an estimation of uncertainty for survival and recruitment; they differ only in the conservativeness (*i.e.,* worst-case scenario for maximum protection of bears, with the 50 percent confidence interval being less conservative than the 95 percent confidence interval projection). We will report the range of values obtained for all models in the following discussions. Based on CMR estimates from Model 1, the estimated probability of persistence over 100 years for the TRB subpopulation ranged from 1.00 and 0.96 for process-only and all-uncertainty projections, respectively (Laufenberg and Clark 2014, p. 46, Table 4). Similarly, based on the more conservative projections, the probability of persistence was 1.00 and 0.96 based on Model 2 estimates for process-only and all-uncertainty projections (Laufenberg and Clark 2014, p. 46, Table 4).

We estimated there were approximately 400,000 to 500,000 ac (161,875 to 202,343 ha) of forested habitat in the TRB in the early 1990s (Service 2014, p. 33). Comparing the small-scale National Land Cover Database (NLCD) estimates of habitat for 2001 and 2011, there has been an increase of 1,312 ac (531 ha) in the TRB HRPA (Table 8). Currently, based on

[8] For a detailed description of how this modeling was done, see Laufenberg and Clark 2014.

ownership boundaries, there are 255,899 ac (103,559 ha) of State and Federal management areas, and approximately 136,870 ac (55,389 ha) of private lands that have been restored and permanently protected, in the TRB HRPA (Tables 2, 5). We estimated that there were approximately 85,000 ac (34,398 ha) in the TRB HRPA at the time of listing (Service 2014, p. 74, Table 6). In 1993, we estimated that the breeding subpopulation occupied approximately 84,400 ac (34,156 ha). Today, an estimated 1,002,750 ac (405,798 ha) is occupied by the TRB breeding subpopulation (*Table 1*).

Upper Atchafalaya River Basin Subpopulation: Nowak (1986, p. 6) suggested that UARB population numbers were extremely low or believed to be nonexistent before the introduction of Minnesota bears to Louisiana in the 1960s and speculated that the population consisted of 30 to 40 individuals (based on a LDWF 1981 report). Pelton (1989, p. 9) speculated the UARB subpopulation size ranged from 30 to 50 bears. Triant et al. (2004, p. 653) estimated 41 bears in the UARB population at that time. Lowe (2011, p. 28) estimated a UARB population of 56 bears with an annual survival rate of 0.91. More recently, O'Connell-Goode et al. (2014, p. 7) estimated a mean population abundance of 63 bears and mean average male and female survivorship to be 0.77 (SE = 0.08) and 0.89 (SE = 0.04), respectively. The most recent research (Laufenberg and Clark 2014, p. 46) estimated female abundance ranging from 25 to 44 during the study period (50 to 88 total population of males and females, combined), regardless of treatment of capture heterogeneity (or capture differences among individuals). Their estimated annual per-capita recruitment was between 0.00 and 0.41, and apparent female survival was between 0.88 and 0.99 during that time period (Laufenberg and Clark 2014, p. 46, Table 4). The estimated mean growth rate ranged from 1.08 (range = 0.93–1.29) to 1.09 (range = 0.90–1.35) indicating a stable to increasing population (Laufenberg and Clark 2014, p. 46). The estimated probabilities of the UARB subpopulation persistence (*i.e.,* viability) over 100 years were greater than 0.99 for all process-only projections, and greater than 0.96 for model 1 all-uncertainty projections. Persistence probabilities were lowest for the most conservative estimation methods (Model 2, all uncertainty projections) at 0.93 and 0.85, respectively (Laufenberg and Clark 2014, p. 46, Table 4).

As discussed previously, Laufenberg and Clark's connectivity models (2014, p. 90) indicated there was no potential for dispersal of either sex between the TRB and UARB subpopulations without the current presence of the TRC subpopulation. The modeled potential for natural interchange between the UARB and TRC subpopulations is high based on the genetic and capture data (Laufenberg and Clark 2014, p. 85), and genetics data show that gene flow has occurred. Twenty of the 35 TRC cubs showed evidence of having been sired by UARB males. A 2-year-old male tagged as a cub in the UARB was later captured at the TRC, and a second generation migrant from the UARB was later captured in the TRB subpopulation (Laufenberg and Clark 2014, p. 67). The step-selection model (as discussed under Barriers to movement above) predicted that dispersals between the LARB and UARB subpopulations were infrequent but possible for males but nearly nonexistent for females (Laufenberg and Clark 2014, p. 85). Three cubs sampled in west central Mississippi, east of the TRC subpopulation, showed evidence of mixed ancestry between TRB and UARB (Laufenberg and Clark 2014, p. 63). No migrants from the UARB into the WRB or LARB were detected by Laufenberg and Clark (2014, p. 85). Recent LDWF capture records, however, verify the presence of at least one WRB migrant in the TRC subpopulation (M. Davidson, LDWF, unpublished data). Finally, genetic diversity of the UARB subpopulation is the highest among the three original Louisiana black bear subpopulations, and second highest of all extant subpopulations. Results from Laufenberg and Clark (2014, pp. 53–54) indicated this increase may be the result of the persistence of genetic material from bears sourced from Minnesota during the 1960s.

The Atchafalaya basin, located between the UARB and LARB, is currently believed to be too wet to support breeding females. Elevations within the Atchafalaya Basin are increasing due to sedimentation (Hupp et al. 2008, p. 139), and as a result, in the long term, habitat conditions between this subpopulation and the UARB subpopulation may improve over time (LeBlanc 1981, p. 65).

Historical reports do not break the Atchafalaya River Basin into the two areas that we use in terms of bear recovery and habitat restoration planning (*i.e.,* UARB and LARB) but make delineations based on the Corps' Atchafalaya Basin Floodway (Floodway) delineation. The Floodway is roughly equivalent to the UARB as we define it for bears. When the Louisiana black bear was listed, the estimated amount of forested habitat remaining north of U.S. 190 had been reduced 40 to 50 percent (100,000 to 128,000 ac [40,469–51,800 ha] (57 FR 588)). Based on the analyses used for listing, we estimated there were approximately 600,000 ac to 700,000 ac (242,812–283,280 ha) of forested habitat in the UARB area in the early 1990s (Service 2014, p. 33). Comparing small-scale NLCD estimates of habitat for 2001 and 2011, there has been an increase of 2,676 ac (1,083 ha) in the UARB HRPA (Table 8). Currently, based on ownership boundaries, there are 226,037 ac (91,476 ha) of State and Federal management areas and approximately 11,530 ac (4,666 ha) of private lands that have been restored and permanently protected in the UARB HRPA (Tables 2, 5). We estimated that there were approximately 141,000 ac (57,060 ha) of protected lands in the UARB HRPA at the time of listing (Service 2014, p. 74, Table 6). Today, an estimated 130,839 ac (52,949 ha) is occupied by the UARB breeding subpopulation (Table 1), an increase over the 111,275 ac (45,031 ha) estimated around the time of listing.

Lower Atchafalaya River Basin Subpopulation: Nowak (1986, p. 7) speculated that there were approximately 30 bears in the LARB subpopulation. Until recently, the only quantitative estimate for this subpopulation was Triant et al.'s (2004, p. 653) population estimate of 77 bears (95 percent CI = 68–86). Similar to their UARB population estimate, the authors felt this may underestimate the actual population number (Triant et al. 2004, p. 655). Troxler (2013, p. 30) estimated a population of 138 bears (95 percent CI = 118.9–157.9) (which represents a substantial increase over Triant's estimate) and an estimated growth rate of 1.08 indicating that the subpopulation is growing. Laufenberg and Clark's (2014, p. 43) recent LARB population abundance estimate ranged between 78 (95 percent CI = 69–103) and 97 females (95 percent CI = 85–128) from 2010 to 2012 based on Model 1 and between 68 (95 percent CI = 64–80) and 84 (95 percent CI = 79–104) based on Model 2 (we estimate the total combined population of 156–194 or 136–168, respectively). Estimates of apparent female survival ranged from 0.81 to 0.84 (Laufenberg and Clark 2014, p. 43), which are the lowest of all the subpopulations. The reason for this is this area is experiencing a high degree of mortality associated with vehicular collision, and nuisance-related removals Troxler 2013, pp. 37–38); Davidson et

al. 2015, pp. 29–30). In spite of this relatively high rate of adult female mortality (which has persisted for decades), the LARB subpopulation remains the second largest Louisiana black bear subpopulation and has approximately doubled in size in just the last 10 years. The overall size of that subpopulation, coupled with the current positive growth rate (Laufenberg and Clark 2014, p. 46), strongly suggests that anthropogenic and natural sources of LARB mortality, existing dispersal barriers, and other threats to the LARB have not resulted in long-term negative effects to that subpopulation.

Although the LARB subpopulation has occasionally been characterized as a genetically unique subpopulation, recent research (Csiki et al. 2003; Troxler 2013; Laufenberg and Clark 2014) has identified a genetic bottleneck (*i.e.,* isolation resulting in restricted gene flow and genetic drift) as a cause of that uniqueness rather than a true genetic difference. That genetic bottleneck likely resulted from low immigration potential that is restricted by the poor habitat quality found along the northern periphery of the LARB subpopulation. U.S. Highway 90 serves as an additional barrier to movement. The genetic structure analyses found evidence of historic genetic isolation associated with Highway 317 within this subpopulation (Troxler 2013, p. 33; Laufenberg and Clark 2014, p. 54). However, recent data indicate that this has been alleviated and movement of individuals has been occurring within the LARB on both sides of Highway 317 (Troxler 2013, p. 39). As discussed previously, based on the step selection models, the current potential for interchange between this and other subpopulations is low (nonexistent for female bears), and immigration into this subpopulation has not been documented (Laufenberg and Clark 2014, p. 85).

Currently, bears have been observed on the higher portions (levees and ridges) of the Atchafalaya Basin (Figure 1, Davidson et al. 2015, p. 23), between the UARB and LARB subpopulations, but the Basin is believed to be too wet to support breeding females. However, LeBlanc et al. (1981, p. 65) projected that by 2030, over 35,000 ac (14,000 ha) of lakes and cypress–tupelo (*Taxodium distichum—Nyssa aquatic*) swamps would be converted to cypress swamp and early successional hardwood; habitat types more suitable for black bear use. Studies by Hupp et al. (2008, p. 139) confirm the continued sedimentation (filling in) of wet areas within the Atchafalaya Basin. Such changes could ultimately expand the acreage of suitable habitat for the LARB and UARB subpopulations, and improve habitat linkages and genetic exchange between those groups.

We were not able to estimate the amount of forested Louisiana black bear habitat in the LARB around the time of listing based on internal maps and reports, nor were we able to tease it out from the above-mentioned studies. Nyland (1995, p. 58), based on his trapping data, estimated that bears occupied approximately 140,000 ac (56,656 ha) in Iberia and St. Mary Parishes. This is probably a slight underestimate of forested and occupied habitat at that time since it was based primarily on trapping data and did not include Avery Island to the west, a forested salt dome [9] known to be used by bears (Service 2014, p. 34). Comparing NLCD estimates of habitat for 2001 and 2011, there has been an increase of 3,685 ac (1,491 ha) in the LARB HRPA (Table 8). We estimated that there were approximately 9,921 ac (4015 ha) of conservation lands (permanently protected) in the LARB HRPA at the time of listing (Service 2014, p. 73, Table 4). Currently, based on ownership boundaries, there are an estimated 11,573 ac (ha) of conservation lands in the LARB HRPA (Table 5).

In 1993, we estimated approximately 144,803 ac (58,600) supported the LARB breeding population (Table 1). Today, we estimate 130,839 ac (52,949 ha) are occupied by the LARB breeding subpopulation (Table 1). The LARB breeding area appears to have decreased in acreage over time; however, the decrease is due to a more detailed mapping in 2014 that excluded many non-habitat areas that were included in the more general 1993 boundary. In fact, spatially, the distribution appears to have increased over time (Figure 1) because we did not have the data in 1993 to support including breeding bears at the western edge on Avery Island, even though we knew bears were present. We now have the data and, therefore, included breeding bears in the 2014 mapping. Based on the inclusion of the Avery island area and exclusion of non-habitat, the actual area and spatial distribution of this breeding population has likely not changed significantly over time.

Three Rivers Complex Subpopulation: A new breeding subpopulation, not present at listing, currently exists in Louisiana as a result of reintroduction efforts (Benson and Chamberlain 2007, pp. 2393–2403; Davidson et al. 2015, pp. 27–28). The subpopulation occurs in the TRC located primarily on the Richard K. Yancey WMA. The objective of the reintroduction, initiated in 2001, was to establish a new group of reproducing Louisiana black bears in east-central Louisiana (primarily in Avoyelles and Concordia Parishes) that would facilitate the interchange of individuals between the subpopulations currently existing within the Tensas and Atchafalaya River Basins, within the historic range of the Louisiana black bear, but the area in east-central Louisiana was not known to be occupied by reproducing females when this effort began. Until 2001, recovery actions had focused on habitat restoration and protections; reduction of illegal poaching; conflict management; research on Louisiana black bear biology and habitat requirements; and educating the public. No actions, however, had been taken to expedite expansion into unoccupied habitats.

Range expansion of breeding females is a slow process, even when bear habitat is in large contiguous blocks since females typically only disperse very short distances. When the recovery plan was written, translocations (*i.e.,* capture and release) of adult bears, termed a ''hard'' release, were not deemed to be effective, as evidenced with the wide dispersals of the Minnesota reintroductions (Taylor 1971, p. 79). The method of winter translocations of adult females and their young (termed ''soft'' release), however, proved to be successful in Arkansas and was recommended as the preferred method for translocations (Eastridge 2000, p. 100). The site chosen for the releases was at the Richard K. Yancy WMA (formerly known as the Red River and Three Rivers WMAs), located about 80 miles south of the TRB and 30 to 40 miles north of the UARB. In addition to the geographic location, the amount of publicly owned land and potential habitat in that area (179,604 ac (72,714 ha)) encompassing several NWRs, WMAs, and more than 12,000 ac (4,858 ha) of privately owned land in WRP made it the logical site for establishment of an additional breeding subpopulation.

The success of those translocations in the formation of the TRC breeding subpopulation represents a significant improvement in Louisiana black bear population demographic conditions since listing. Abundance estimates for the TRC subpopulation are currently unknown. The mean annual estimated female survival rate (2002–2012) for the TRC subpopulation ranged from 0.93 (95 percent CI = 0.85–0.97) to 0.97 (95 percent CI = 0.91–0.99) (Laufenberg and

[9] A forested salt dome is a dome that is formed beneath the surface when a mass of salt pushes up into the rock layers.

Clark 2014, p. 31). Mean cub and yearling litter size for the same time period were 2.15 and 1.84 in the TRC subpopulation, respectively (Laufenberg and Clark 2014, p. 35). Fecundity and yearling recruitment for the TRC subpopulation were 0.37 and 0.18 (Laufenberg and Clark 2014, p. 31), low compared to the TRB subpopulation, but possibly an artifact of small sample size. The estimated asymptotic growth rates (growth rate estimates calculated from population matrix models) for the TRC ranged from 0.99 to 1.02, for Model 1 and Model 2 respectively (Laufenberg and Clark 204, p. 45). As male cubs born at TRC reach maturity and more males emigrate from the UARB, growth rates of this subpopulation may increase (Laufenberg ad Clark 2014, pp. 70–80). TRC persistence probabilities ranged from 0.295 to 0.999 depending on estimated carrying capacity, the strength of the density dependence, level of uncertainty, and the treatment of unresolved fates (*i.e.,* deaths or lost collars) (Laufenberg and Clark 2014, p. 47). Using the telemetry and reproductive data from the TRC, probabilities of persistence were greater than or equal to 0.95 only for projections based on the most optimistic set of assumptions (*i.e.,* Models 1 and 2, process only) and under the most conservative model (*i.e.,* unresolved fates were assumed dead and more uncertainty was included in model variable estimates), probabilities ranged from 0.34 to .90 (Laufenberg and Clark 2014, pp. 48–49, Tables 5 and 6).

Based on step selection function modeling, the least potential for interchange was between the TRB and TRC subpopulations, and the greatest proportion of successful projections was between the UARB and the TRC (Laufenberg and Clark 2014, p. 74). As discussed previously, the TRC has experienced and possibly facilitated gene flow with other subpopulations (Laufenberg and Clark 2014, p. 84). Three males were captured in the TRB that had dispersed from the TRC, and 20 of 35 cubs sampled in the TRC showed evidence of having been sired by UARB males (Laufenberg and Clark 2014, p. 67). One TRC female dispersed to a location southwest of the TRB subpopulation and apparently bred with an Arkansas bear (Laufenberg and Clark 2014, p. 63). Laufenberg and Clark (2014, p. 83) detected direct evidence of interchange by bears from the UARB to the TRB subpopulation via the TRC subpopulation; however, they did not have any direct evidence of reverse movements. A male bear with UARB ancestry (possibly a second generation migrant) was captured on the TRB, indicating gene flow likely facilitated by the presence of the TRC subpopulation (Laufenberg and Clark 2014, p. 84). Recent LDWF capture records verify the presence of at least one WRB migrant in the TRC subpopulation (Laufenberg and Clark 2014, p. 83).

The TRC contains some of the largest contiguous blocks of publicly owned land in Louisiana. It encompasses approximately 179,600 ac (72,700 ha) of potential bear habitat and roughly 100,000 ac (40,500 ha) of publicly owned, forested land (Richard K. Yancey, Grassy Lake, Pomme de Terre and Spring Bayou WMAs, and Lake Ophelia NWR). The location of this population and its surrounding patchwork of habitat are essential in maintaining connectivity and movement of individuals between the existing TRB and UARB populations.

Mississippi Subpopulations: Black bear numbers are increasing in Mississippi (Simek et al. 2012, p. 165). Shropshire indicated that the most reliable bear sighting reports occurred in nine Mississippi counties (Bolivar, Coahoma, Issaquena, Warren, Adams, Wilkinson, Hancock, Stone, and Jackson (Shropshire 1996, page 55, Table 4.1), and bear sightings are concentrated in three physiographic regions of Mississippi: Southern Mississippi Valley Alluvium [Delta], the Lower Coastal Plain, and the Coastal Flatwoods (Shropshire 1996, p. 57, Table 4.2). The Mississippi population is currently estimated to be about 120 bears, with approximately 75 percent occurring within Louisiana black bear range (B. Young, Mississippi Wildlife Federation, personal communication, 2013). Most of the sightings occur along the Mississippi River and in the lower East Pearl River and lower Pascagoula River basins (Simek et al. 2012). Three new resident breeding populations have formed (first documented in 2005) in north west-central (Sharkey-Issaquena Counties), west-central (Warren County) and south west-central (Wilkinson County) Mississippi (Figure 1). Genetic studies and LDWF CMR studies have documented bear immigration from the WRB and TRB to the northern Mississippi breeding subpopulation and from TRC to the southern Mississippi breeding subpopulation (Laufenberg and Clark 2014, p. 67). Six bears from northwestern Mississippi (sampled east of the TRB and across the Mississippi River) had mixed ancestry between WRB and TRB (Laufenberg and Clark 2014, p. 63). Genetic studies and LDWF CMR studies have documented bear emigration from the WRB and TRB to the Sharkey-Issaquena and Warren County, Mississippi, subpopulations and from TRC to the Wilkinson County, Mississippi, subpopulation (Laufenberg and Clark 2014, pp. 63–67).

Shropshire (1996, p. 64) found that Adams County contained the most suitable habitat in Mississippi and that Delta National Forest was comparable in habitat quality to Tensas River NWR. Habitat suitability models based on landscape characteristics, human attitudes, and habitat quality found the highest habitat suitability was in southern Mississippi and the lowest was in the Delta region (Bowman 1999, p. 180).

Similar to the trend for the TRB area, in the Lower Mississippi River Valley of Mississippi the total forested area increased by 11 percent between 1987 and 1994, and reforestation of former agricultural lands accounted for nearly 40 percent of that increase (King and Keeland 1999, p. 350). Approximately 110,000 ac (41,000 ha) of private land in Mississippi counties adjacent to the Mississippi River have been enrolled in WRP 99-year and permanent easements within the Mississippi Alluvial Valley Black Bear Priority Units (MAVU). When WRP permanent easement lands are added to the habitat protected on Federal and State NWRs or WMAs, other Federal- and State-protected lands, and privately owned protected lands, approximately 868,000 ac (440,000 ha) have been permanently protected and/or restored within the MAVU in Mississippi. Although not permanently protected, approximately 328,000 ac (132,737 ha) were enrolled in the Conservation Reserve Program (CRP) within the MAVU. Approximately 68 percent of breeding habitat in the MAVU is under permanent protection.

East Texas: At the time of listing, populations of bears had not been reported in east Texas for many years, with the exception of the occasional wandering animal (Nowak 1986, p. 7). Keul (2007, p. 1) reviewed historical literature on the black bear in East Texas and concluded that while habitat loss did occur, the primary reason for loss of bears was due to aggressive and uncontrolled sport hunting. The last known areas supporting bears in east Texas was the Big Thicket area of Hardin County and forested areas in Matagorda County, which may have supported a few individuals up to the mid-1940s (Barker et al. 2005, p. 6; Schmidley 1983. p. 1). There was an episode of black bear sightings in east Texas in the 1960s following the reintroduction of Minnesota bears into Louisiana, but by 1983 Schmidley (1983, p. 1) stated there were no resident bears remaining in east Texas.

Sightings of bears in east Texas have gradually increased since 1977, the time period when the Texas Parks and Wildlife Department (TPWD) started collecting data (Chappell 2011, p. 11). Most of those sightings were believed to be juvenile or sub-adult males that had wandered into the northeastern part of the listed range from expanding populations in Oklahoma, Arkansas, and Louisiana (Barker et al. 2005, p. 7). Observations in the 1990s indicate the return of a few black bears to the remote forests of east Texas, primarily transient, solitary males that are believed to be dispersing from Arkansas and Oklahoma (D. Holdermann, TPWD, personal communication, 2014). Kaminski (2011, entire document) conducted a region-wide hair snare survey in east and southeast Texas in areas assumed to have the highest likelihood of bear occurrence and where sightings had been reported. According to the genetic analysis and based on the estimated effectiveness of their sampling method, it was determined it was highly unlikely there were established black bear populations in the region (Kaminski 2011, p. 34). Since 1990, there have been 37 verified black bear sightings in 13 east Texas counties, and preliminary examination of these data suggest that some observations may represent duplicate sightings of individual bears (D. Holdermann, TPWD, personal communication, 2014).

Kaminski (2011, p. 50) used Habitat Suitability Indices (HSI) for black bears in east and southeast Texas to identify 4 recovery units (ranging in size from 74,043 to 183,562 ac (31,583 to 74,285 ha) capable of sustaining viable back bear populations. Estimated HSI scores for each were comparable to other estimates for the occupied range of black bears in the southeast, and the estimated acreage of suitable habitat for all units exceeded those estimated to support existing Louisiana black bear populations (Kaminski 2011). Approximately 11.8 million ac (477,530 ha) of the Pineywoods area of east Texas is classified as forest, of which approximately 61 percent is non-industrial private timberland (Barker et al. 2005, pp. 25–26). Habitat fragmentation may become a concern in east Texas as timberland owners dissolve their holdings over much of southeast Texas lands (Barker et al. 2005, p. 26). Future water reservoir developments further threaten the highest quality habitat remaining in East Texas (Barker et al. 2005, p. 26).

Although there is currently no evidence of a resident breeding population of black bears in east Texas, bear recovery and range expansion in bordering Louisiana, Arkansas, and Oklahoma may increase bear occurrence and activity in east Texas in future years. Habitat restoration activities continue in Texas.

The TPWD field analyses of remaining potential black bear habitats within east Texas (using habitat suitability models) found that the Sulphur River Bottom, Middle and Lower Neches River Corridors, and Big Thicket National Preserve areas in east Texas were all suitable for black bears and that the Middle Neches River Corridor provided the most suitable location for any bear restoration or management efforts in east Texas (Garner and Willis 1998, p. 5). Between 2008 and 2011, more than 500 ac (200 ha) have been restored and 1,550 ac (630 ha) have been enhanced in east Texas via the Hardwood Habitat Cooperative program.

Louisiana Black Bear Population: Since listing there have been many studies of the Louisiana black bear's biology, taxonomy, denning ecology, nuisance behavior, movements, habitat needs, reintroduction efforts, and public attitudes (primarily in Louisiana, but also Mississippi and Texas). See Laufenberg and Clark (2014, p. 5) for a list of that research, and, additionally, much of that work was summarized in the 5-year review for this species (Service 2014). More recent studies have focused on population vital statistics for individual subpopulations such as abundance (*e.g.,* Hooker 2010; Lowe 2011, O'Connell 2013, Troxler 2013). Laufenberg and Clark (2014, entire document) expanded the results of those studies and also conducted genetic structure connectivity studies to examine the viability and connectivity of the Louisiana black bear.

In summary, considering Laufenberg and Clark's recent work (2014, entire document) and prior research, the following conditions exist for the Louisiana black bear population:

(1) The population sizes of the TRB, UARB, and LARB subpopulations have increased since listing, their average population growth rates are stable to increasing, and the probability of long-term persistence for the TRB and UARB subpopulations (except for one UARB modeling scenario) was greater than 95 percent. The probability of long term persistence for the LARB is unknown.

(2) The habitat occupied by the TRB, UARB, and LARB breeding subpopulations has increased; there is a more scattered distribution of breeding females between the original TRB and UARB subpopulation areas; and new satellite breeding populations are forming in Louisiana (Figure 1).

(3) A new breeding subpopulation, the TRC, that was not present at listing, now exists between the TRB and UARB subpopulations and facilitates interchange between those subpopulations.

(4) There is evidence that TRB and UARB bears have emigrated to Mississippi and have contributed to the formation of three resident breeding subpopulations that were not present at listing.

(5) There is evidence of interchange of bears between the TRB, UARB, TRC, WRB, and Mississippi subpopulations; however, the current potential for interchange between the LARB and other subpopulations is low.

(6) The overall probability of persistence for the Louisiana black bear metapopulation comprised of the TRB, TRC, and UARB subpopulations is estimated to be 0.996, assuming dynamics of those subpopulations were independent and using the most conservative population-specific persistence probabilities (*i.e.,* 0.958, 0.295, and 0.849, respectively) (Laufenberg and Clark 2014, p. 47). If subpopulations are not independent (some environmental processes would affect all populations similarly), the long-term viability of the metapopulation could be reduced. However, the high persistence probabilities for the TRB and UARB subpopulations would offset that reduction because the probability that at least one subpopulation would persist would be as great as that for the subpopulation with the greater probability of persistence (which was greater than 95 percent) (Laufenberg and Clark 2014, p. 80).

Recovery

Section 4(f) of the Act directs us to develop and implement recovery plans for the conservation and survival of threatened and endangered species unless we determine that such a plan will not promote the conservation of the species. Recovery plans are not regulatory documents and are instead intended to establish goals for long-term conservation of a listed species; define criteria that are designed to indicate when the threats facing a species have been removed or reduced to such an extent that the species may no longer need the protections of the Act; and provide guidance to our Federal, State, and other governmental and non-governmental partners on methods to minimize threats to listed species. There are many paths to accomplishing recovery of a species, and recovery may be achieved without all criteria being fully met. For example, one or more

criteria may have been exceeded while other criteria may not have been accomplished, yet the Service may judge that, overall, the threats have been minimized sufficiently, and the species is robust enough, to reclassify the species from endangered to threatened or perhaps delist the species. In other cases, recovery opportunities may have been recognized that were not known at the time the recovery plan was finalized. These opportunities may be used instead of methods identified in the recovery plan.

Likewise, information on the species may be learned that was not known at the time the recovery plan was finalized. The new information may change the extent that criteria need to be met for recognizing recovery of the species. Recovery of species is a dynamic process requiring adaptive management that may, or may not, fully follow the guidance provided in a recovery plan.

The following discussion provides a brief review of recovery planning and implementation for the Louisiana black bear, as well as an analysis of the recovery criteria and goals as they relate to evaluating the status of the taxon.

The Louisiana Black Bear Recovery Plan was approved by the Service on September 27, 1995 (Service 1995, 59 pp.). It was developed in coordination with the BBCC and its Black Bear Restoration Plan (BBCC 1997, entire document). The objective of the recovery plan is to sufficiently alleviate the threats to the Louisiana black bear metapopulation, and the habitat that supports it, so that the protection afforded by the Endangered Species Act is no longer warranted.

The four primary recovery actions outlined in the Louisiana black bear recovery plan are:

(1) Restoring and protecting bear habitat;

(2) developing and implementing information and education programs;

(3) protecting and managing bear populations; and

(4) conducting research on population viability, corridors, and bear biology. Significant accomplishments have been made on all of the primary actions for this subspecies (Service 2014, entire document). Below are examples:

Habitat Restoration and Protection: Habitat Restoration Planning maps have been used to focus our conservation efforts resulting in approximately 148,400 ac (60,055 ha) of privately owned lands being restored and protected under the Service's Partners for Fish and Wildlife program and the WRP program. Approximately 480,836 ac (194,588 ha) have been permanently protected, including 126,417 ac (51,159 ha) that have been purchased or put under non-development easements in the Atchafalaya Basin (see the Factor Analysis below for additional details).

Information and Education Programs: The BBCC, which implemented the first public education efforts, developed a landowner habitat management guide and continues to present informational and educational materials about bears and how to live in areas where they occur. The Bear Education and Restoration (BEaR) group of Mississippi, and the East Texas Black Bear Task Force, are additional organizations that actively conduct public education activities through events such as workshops, public talks, and brochures. There are two annual black bear festivals, one each in Mississippi and Louisiana, to promote public education and awareness of bears. Louisiana, Mississippi, and Texas have all developed and are distributing public education and safety informational material. LDWF regularly sponsors hunter safety and teacher workshops.

Protecting and Managing Bear Populations: The BBCC developed the black bear restoration plan in 1997. All three States (LA, MS, TX) now have black bear management plans in place that guide their restoration and management activities. LDWF and MDWFP have nuisance response protocols in place and actively manage human–bear conflicts in coordination with the U.S. Department of Agriculture's (USDA) Wildlife Services program. The LDWF initiated a program with St. Mary Parish to reduce bear human conflict in the LARB by providing an employee dedicated to reduce bear access to anthropogenic food sources (*e.g.* garbage, pet foods) in conjunction with purchasing and deploying bear-resistant waste cans (Davidson et al. 2015, p. 51). The LDWF continues providing financial support for the Parish to maintain this program and has worked with adjacent parishes to implement similar programs. The LDWF and Service have worked with the Louisiana Department of Transportation and Development to provide bear crossing signs on Hwy 90 in the LARB subpopulation and to focus habitat restoration and protection efforts for future bear crossings (*i.e.,* under passes). Similar efforts are underway to address the same concern along I–20 in the TRB subpopulation. The LDWF, in coordination with the Service and U.S. Geological Survey (USGS), has developed a database that is used to track bear occurrences, captures, and mortalities to better manage subpopulations. A multi-partner effort to conduct a translocation program (based on new methodology of being able to use soft releases) from 2001 through 2009 resulted in the successful formation of the TRC breeding subpopulation.

Conduct Research on Population Viability, Corridors, and Bear Biology: More than 25 research studies on Louisiana black bear biology and habitat requirements, subpopulation vital statistics, taxonomy and genetics, and public attitudes in Louisiana, Mississippi, and Texas have been conducted (see Laufenberg and Clark 2014, p. 5 for a partial listing). The LDWF will continue monitoring (using hair snare and mark recapture efforts) the TRB, UARB, TRC, and LARB subpopulations (Davidson et al, 2015, p. 33, Table 3.1). Data from these studies are being used to monitor and manage the bear population.

Additionally, all four of these recovery actions have been identified for continued implementation in the LDWF Black Bear Management Plan (Davidson et al. 2015), the Mississippi Conservation and Management of Black Bears in Mississippi Plan (Young 2006, Appendix A), and the East Texas Black Bear Conservation and Management Plan (Barker et al. 2005, pp. 30–41).

Substantial progress has been achieved in alleviating known threats to the Louisiana black bear through increased habitat protection and restoration, improved population demographics by reduction of habitat fragmentations, increased knowledge of key population attributes (*e.g.,* survival, fecundity, population growth rates, home ranges) necessary to manage this species, responsive conflict management, and increased public education. Many public and private partners have contributed to the current improved status of the Louisiana black bear population by implementing these recovery actions.

Recovery Criteria

The Recovery Plan includes the following criteria to consider the Louisiana black bear for delisting:

(1) At least two viable subpopulations, one each in the Tensas and Atchafalaya River Basins;

(2) immigration and emigration corridors between the two viable subpopulations; and

(3) long-term protection of the habitat and interconnecting corridors that support each of the two viable subpopulations used as justification for delisting.

The recovery plan defines a minimum viable subpopulation as one that has a 95 percent or better chance of

persistence over 100 years, despite the foreseeable effects of four factors: Demography, environment, genetics, and natural catastrophe (Schaffer 1981, p. 133). Long-term protection was defined in the recovery plan as having sufficient voluntary conservation agreements with private landowners and public land managers in the Tensas and Atchafalaya River Basins (in Louisiana) so that habitat degradation is unlikely to occur over 100 years. The recovery plan (Service 1995, p. 14) also noted that the requirements for delisting were preliminary and could change as more information about the biology of the species was known. We continue to believe the recovery criteria outlined in the 1995 Service recovery plan (Service 1995) are valid (see our published 5-year review for the bear at *http://www.fws.gov* for more detail and our evaluation of the latest information as it relates to the criteria).

All of these criteria have been met, as described below. Additionally, the level of protection currently afforded to the species and its habitat, as well as the current status of threats, are outlined below in the *Summary of Factors Affecting the Species* section. In addition, we are issuing a draft PDM plan at the same time as this proposed rule (see Post Delisting Monitoring section). A primary goal of post-delisting monitoring is to monitor the species to ensure the status does not deteriorate, and if a substantial decline in the species (numbers of individuals or populations) or an increase in threats is identified, to enact measures to halt the decline so that re-proposing the species as threatened or endangered is not needed. We may delist a species according to 50 CFR 424.11(d) if the best available scientific and commercial data indicate that the species is neither endangered nor threatened for the following reasons: (1) The species is extinct; (2) the species has recovered and is no longer endangered or threatened; and/or (3) the original scientific data used at the time the species was classified was in error.

Criterion (1): At least two viable subpopulations, one each in the Tensas and Atchafalaya River Basins. Historic habitat fragmentation, and the potential for continued loss and fragmentation, threatened the ability of the bear to survive as a population and also potentially affected the demographic integrity of the subsequently isolated subpopulations. Based on Shaffer's discussion (1981, p. 133), the requirement for two viable Louisiana black bear subpopulations (one each in the Tensas and Atchafalaya River Basins) with exchange of individuals (see Criterion 2) to form a metapopulation would increase the likelihood of two or more subpopulations persisting for 100 years (BBCC 1997, p. 54). In terms of achieving recovery criteria, the UARB subpopulation is located approximately 110 miles south of the TRB and, thus, the Louisiana black bear breeding subpopulation nearest the one in Tensas River Basin. The LARB subpopulation is located approximately 70 miles south of the UARB (therefore, approximately 180 miles south of TRB). When these recovery criteria were developed, there were no successful methods for establishing new breeding subpopulations other than relying on habitat restoration and natural population expansion. Thus, habitat restoration was and still is focused on surrounding all breeding subpopulations. Currently, there is one new breeding subpopulation, the TRC (formed in Louisiana as a result of reintroductions), between the TRB and UARB. This location was chosen for reintroductions in order to facilitate movement of individuals between the UARB and TRB subpopulations. Recent documentation of bear movement between the TRC and UARB and between the UARB and TRB via the TRC subpopulation demonstrates the success of this effort. In addition, several smaller breeding areas indirectly resulting from those reintroductions are forming in Louisiana. Additionally, three naturally forming (and indirectly resulting from the Louisiana reintroductions) breeding populations are establishing themselves in Mississippi, all evidence of increased interchange of bears.

The estimated probability of persistence over 100 years for the TRB subpopulation was 1.00 and 0.96 for process-only Model 1 estimates and was 1.00 and 0.96 for Model 2 estimates (Laufenberg and Clark 2014, p. 46). The probability of persistence of the UARB subpopulation met the 95 percent probability of long-term persistence except under the two most conservative sets of assumptions (Model 2, all uncertainty) (Laufenberg and Clark 2014. p. 82). The estimated asymptotic growth rates for the TRC ranged from 0.99 to 1.02, for Model 1 and Model 2, respectively (Laufenberg and Clark 2014, p. 45). TRC persistence probabilities ranged from 0.29 to 0.99 depending on carrying capacity, the strength of the density dependence, level of uncertainty, and the treatment of unresolved fates (*i.e.,* deaths or lost collars) (Laufenberg and Clark 2014, p. 47). Using the telemetry and reproductive data from the TRC, probabilities of persistence were greater than or equal to 0.95 only for projections based on the most optimistic set of assumptions (Laufenberg and Clark 2014, p. 47).

Estimates of long-term viability of the TRB and the UARB subpopulations were greater than 95 percent except for the two most conservative models for the UARB (long-term viability estimates of 85 percent and 92 percent). Taken together as a system, and assuming that those subpopulations were independent, the combined viability analysis of the TRB, UARB, and TRC (using the most conservative estimates obtained for all three subpopulations) indicated that the Louisiana black bear metapopulation (TRB, TRC, and UARB) has an overall long-term probability of persistence of approximately 100 percent (0.996) (Laufenberg and Clark 2014, p. 92). The current movement of individuals between the additional subpopulations elsewhere in Louisiana and Mississippi would only improve metapopulation's chance for persistence (Laufenberg and Clark 2014, p. 94). The opportunity for movement of individuals between the TRB–TRC–UARB metapopulation and the LARB subpopulation is currently low; however, the presence of the relatively large LARB subpopulation and projections for improving habitat conditions (refer to Factor A and D discussions below) between it and the more northerly UARB subpopulation contributes to the persistence of the Louisiana black bear population as a whole.

This recovery criterion, as described in the recovery plan, calls for two viable subpopulations, one each in the Tensas and Atchafalaya River Basins. The overall goal of the recovery plan was to protect the Louisiana black bear metapopulation and the habitat that supports it so that the protection afforded by the Act is no longer warranted. Based on the above analysis, we believe the Tensas subpopulation is viable and we believe the UARB subpopulation is viable based on three model scenarios. We have high confidence in these three model scenarios. The long term persistence of the Louisiana black bear metapopulation (TRB, TRC, and UARB) is estimated to be at least 0.996 under the most conservative (*i.e.,* using the lowest estimates of viability) model assumptions; therefore, we believe this criterion to be met. We believe that these conservative assumptions identified in these scenarios will likely be present post-delisting as the Louisiana black bear PDM plan is

implemented. Additionally, we will pay close attention to UARB and LARB subpopulation parameters as post-delisting monitoring progresses. The TRC subpopulation located between TRB and UARB provides a mechanism for exchange between the TRB and UARB subpopulations. In addition, this recovery plan criterion did not include the possibility of other populations forming on the landscape because female range expansion is very slow and there was no acceptable methodology at the time to expedite that expansion (*e.g.,* soft release translocations). However, this assumption was proven wrong. In addition to the populations described above, we have documented new breeding populations established in Louisiana and Mississippi (Figure 1).

Criterion (2): Establishment of immigration and emigration corridors between the two subpopulations. This criterion and Criterion 3 (below) are addressed in the recovery plan Action 1: Restore and Protect Bear Habitat. To reach an accurate conclusion regarding the achievement of this criterion, it is essential to fully understand the term ''corridor'' in light of the advances in Louisiana black bear research methodology (and the knowledge gained regarding Louisiana black bear dispersal and interchange) that has occurred since the listing of the Louisiana black bear more than 20 years ago. Although the Louisiana black bear Recovery Plan does not specifically define the term ''corridor'', it does present the future objective of developing corridor requirements and guidelines from available research studies and incorporating pertinent findings and knowledge into practical management guidelines (Service 1995, p. 18).

The Black Bear Restoration Plan states that little was known about Louisiana black bear corridor use and requirements at that time (BBCC 1997, p. 58). Research studies conducted near the time of the Louisiana black bear listing were primarily inconclusive regarding the identification and function of corridors. Weaver et al. (1990b, p. 347) determined that the Louisiana black bear will use tree-lined drainages in agricultural areas to travel between larger forested tracts. They also stated, however, that ''research is needed to document the characteristics a corridor must possess to make it suitable for use by bears as a habitat link.'' Marchinton (1995, pp. 53, 64) speculated that male Louisiana black bear movements, though influenced by habitat fragmentation patterns, were not inhibited by the level of fragmentation within his study area (which was typical of the landscape throughout the range of the Louisiana black bear). He also discussed anecdotal evidence which suggested that ''adult male bears would cross open fields'' (Marchinton 1995, p. 59). We believe those early studies not only challenged the continuous-habitat-linkage perception of a corridor, but also described the need for additional research to clearly characterize the qualities and functions of such corridors.

The Black Bear Restoration Plan states that ''the criteria for measuring corridor effectiveness should also consider corridor function'' and ''research is urgently needed to determine the corridor functions, their size and shape, and their actual effectiveness'' (BBCC 1997, p. 58). To assess the function and role of corridors in Louisiana black bear dispersal and genetic exchange, Laufenberg and Clark (2014, pp. 24–31) conducted a movement, or step selection, study throughout a large portion of the range of the Louisiana black bear. In regard to facilitating Louisiana black bear movement between subpopulations, their findings indicated that, while contiguous forested habitat linkages can be beneficial to bears moving through a fragmented landscape, hypothetical forested corridors ''were not more effective than the broken habitat matrix that surrounded many of the subpopulations'' (Laufenberg and Clark 2014, p. 85). Their study also documented interchange occurring ''from the UARB to the TRB by way of the TRC'' (Laufenberg and Clark 2014, pp. 2, 84). Such interchange supports the assertion by Laufenberg and Clark (2014, p. 90) that the presence of multiple satellite populations of breeding bears on the landscape may be more effective in establishing and/or maintaining connectivity between the larger subpopulations than the presence of contiguous forested linkages.

Most such satellite populations exist today as a result of a multi-agency project undertaken specifically to reduce demographic isolation of the existing TRB and UARB subpopulations. That translocation project, initiated in 2001, was based on the assumption that relocated females with cubs would remain at a new location (not currently supporting a Louisiana black bear subpopulation) and adult females would be discovered by males traveling through the area. From 2001 through 2009, 48 females and 104 cubs were moved (primarily from the TRB) to a complex of public lands located between the TRB and the UARB subpopulations. Though most relocated females and their offspring remained within the vicinity of their release site (creating a new subpopulation that reduced the distance between existing subpopulations), a few dispersed to various habitat patches creating the satellite populations that now facilitate interchange between the larger subpopulations.

As part of the recovery process, HRPA maps were developed by a collaborative multi-agency and organization group (Federal, State, local government partners, and nonprofit organizations including but not limited to the Natural Resources Conservation Service (NRCS), LDWF, BBCC, Louisiana State University, the Louisiana Nature Conservancy, and the Service) to design and create landscape features to support the habitat-block/satellite-population corridor concept that facilitates such interchange. The Louisiana black bear HRPA maps are regularly updated; the most recent update was in the spring of 2011. Those maps are designed for use with conservation programs administered by NRCS) (*e.g.,* WRP) and the Service (*e.g.,* Partners for Fish and Wildlife (PFW)), which primarily encourage reforestation of marginal and nonproductive cropland in Louisiana. The maps, using a 3-tiered point system, establish higher point zones (indicating higher importance for bear recovery and thus providing landowners competing for this conservation funding with a higher ranking) around breeding bear habitat, large forested areas, and various habitat patches that may facilitate interchange between Louisiana black bear subpopulations. Areas that would benefit breeding subpopulations and corridors thus receive the highest priority and landowners competing for WRP enrollment would receive higher rankings in those areas. Most WRP tracts are encumbered by permanent easements that protect the land from future conversion or development (refer to discussion in Factor D).

Similar conservation priority maps have been developed and are currently in use in Mississippi (Ginger et al. 2007). The TPWD and its partners have developed Land Conservation Priority Maps for East Texas and a Hardwood Habitat Cooperative that offers a cost-share program to landowners seeking to restore or enhance hardwood habitat on their lands. In East Texas, more than 500 ac (200 ha) have been restored and 1,550 ac (630 ha) were enhanced via the Hardwood Habitat Cooperative program between 2008 and 2011.

The Louisiana Black Bear Recovery Plan states that corridors providing cover may facilitate the movement of bears between highly fragmented forest tracts. It also states, however, that the Louisiana black bear has been known to

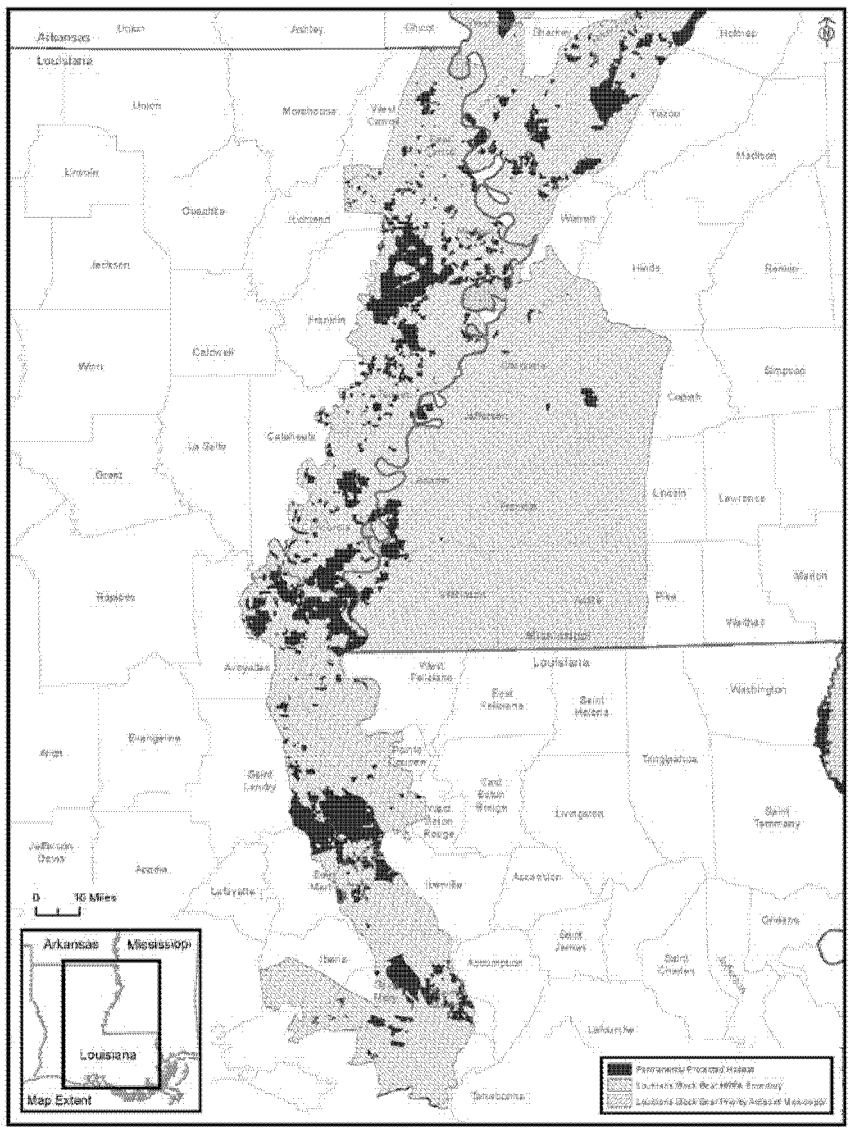
cross open, agricultural fields even when forested corridors were available, and that ''habitat blocks (large blocks of land) may provide more effective corridors'' (Service 1995, p. 6). This type of habitat-block/satellite-population corridor occurs throughout the range of the Louisiana black bear in the form of remnant forested patches and tracts of restored habitat (on private and public lands), and has been augmented by the relocation of bears into east-central Louisiana. Laufenberg and Clark (2014, p. 90) concluded, based on the result of their work, that a patchwork of natural land cover between Louisiana black bear breeding subpopulations may be sufficient for movement of individuals between subpopulations (at least for males). Laufenberg and Clark (2014, p. 85) postulated that, while such corridors may be important, they were not more effective than the presence of a broken-habitat matrix such as what is surrounding current Louisiana black bear subpopulations. As described above, research supports this corridor concept and the documented evidence of interchange between the UARB and the TRB subpopulations (and additional interchange with subpopulations in Arkansas and Mississippi) provides further validation. The Louisiana black bear recovery plan indicates ''key corridors or habitat blocks need to be identified and will be required to ease fragmentation within and between occupied habitat for the Louisiana black bear.'' We have clearly documented evidence of interchange between the TRB and UARB subpopulations by way of the TRC, and, therefore, we have met this criterion.

Criterion (3): Long-term protection of habitat and interconnecting corridors that support each of the two viable subpopulations used as justification for delisting. The recovery plan states that long-term protection is defined as having sufficient voluntary conservation agreements with private landowners and public land managers in the Tensas and Atchafalaya River Basins so that habitat degradation is unlikely to occur over 100 years (Service 1995, p. 14). Additionally, the Black Bear Restoration Plan states that criteria for determining whether long-term habitat and corridor protection has been achieved could include ''data projecting future habitat trend according to historical trend in acreage and habitat type/quality'' (BBCC 1997, p. 58). It further states that other metrics to consider may include the extent of cooperating private landowners and the nature of their respective conservation agreements, as well as ''federal legislation restricting agricultural conversion of wetlands, and the nature of conservation easements such as those being obtained from private landowners by the Corps in the Atchafalaya Floodway'' (BBCC 1997, p. 58). Employing those criteria, and based on the genetic and connectivity studies by Laufenberg and Clark (2014), it is evident that not only are corridors between the UARB and the TRB subpopulations present and functional, they are afforded long-term protection through a combination of conservation easements and environmental regulations.

Habitat Protection Through Ownership or Permanent Easements: An estimated 450,000 to 550,000 ac (182,000 to 222,000 ha) of BLH forest habitat were restored in the LMRAV within 12 years of the Louisiana black bear being listed as a threatened species (Haynes 2004, p. 173). Since 1992, more than 148,000 ac (60,000 ha) of land has been permanently protected and/or restored in the HRPA via the WRP program (mostly in the TRB and UARB areas) (Table 2). It should also be noted that, in Louisiana, there are approximately 480,000 ac (195,000 ha) of public lands within the HRPA that are managed or maintained in a manner that provides benefits to bears (Table 5). Approximately 460,000 ac (186,000 ha) of public lands in Louisiana and Mississippi directly support Louisiana black bear breeding populations (Table 6, Figure 2).

Habitat Protection Through Regulations and Mitigation: A large proportion of the remaining forested habitat that is not encumbered by perpetual conservation servitudes or public ownership and management are occasionally to frequently flooded and would not be suitable for conversion to agriculture or development without the construction of significant flood control features. The construction of such features or other activities would eliminate or reduce existing wetland habitat (including forested wetlands) and would be regulated via The Food Security Act of 1985 and/or Section 404 of the CWA. Although the CWA was initially considered insufficient to ensure the long-term protection of Louisiana black bear corridors, significant changes have occurred in the legal interpretation and authoritative limits of the CWA. As the result of multiple court cases and revised legal interpretations, the regulatory scope and enforcement authority of the Corps and the Environmental Protection Agency (EPA) under the CWA was substantially broadened (see discussion under Factor D for additional information). With the institution of those regulatory changes, the trajectory of BLH forest loss in the LMRAV has not only improved, but has also been reversed. This trend reversal is heavily supported by published accounts (Haynes 2004, p. 173), natural resource management agency records (Table 2), and our analysis of classified imagery within the Louisiana black bear HRPA (Tables 7 and 8). The habitat loss trend reversal is further supported by an analysis of data obtained from the Corps' wetland regulatory program, which demonstrates that substantially more forested habitat is restored through compensatory wetland mitigation than is eliminated via permitted wetland development projects (Table 10). Furthermore, the Corps' wetland regulatory program data indicate that the ratio of wetland habitat gains from compensatory mitigation to wetland habitat losses attributed to permitted projects is 6:1 (R.M. Stewart, Vicksburg District Corps, personal communication, 2014).

Figure 2. Permanently protected lands within Louisiana Black Bear Restoration Planning Areas in Louisiana and Mississippi in 2014.



In summary, the current distribution of habitat patches and breeding subpopulations have been documented to provide sufficient connectivity for interchange to occur between the UARB and the TRB subpopulations as detailed in Criterion 2 (Laufenberg and Clark 2014, pp. 83–84). A substantial amount of forested habitat within the Louisiana black bear HRPA system is perpetually protected through conservation easements (on private lands) and fee-title purchases (public lands) for the purpose of providing wildlife habitat (which includes Louisiana black bear habitat (Figure 2). All available data indicate that current environmental laws and regulations (in particular, the CWA) are sufficient to provide long-term protection of the Louisiana black bear corridor system. In fact, relating to the Louisiana black bear, data clearly demonstrate that the CWA regulatory program not only provides adequate protection for its habitat, but has also resulted in habitat gains due to compensatory mitigation requirements (see Table 11 and discussion under Factor A, below). The ''Swampbuster'' provisions of the Food Security Act of 1985 provide additional protections against the conversion of forested wetlands for agricultural purposes. There is no available information to suggest that either of these regulatory protections would be weakened or eliminated in the foreseeable future.

We have no information to suggest that the current trend of habitat gains within the LMRAV and the HRPA from voluntary landowner-incentive based programs and environmental regulations would not continue for the foreseeable future (Tables 2, 3, 7, 8, and 10). A substantial acreage of the habitat that supports the main breeding subpopulations in the TRB and UARB is in public ownership (*e.g.,* Tensas River NWR, Big Lake WMA, Buckhorn WMA, Richard K. Yancey WMA, Sherburne WMA, and Bayou Teche NWR) and managed to provide habitat for a variety of wildlife including the Louisiana black bear (see *State-owned lands* and *U.S. Fish and Wildlife National Wildlife Refuges* sections of Factor D). Accordingly, we believe that the habitat within the Louisiana black bear corridor system is functional, and is afforded long-term and adequate protection from

existing regulatory mechanisms and through the management efforts of our State, Federal, and non-governmental partners.

Summary of Factors Affecting the Species

Section 4 of the Act and its implementing regulations (50 CFR part 424) set forth the procedures for listing, reclassifying, or removing species from the Federal Lists of Endangered and Threatened Wildlife and Plants. To list a species, we must first evaluate whether that species may be an endangered species or a threatened species because of one or more of the five factors described in section 4(a)(1) of the Act. We must consider these same five factors in reclassifying or delisting a species. The Act does not define the term ''foreseeable future.'' For the purpose of this rule, we define the foreseeable future to be the extent to which, given the amount and substance of available data, we can anticipate events or effects, or reliably extrapolate threat trends, such that we reasonably believe that reliable predictions can be made concerning the future as it relates to the status of the Louisiana black bear. A recovered species is one that no longer meets the Act's definition of a threatened or an endangered species.

The following analysis examines all five factors currently affecting, or that are likely to affect, the Louisiana black bear within the foreseeable future.

Factor A. The Present or Threatened Destruction, Modification, or Curtailment of Its Habitat or Range

The final rule that listed the Louisiana black bear as a threatened subspecies states that it ''meets the criteria for protection under the Act on the basis of past habitat loss alone'' (57 FR 588). It also identified the threat of further habitat loss of occupied habitats due to conversion to agriculture or other non-timber uses on top of past severe losses that occurred (historical modification and reduction and reduced quality of habitat, primarily as a result of conversion to agriculture), the lack of protection of privately owned woodlands in the north Atchafalaya and Tensas River Basins, and inadequacy of existing regulatory protections to protect Louisiana black bear habitat (see Factor D for regulatory mechanism discussion).

We present multiple habitat assessment metrics to establish trends within the LMRAV and the Louisiana black bear HRPA. This relatively high level of redundancy is provided to demonstrate that habitat trends have been accurately identified, and to compensate for the limitations in geographic information system (GIS) technology at the time of listing of the Louisiana black bear. GIS technology was in its infancy in the 1990s, so our ability to accurately delineate the extent and distribution of Louisiana black bear habitat at the time of listing was determined from a best professional estimate based on hand-drawn maps. In addition, the geographic areas used for those initial estimates were not often well described and varied by study, making successive temporal comparisons quite difficult. Advances in technology, including GIS and remotely sensed data (*e.g.,* aerial and satellite imagery), currently allow for highly accurate identification and delineation of habitat based on specified characteristics. This, subsequently, provides for a more consistent and reproducible estimate of Louisiana black bear habitat distribution and trend.

According to Haynes (2004, p. 172), the forested wetlands of the LMRAV have been reduced from historic estimates of 21 to 25 million acres (8.5 to 10 million ha) to a remnant 5 to 6.5 million acres (2 to 2.6 million ha). Significant increases in soybean prices in the late 1960s and early 1970s provided the impetus for the large-scale conversion of forested habitat to agriculture, which was facilitated by improved flood control, drainage, and technology (Wilson et al. 2007, pp. 7–8). Allen et al. (2004, p. 4) concurred that the primary cause of bottomland hardwood loss has been conversion to agricultural production. According to Creasman et al. (1992) as cited by Haynes (2004, p. 170), approximately 78 percent of the bottomland forests in Arkansas, Louisiana, and Mississippi had been lost to conversion at the time of listing. When the bear was listed in 1992, the Service recognized that the rate of loss of bear habitat had leveled off (Service 1992, p. 592). Since that time (1990–2010), forested habitat within the LMRAV has increased (Oswalt 2013, p. 4).

The Black Bear Restoration Plan states that the delisting criteria standard of long-term habitat and corridor protection could involve a projection of future habitat trend based on historical trends in acreage and habitat type/quality (BBCC 1997, p. 58). In that regard, Schoenholtz et al. (2001, p. 612; 2005, p. 413) described a ''promising or encouraging'' trend in the annual increase of afforestation (planting of trees to create forested habitat) in the LMRAV. Available data indicates that over the past three decades, forest restoration in the LMRAV portions of Louisiana, Mississippi, and Arkansas has increased dramatically, and has led to a significant removal of land from agricultural production for the purpose of hardwood forest establishment (Gardiner and Oliver 2005, p. 243; and Oswalt 2013, p. 6). In some areas, these gains have been especially noteworthy. For example, West Carroll Parish, Louisiana, experienced a 92 percent loss of forested area from 1950 (45 percent forest) to 1980 (8 percent forest), and in 2013, the parish was approximately 18 percent forested (Oswalt 2013, p. 4).

As stated in Table 1, breeding habitat for the bear at the time of listing was roughly 340,400 acres. The total has grown based on implementation of recovery actions with numerous partners to more than 1,800,000 acres by the end of 2014. This is approximately five times the amount of area occupied by breeding subpopulations than was occupied at the time of listing. Examples of actions that have helped reduce habitat loss or improve suitable habitat for the Louisiana black bear are discussed below.

A major factor in this positive habitat trend is the success of incentive-based private land restoration programs, such as WRP, which was established by the Food Security Act of 1990. The WRP has been ''perhaps the most significant and effective wetland restoration program in the world'' (Haynes 2004, p. 173). According to Haynes (2004, p. 173), within 12 years of the Louisiana black bear being listed as a threatened species, an estimated 450,000 to 550,000 ac (182,000 to 222,000 ha) of BLH forest had been restored in the LMRAV. Since 1992, more than 148,000 ac (60,000 ha) of land has been permanently protected and/or restored in the HRPA via the WRP program (mostly in the TRB and UARB areas) (Table 2). The entire 148,000 ac (60,000 ha) of restored land benefits movement between populations, with approximately 97,000 ac (39,000 ha) directly benefitting breeding populations (Table 2). The use of the Louisiana Black Bear Habitat Restoration Planning Maps in conjunction with the WRP has not only increased the total amount of available Louisiana black bear habitat, but has also allowed us and our partners to directly focus on addressing the recovery criteria. When WRP permanent easement lands are added to the habitat protected on Federal and State NWRs or WMAs, mitigation banks, and the numerous Corps fee title and easements (as discussed in detail under the Factor D section), approximately 638,000 ac (258,000 ha) have been permanently protected and/or restored within the HRPA in Louisiana (Table 3). Although not permanently protected, an additional 122,000 ac (49,000 ha) of

lands currently enrolled in 10- to 15-year agreements via the CRP program of the Farm Service Agency (FSA) within the HRPA (Table 4) provide short-term habitat that can be used by bears for foraging/denning and travel.

Many of the remaining forested wetland areas (as we have detailed) have been protected within our National Wildlife Refuge System, in National Forests, in State WMAs, and on U.S. Department of Agriculture WRP or other conservation easement sites (King et al. 2006). The Partners for Fish and Wildlife Program focuses on conservation delivery adjacent to or nearby such protected areas to help meet our strategy of expanding main conservation areas and linking habitat by reducing fragmentation. Numerous projects administered through this program have provided direct habitat benefits for the Louisiana black bear. Additional details regarding the effectiveness of this program can be found in the Factor D section, titled *Partners for Fish and Wildlife Act Regulations.*

It should also be noted that in Louisiana there are approximately 480,000 ac (195,000 ha) of public lands (*e.g.,* NWRs, WMAs, and Corps lands) that are managed or maintained in a way to benefit wildlife (including bears) in the HRPA (Table 5). A description of the formal guidance and/or legal documents that direct those management actions is provided in Factor D below. Several of these public lands did not exist or were not as large in the early 1990s as they are today (*e.g.,* Bayou Teche NWR, Tensas River NWR, Buckhorn WMA). Approximately 460,000 ac (186,000 ha) of public lands (inside and outside of the HRPA) in Louisiana and Mississippi directly support Louisiana black bear breeding populations (Table 6).

In summary, there are about 460,000 ac (186,000 ha) of Federal- and State-owned conservation lands managed for wildlife in Louisiana and Mississippi that directly support Louisiana black bear subpopulations. If this proposed delisting is finalized, those areas would continue to remain permanently protected. Since listing, we have gained more than 4,000 ac (1,600 ha) of Federal land in Mississippi that benefit bears, acquired new NWRs (such as Bayou Teche NWR in Louisiana in 2001), and expanded others. In addition to the permanently protected habitat in public ownership, we have worked with States and landowners to secure 148,000 ac (60,000 ha) of permanent WRP easements. Regardless of whether the bear is delisted, these voluntary permanent easements protect wetlands and ensure that habitat will be maintained (see Factor D for associated regulatory protections). In addition to the approximately 638,000 ac (258,000 ha) of permanently protected habitat (refer to Table 3), there are roughly 122,000 ac (49,000 ha) of habitat enrolled in CRP (with 10- to 15-year contracts), which also provides benefits to the Louisiana black bear.

Forested wetlands throughout the range of the Louisiana black bear habitat that are not protected through direct public ownership or easements on private lands will continue to receive protection through Section 404 of the CWA and the ''Swampbuster'' provisions of the Food Security Act of 1985. Forested habitat trends in the LMRAV indicate that those regulations have provided adequate long-term protection of Louisiana black bear habitat since the listing of the Louisiana black bear in 1992. The trajectory of BLH forest loss in the LMRAV has been reversed with substantial gains in forested habitat being realized within both the LMRAV and the more restrictive HRPA.

To further evaluate forested wetland habitat trends within the HRPA, we employed a digital GIS analysis of landscape changes in which classified habitat types were monitored over time. To increase the confidence level of that analysis, we evaluated two independent sets of imagery (image dates were based on availability). The results of both methodologies (shown in Tables 7 and 8 below) demonstrate significant gains in potential bear habitat within the Louisiana black bear HRPA in recent decades. Those results are consistent with government agency records for forested habitat restoration through programs such as WRP, CRP, and wetland mitigation banking.

TABLE 2—PRIVATE LANDS ENROLLED IN THE USDA NATURAL RESOURCES CONSERVATION SERVICE WETLAND RESERVE PROGRAM (PERMANENT EASEMENTS) SUPPORTING BREEDING HABITAT AND WITHIN THE LOUISIANA BLACK BEAR HABITAT RESTORATION PLANNING AREAS (HRPA), LA (ac [ha])

	Tensas River Basin [1]	Upper Atchafalaya River Basin	Lower Atchafalaya River Basin	Total
Breeding Habitat [2]	90,198 [36,502]	6,500 [2,630]	0 0	96,698 [39,132]
HRPA	136,870 [55,389]	11,530 [4,666]	0 0	148,400 [60,055]

[1] Includes the TRC subpopulation.
[2] Breeding habitat is primarily contained within the HRPA, but has expanded beyond it in some areas.

TABLE 3—TOTAL AREA (NWRS, WMAS, WRPS, CORPS LANDS, FARMERS HOME ADMINISTRATION [FmHA] EASEMENT TRACTS, AND WETLAND MITIGATION BANKS) WITHIN LOUISIANA BLACK BEAR BREEDING HABITAT AND THE LOUISIANA BLACK BEAR HRPA WITHIN LOUISIANA (ac [ha])

	Tensas River Basin [1]	Upper Atchafalaya River Basin [3]	Lower Atchafalaya River Basin [3]	Total [3]
Louisiana black bear breeding habitat	1,002,750 [405,799]	290,263 [117,465]	130,839 [52,949]	1,423,853 [576,213]
Permanently protected Louisiana black bear breeding habitat [2]	493,639 [199,769]	91,880 [37,182]	7,614 [3,081]	593,133 [240,032]
Percent of Louisiana black bear breeding habitat that is permanently protected [2]	49.2	31.7	5.8	41.7

TABLE 3—TOTAL AREA (NWRS, WMAS, WRPS, CORPS LANDS, FARMERS HOME ADMINISTRATION [FmHA] EASEMENT TRACTS, AND WETLAND MITIGATION BANKS) WITHIN LOUISIANA BLACK BEAR BREEDING HABITAT AND THE LOUISIANA BLACK BEAR HRPA WITHIN LOUISIANA (ac [ha])—Continued

	Tensas River Basin [1]	Upper Atchafalaya River Basin [3]	Lower Atchafalaya River Basin [3]	Total [3]
Louisiana black bear HRPA	2,054,811 [831,553]	1,200,844 [485,964]	366,001 [148,115]	3,621,656 [1,465,632]
Permanently protected habitat within the Louisiana black bear HRPA	408,400 [165,274]	217,936 [88,195]	11,573 [4,683]	637,909 [258,152]
Percent of the Louisiana black bear HRPA that is permanently protected	19.9	18.1	3.2	17.6

[1] Includes the TRC subpopulation.
[2] Breeding habitat is primarily contained within the HRPA but has expanded beyond it in some areas.
[3] Figures shown in this table are based on currently available spatial data and represent the most accurate estimates to date. Certain protected habitat estimations presented here are lower than the figures provided in the Louisiana black bear 5-year status review document due to improved data availability and associated methodology, and not to actual reductions in protected habitat.

TABLE 4—CRP WITHIN THE LOUISIANA BLACK BEAR BREEDING HABITAT AND LOUISIANA BLACK BEAR HABITAT RESTORATION PLANNING AREAS, LA (ac [ha])

[*Numbers may not total due to rounding*]

	Tensas River Basin [1]	Upper Atchafalaya River Basin	Lower Atchafalaya River Basin	Total
Breeding Habitat [2 3]	44,766 [18,116]	21,770 [8,810]	0 [0]	66,536 [26,926]
HRPA	120,793 [48,883]	1,344 [544]	11 [5]	122,149 [49,432]

[1] Includes the TRC subpopulation.
[2] Breeding habitat area is largely a subset of (*i.e.,* contained within) the total HRPA.
[3] Breeding habitat areas have expanded beyond the HRPA boundary.

TABLE 5—STATE AND FEDERAL MANAGEMENT AREAS WITHIN THE LOUISIANA BLACK BEAR HABITAT RESTORATION PLANNING AREAS, LA (ac [ha])

[Numbers may not total due to rounding]

	Tensas River Basin [1 2]	Upper Atchafalaya River Basin [2]	Lower Atchafalaya River Basin [2]	Total [2]
NWRs	111,966 [45,311]	17,614 [7,128]	7,426 [3,005]	137,006 [55,444]
WMAs	143,933 [58,248]	59,423 [24,048]	1,474 [597]	204,830 [82,892]
Atchafalaya Basin Floodway Master Plan Easements and Acquisitions [3]	.....	126,417 [51,159]	.....	126,417 [51,159]
Total	255,899 [103,559]	226,037 [91,476]	8,900 [3,602]	480,836 [194,588]

[1] Includes the TRC subpopulation.
[2] Some acreage figures are less than that presented in the Louisiana Black Bear 5-Year Status Review due to property boundary refinements and corrections for certain NWRs and WMAs.
[3] This acreage (126,417) does not equal the 141,400 ac estimated by the Corps (Lacoste 2014). The reason for the apparent discrepancy is that the LDWF has been granted management authority over portions of the 141,400 ac (which include both fee title and easement properties). In our analysis, the management-transfer acreage was credited to LDWF (in the form of WMA acreage) rather than to the Corps. However, the total calculated protected-habitat acreage remains consistent (and accurate) regardless of that management authority reassignment.

TABLE 6—FEDERAL AND STATE NATURAL RESOURCE MANAGEMENT AREAS THAT SUPPORTS LOUISIANA BLACK BEAR BREEDING SUBPOPULATIONS (ac [ha]).

	Tensas River Basin [1]	Upper Atchafalaya River Basin [2 3]	Lower Atchafalaya River Basin	Louisiana total	Mississippi total [4]	Total
NWRs	160,815 [65,079]	16,030 [6,487]	7,355 [2,976]	184,199 [74,543]	4,383 [1,774]	188,582 [76,316]

TABLE 6—FEDERAL AND STATE NATURAL RESOURCE MANAGEMENT AREAS THAT SUPPORTS LOUISIANA BLACK BEAR BREEDING SUBPOPULATIONS (ac [ha]).—Continued

	Tensas River Basin [1]	Upper Atchafalaya River Basin [2 3]	Lower Atchafalaya River Basin	Louisiana total	Mississippi total [4]	Total
WMAs	223,926 [90620]	49,042 [19,846]	0	272,968 [110,466]	0	272,968 [110,466]
Total	384,741 [155,699]	65,071 [26,333]	7,355 [2,976]	457,167 [185,009]	4,383 [1,774]	461,550 [186,783]

[1] Includes the TRC subpopulation and the Louisiana black bear subpopulation in north-central Louisiana near the Arkansas State line.
[2] Includes the Louisiana black bear subpopulation found in the Florida parishes of Louisiana (east of the Mississippi River).
[3] These figures do not include Atchafalaya Basin Floodway Master Plan easements and acquisitions purchased by the Corps, or lands not managed as part of a Federal or State natural resource management area.
[4] Although there are Louisiana black bear breeding subpopulations in Warren, Wilkinson, Issaqueena, and Sharkey Counties, only the Issaqueena/Sharkey subpopulation is currently located by State and Federal lands.

Table 7. Changes in the extent of forested habitat coverage within the Louisiana black bear HRPA between 1998 and 2013.[1]

	Northern Zone[2]	Central Zone[2]	Southern Zone[2]
Percent Increase in Forested Landscape[3]	11.4%	7.6%	7.5%

[1] Data was detected through image classification of digital orthophoto quarter quadrangles (DOQQs; digital orthorectified aerial photography produced at a spatial resolution of 1 meter by the U.S. Geological Survey). Analysis sites were selected to avoid potential bias against landscape features that could result in an underestimation of, or failure to detect, forested habitat losses (e.g., sites with a relatively high proportion of open water, agricultural fields, publicly owned properties, or perpetual conservation easements).
[2] These zones correspond to the general geographic location of our habitat assessment sites within the large-scale monitoring grid presented in the Service's *Draft Post-Delisting Monitoring Plan for the Louisiana Black Bear* (Service 2015, p. 62, Figure 4).
[3] Percentages, rather than acreages, are provided because only a portion of the overall landscape was evaluated. The intent of this assessment is to evaluate habitat trends and not to calculate absolute habitat values.

Table 8. Forested habitat changes between 2001 and 2011[1].

2001 - 2011 Change in Landcover Within the Louisiana Black Bear Habitat Restoration Planning Area	Tensas River Basin	Upper Atchafalaya River Basin	Lower Atchafalaya River Basin	Total
Crops Open Water Other Non-Habitat	-1,833.78	-2,857.42	-4,047.68	-8,738.88
Development	521.93	181.44	362.91	1,066.28
Potential Louisiana Bear Habitat [2]	1,311.85	2,675.99	3,684.77	7,672.61

[1] as detected through satellite-based image classification produced at a spatial resolution of 30 meters within the Louisiana Black Bear Habitat Restoration Planning Area (ac[ha]). The classified image data are formally termed NLCD and are a national land cover product created by the Multi-Resolution Land Characteristics Consortium.
[2] NLCD habitat classes considered potentially suitable for the Louisiana black bear include deciduous forest, woody wetlands, mixed forest, evergreen forest, shrub scrub, emergent herbaceous wetlands, and grassland herbaceous.

In 1992, when the Louisiana black bear was listed, the lack of habitat protection within the Atchafalaya River Basin was considered a significant component of the overall habitat loss threat to Louisiana black bears. The final rule that listed the Louisiana black bear as a threatened subspecies states that ''privately owned lands of the Atchafalaya River Basin south of U.S. 190 may remain exposed to threat from clearing and conversion to agricultural uses'' (Service 1992, p. 591). It further states that approximately one-half of the forests in the northern Atchafalaya River Basin and the Tensas River Basin are ''privately owned and under no protection through conservation easements or acquisition'' (Service 1992, p. 591). The Corps' Feasibility Study for the Atchafalaya Basin Floodway System projected the ''conversion of about 200,000 ac [81,000 ha] of forestland to agricultural land'' within the Lower

Atchafalaya Basin Floodway (Corps 1982, p. 29). Partly in response to that threat, when the Corps' Atchafalaya Basin Multi-Purpose Plan was approved, it authorized the acquisition of more than 300,000 ac (121,000 ha) of non-developmental easements on private lands and the fee-title purchase of more than 50,000 ac (20,000 ha) of land for conservation purposes within the Atchafalaya Basin covering a substantial amount of land between the UARB and the LARB subpopulations (Corps 1983, p. 3). According to the most current Corps' data, approximately 94,000 ac (38,000 ha) of environmental easements have been purchased and 47,400 ac (19,000 ha) of land have been purchased in fee title for conservation purposes within the Basin (Lacoste 2014).

Developmental and environmental provisions of those easements prohibit the conversion of land from existing uses (*e.g.,* conversion of forested lands to cropland). Camp development and timber harvests within the easement area must be conducted in compliance with associated easement restrictions. The current and future acquisition of land (via easement and fee-title purchase) for environmental purposes within the Basin have substantially reduced, and will continue to substantially reduce, the threat of habitat loss within this region of the State. In addition to those protections afforded to existing forested lands, the Service estimated that more than 35,000 ac (14,000 ha) of lakes and cypress-tupelo swamps would convert to higher elevation forests within the Basin by the year 2030 (LeBlanc et al. 1981, p. 65). This prediction is supported by more recent studies documenting increased and ''substantial'' sedimentation within the Basin, to the extent that certain areas exhibit ''the highest documented sedimentation rates in forested wetlands of the United States'' (Hupp et al. 2008, p. 139). Sedimentation results in increased forest floor elevation, and areas currently subject to frequent inundation will eventually reach elevations that are significantly less prone to flooding. Such elevation and hydrology changes are typically accompanied by a shift in vegetative community (reflective of the hydrologic conditions) resulting in habitats that are more suitable for bear foraging and habitation. Such changes could ultimately expand the acreage of suitable habitat for the UARB and LARB subpopulations, and improve habitat linkage and genetic exchange between those groups.

Although trends related to agricultural conversion of forested land have been reversed since the listing of the Louisiana black bear, another possible source of future habitat loss may be development associated with increased urbanization. To assess potential future habitat losses associated with development, we acquired population trend projections for all of the parishes within the Louisiana black bear HRPA. Population projections are available through year 2030; see Table 9. The Louisiana Parish Population Projections Series (2010–2030) were developed by Louisiana State University–Department of Sociology for the State of Louisiana, Office of Information Technology, Division of Administration (*http://louisiana.gov/Explore/Population_Projections/*).

Of the 17 parishes included within our Louisiana Black Bear Habitat Restoration Planning Area, 15 were projected to experience human population declines, including several that may experience substantial reductions (population declines of 10–23 percent). St. Landry and St. Martin Parishes were the only parishes within our analysis polygon with projected population growth over the next 15 years (though increases of only 3.88 and 5.07 percent, respectively, are expected). It should be noted that significant portions of those parishes, including their largest urban areas where most future population growth and associated development would be expected, occur outside of the HRPA. In summary, based on our review of the available human population projections, it appears that there is an extremely low threat of future Louisiana black bear habitat loss from urban expansion or other types of development.

Table 9. Human population projections for Louisiana parishes within the Louisiana Black Bear Habitat Restoration Planning Area.[1]

Parish	Population Projection for 2015	Population Projection for 2030	Number - Population Change	Percent - Population Change
Avoyelles	42,550	42,380	-170	-0.40%
Catahoula	9,400	7,720	-1,680	-17.87%
Concordia	17,160	13,930	-3,230	-18.82%
East Carroll	7,600	5,960	-1,640	-21.58%
Franklin	18,450	15,460	-2,990	-16.21%
Iberia	75,990	75,450	-540	-0.71%
Iberville	29,350	24,640	-4,710	-16.05%
Madison	10,470	8,230	-2,240	-21.39%
Pointe Coupee	21,560	19,380	-2,180	-10.11%
Richland	19,260	17,460	-1,800	-9.35%
St. Landry	94,420	98,080	3,660	3.88%
St. Martin	54,250	57,000	2,750	5.07%
St. Mary	47,410	40,390	-7,020	-14.81%
Tensas	5,200	3,990	-1,210	-23.27%
West Baton Rouge	22,540	21,070	-1,470	-6.52%
West Carroll	10,750	9,190	-1,560	-14.51%
West Feliciana	15,250	14,260	-990	-6.49%
Total Population Change over the Next 15 Years in the 17 Parishes Included in the Louisiana Black Bear Habitat Restoration Planning Area			**-27,020**	
Average Percent Population Change over the Next 15 Years for the 17 Parishes Included in the Louisiana Black Bear Habitat Restoration Planning Area			**-11.13%**	

[1] The effects of Hurricanes Katrina and Rita were considered in all projections. Data represent the "Middle Series" scenario provided by the State of Louisiana, Office of Information Technology, Division of Administration (http://louisiana.gov/Explore/Population_Projections/; downloaded on December 4, 2014).

Summary of Factor A: Under current landscape conditions and forested habitat extent, the subpopulations within the Tensas and Upper Atchafalaya River Basins [specifically the TRB, UARB, and TRC]) have an overall probability of persistence of approximately 100 percent (0.996; Laufenberg and Clark 2014, p. 2). This indicates that current available habitat is sufficient in quality and quantity to meet long-term survival requirements of the Louisiana black bear. Much of that habitat is protected and the extent of protected habitat continues to increase. Since the listing of the Louisiana black bear in 1992, voluntary landowner-incentive based programs and environmental regulations have not only stopped the net loss of forested lands in the LMRAV, but have resulted in significant habitat gains within both the LMRAV and the Louisiana black bear HRPA. We do not have any data indicating that future enrollment in voluntary landowner-incentive based programs would deviate significantly from recent historic trends.

There is also a substantial amount of private land that supports Louisiana black bears, but that is not encumbered by conservation easements. To conservatively estimate long-term habitat availability for the Louisiana black bear, those lands were excluded from much of our analyses (Tables 2, 3, 5, and 6). It should be noted, however, that those lands largely consist of forested habitats that are occasionally to frequently flooded and would not be suitable for conversion to agriculture or development without the construction of significant flood control features. The construction of such features or other activities that would eliminate or reduce existing wetland habitat (including forested wetlands), and would be regulated via The Food Security Act of 1985 and/or Section 404 of the CWA (refer to the *Factor D* section for further discussions on long-term protections afforded to private land through existing regulatory mechanisms). Due to the increase in available and restored habitat following the listing of the Louisiana black bear, including more than 460,000 ac (186,000 ha) held in Federal and State ownership, the protection of a substantial portion of restored habitats with perpetual non-developmental easements (through the WRP or wetland mitigation banking programs), and the protection of remnant and restored forested wetlands through applicable conservation regulations (*e.g.,* Section 404 of the CWA), we find that the present or threatened destruction, modification, or curtailment of its habitat or range is no longer a threat to the Louisiana black bear.

Factor B. Overutilization for Commercial, Recreational, Scientific, or Educational Purposes

Hunting During the Past 23 Years: In addition to habitat loss, prior to listing, Louisiana black bear numbers had been reduced throughout its range due to historical overexploitation (Barker et al. 2005, p. 3; Davidson et al. 2015, p. 3; St. Amant 1959, p. 42; Shropshire 1996, p. 20). For example, Keul (2007, p. i) reviewed historical literature on the black bear in East Texas and concluded the primary reason for loss of bears was due to aggressive and uncontrolled sport hunting. Currently, there are no legal commercial or recreational consumptive uses of Louisiana black bears. In the mid-1950s, the bear hunting season in Louisiana was temporarily closed due to low bear numbers (Davidson et al. 2015, p. 5). In spite of low numbers, bear hunting remained legal for short time periods in restricted areas of Louisiana until 1988, when the season was once again closed; it has not since reopened (Davidson et al. 2015, p. 5; Murphy, 2015, personal communication). Additional protection was provided by the State listing of the Louisiana black bear (listed as threatened in Louisiana in 1992, as endangered in Mississippi in 1984, and as threatened in Texas in 1987) (refer to the Factor D section for further discussions on regulatory mechanisms).

Hunting in the Future: Should the Louisiana black bear be delisted and the accompanying protection afforded under the Act removed, the bear would remain protected under State law and the State penalties for poaching or harming a Louisiana black bear would remain in place (see *Factor D discussion*) (Davidson et al. 2015, p. 57). This includes protection that would remain in place for all bear species. After the bear is no longer protected by the ESA, however, the legal harvest of bears, with approval from the Louisiana Wildlife and Fisheries Commission, could occur in Louisiana based on demographic monitoring data (Davidson et al. 2015, p. 55). Based on the 2015 Louisiana black bear management plan, LDWF has the authority, capability, and biological data to implement careful hunting restrictions and population management (Davidson et al. 2015, p. 55). If this rule is finalized, the LDWF would only consider the possibility of a limited hunt through a quota system, allocated by management area, based on harvest models accounting for such things as demographics, reproductive vital rates, genetic characteristics, and the magnitude of human-caused mortality (Davidson et al. 2015, pp. 55–56). Baseline estimates would be established for every Louisiana black bear subpopulation, and population monitoring would be conducted (Davidson et al. 2015, p. 55). The baseline estimates and population monitoring would be based on the extensive data and monitoring methods developed by LDWF and described in the PDM. The LDWF management plan states that no regulated hunt would be allowed if it compromises Louisiana black bear sustainability (Davidson et al. 2015, p. 55). Harvest seasons cannot be set without Louisiana Wildlife and Fisheries Commission approval and a public review and comment period. If approved, the harvest would be monitored by the LDWF, who would also reserve the right to revoke tags and/or cancel harvest seasons at any time (Davidson et al. 2015, p. 55).

Scientific Research and Public Safety: Bears are routinely captured and monitored for scientific and public safety purposes. During scientific research activities, there is a rare chance a bear could be accidentally killed during the capture process, but these activities are conducted via State permits and closely monitored by the State agencies to reduce the likelihood of such events. Since listing in 1992, in Louisiana there have been at least 8 documented mortalities incidental to research activities (USGS et al. 2014) and 15 euthanizations due to conditioning to anthropogenic food sources and subsequent human habitation (Davidson et al. 2015, p. 15). In Mississippi, two research-related deaths have occurred since listing (Rummel 2015, personal communication).

Summary of Factor B: The small number of mortalities occurring from research activities or removal due to public safety concerns does not represent a significant threat to the Louisiana black bear population. In addition, recreational hunting is not a threat because there has been no existing functional mechanism to hunt or take bears in the States in its range since 1984 (refer to *Factor E discussion* for a discussion of mortality due to poaching). Also if this rule is finalized, bear species would remain protected in the States where the Louisiana black bear occurs through State regulations so there is no identified threat to the Louisiana black bear (refer to *Factor D discussion* for a discussion of regulations that will remain in place). Therefore, the associated protections afforded to the American black bear due to similarity of appearance will no longer be necessary. The potential for a regulated restricted harvest of the Louisiana black bear population exists. The LDWF would not consider a harvest if existing data and simulated population dynamics models indicate a restricted hunt could potentially compromise Louisiana black bear sustainability. Louisiana's State management plan has measures in place to ensure the Louisiana black bear population would not be impacted. Based on this, we do not have any evidence to suggest that overutilization is a threat to the Louisiana black bear.

Factor C. Disease or Predation

When we listed the Louisiana black bear in 1992, we did not consider disease or predation to be limiting or threatening to the Louisiana black bear (57 FR 588). Several diseases and parasites have been reported for black bears but are not considered to have significant population impacts (Pelton 2003, p. 552). Limited information has been collected in the wild on diseases or parasites of black bears and causes of cub mortality (LeCount 1987, p. 75). Natural predation has been documented as a result of cannibalism by other bears and cub predation by other animals (LeCount 1987, pp. 77–78; Rogers 1987, p. 54; Pelton 2003, p. 552). Rogers (1987, pp. 53–54) documented four yearling bears that had been eaten (including one that had been eaten by its mother) but could not determine if they had been killed or scavenged and noted that small bears in poor condition would be more susceptible to predation. Cannibalism rates are not likely to regulate population growth (Rogers 1987, p. 55). It is unknown how many juvenile males are killed (rather than dispersed from the area) by adults, but that mortality probably has little effect population growth due to the polygamous (having more than one mate) mating system of bears (Rogers 1987, p. 55). O'Brian's (2010, p. 17), literature review of black bear disease indicated bears may be susceptible to a number of parasitic, bacterial, and viral diseases but none are likely to cause high morbidity or mortality. Similarly, Pelton (1982, p. 511) listed the following diseases of black bears—liposarcoma and unidentified tumors, Elokomin fluke, rabies, and several bacterial and parasitic infestations—noting that none appeared to have significant effects on population regulation and LeCount (1987, p. 79) did not believe disease represented a substantial mortality factor for bear populations. Disease vectors are monitored by the LDWF whenever bears are handled.

Summary of Factor C: We have no evidence or data indicating that disease or predation present a threat to the Louisiana black bear population.

Factor D. The Inadequacy of Existing Regulatory Mechanisms

Louisiana: Overharvest was identified as one of the factors that resulted in low Louisiana black bear numbers. Currently, in addition to protections afforded by the Act, Louisiana black bears are protected from take (''Take'' is defined in Louisiana law at Title 56:8(131): In its different tenses, as the attempt or act of hooking, pursuing, netting, capturing, snaring, trapping, shooting, hunting, wounding, or killing by any means or device.), possession, and trade by State laws throughout its historical range (Louisiana: Title 56, Chapter 8, Part IV. Threatened or Endangered Species; Mississippi: Title 49, Chapter 5—Fish, Game and Bird Protections and Refuges, Nongame Endangered Species Conservation); Texas: Title 5. Wildlife and Plant Conservation, Subtitle B. Hunting and Fishing, Chapter 68. Endangered Species). The LDWF will be the sole agency responsible for Louisiana black bear management in Louisiana if the bear is delisted. The potential removal of the Louisiana black bear from protection under the Act would not alter or negate State laws or penalties protecting the bear. In Louisiana, there are nine laws and regulations

authorized under Louisiana Title 56 and Louisiana Title 76 regulating and setting violation classes for such things as taking, possessing, and feeding (Davidson et al. 2015, pp. 57–59). The LDWF Law Enforcement Division (LED) is responsible for enforcing State and Federal laws relative to fish and wildlife resources. In fiscal year 2012–2013, the LED conducted 226,427 patrol hours on land and made 730,942 contacts with the public, the majority of whom were in compliance with State and Federal wildlife and fisheries regulations (LDWF 2014a, p. 2). Agents issued more than 20,000 criminal citations and 5,700 warnings during this period, with the most common related to actions like fishing without a license, or not abiding by rules and regulations on wildlife management areas (see Factor E for a discussion of documented illegal poaching). In the last 10 years, the LDWF enforcement division has prosecuted seven black bear cases (M. Davidson, 2015, LDWF, personal communication). Operation Game Thief (OGT) is a non-profit corporation program that provides cash awards to individuals who provided LDWF with information regarding a wildlife violation that result in an arrest. Since its inception in 1984, over 700 violators, convicted of numerous State and Federal charges, have been apprehended as a result of information provided by OGT informants (LDWF 2015, *http://www.wlf.louisiana.gov/enforcement/operation-game-thief*).

The LDWF Louisiana Black Bear Management Plan (Plan) was finalized in 2015 (Davidson et al. 2015). The management objective for that Plan is to maintain a sustainable black bear population in suitable habitat and has the following key requirements: Sufficient habitat available within dispersal distance, maintaining connectivity among subpopulations, and continued monitoring of subpopulation demographics (Davidson et al. 2015, p. 2). The LDWF identified three bear management actions it will implement: (1) Continued public education and outreach; (2) minimizing human–bear conflicts; and (3) bear harvest as a management action if such actions do not impede sustainability of bears (as determined by the ongoing population monitoring program as described in the LDWF Black Bear Management Plan (Davidson et al. 2015, p. 32–33, 55–56).

Mississippi: The Mississippi Department of Wildlife, Fisheries, and Parks will be the agency responsible for black bear management in Mississippi if the bear is delisted. MDWFP developed a management plan entitled ''Conservation and Management of Black bears in Mississippi'' in 2006 (Young 2006). The purpose of that plan was to: (1) Serve as a basis for information about black bears in Mississippi; and (2) outline protocols and guidelines for dealing with the continued growth of black bear populations in Mississippi (Young 2006, p. 6). That plan covered black bear habitat management and restoration needs, public education, conflict management, and research needs (Young 2006, pp. 25–36).

Texas: The TPWD will be the agency responsible for black bear management in Texas if the bear is delisted. An East Texas Black Bear Conservation and Management Plan was developed in 2005 (Barker et al. 2005). Its purpose is to facilitate the conservation and management of black bears in East Texas through cooperative efforts. Broadly described components of the plan include: Habitat management and enhancement, public education, conflict management, and research needs (Barker 2005, pp. 31–41). Louisiana black bears currently do not exist in Texas; however, this Plan contains a framework to improve habitat and provide possibilities for future bear conservation in the State.

State-owned Lands: The LDWF is responsible for administering the many State-owned wildlife management areas in Louisiana. The WMAs within the HRPA include Big Lake WMA (19,587 ac (7,927 ha)), Buckhorn WMA (11,238 ac (4,548 ha)), Richard K. Yancy WMA (73,433 ac (29,717 ha)), and Grassy Lake WMA (13,214 ac (5,348 ha)), Sherburne WMA and the adjacent (State-managed) Corps-owned Bayou Des Ourses Area (29,883 ac (12,093 ha)), and Attakapas Island WMA (26,819 ac (10,854 ha)). Those areas are managed according to the LDWF Master Plan for Wildlife Areas and Refuges (LDWF 2014a). The vision identified is to build an interconnected system of natural areas and open spaces (a green infrastructure) consisting of core areas (*e.g.,* NWRs and WMAs), and corridors to provide essential habitat to endangered and threatened species as well as other species important to ecosystem function (LDWF 2014b, p. 18). Implementation of the strategic plan includes potential land acquisition in support of threatened and endangered species, cooperating with the Service in the recovery of listed species, and restoration of BLH forest habitat (LDWF 2014b, p. 16).

The MDWFP is responsible for administering the many State-owned wildlife management areas in Mississippi. The WMAs within the MAVU include Leroy Percy WMA (2,664 ac (1,078 ha)), Shipland WMA (4,269 ac (1,728 ha)), Copiah County WMA (6,830 ac (2,764 ha)), and O'Keefe WMA (5,918 ac (2,395 ha)). Those areas are managed according to the MDWFP Strategic Plan (MDWFP undated, p. 17) and are actively managed to provide for a diversity of wildlife species. The management goals are to manage agency-owned lands for the long-term conservation of wildlife habitat and for multiple user groups to enjoy diverse outdoor recreational opportunities that are consistent with natural resource management goals.

U.S. Fish and Wildlife National Wildlife Refuges: The NWRs shown in the following table (see Table 10) occur within the Louisiana HRPA and the Mississippi MAVU.

Table 10. Extent of NWR lands occurring within the Louisiana HRPA and the Mississippi MAVU.

	Acres	Hectares
Louisiana NWRs		
Atchafalaya NWR	15,764	6,379
Bayou Cocodrie NWR	15,149	6,131
Bayou Teche NWR	9,004	3,644
Tensas River NWR	77,956	31,548
Lake Ophlia NWR	17,427	7,052
Louisiana Total	***135,300***	***54,754***
Mississippi NWRs		
Coldwater River NWR	283	115
Hillside NWR	15,498	6,272
Matthews Brake NWR	2,393	968
Morgan Brake NWR	7,585	3,070
Panther Swamp NWR	40,859	16,535
St. Catherine Creek NWR	25,384	10,273
Tallahatchie NWR	24	10
Theodore Roosevelt NWR	6,019	2,436
Yazoo NWR	13,050	5,281
Mississippi Total	***111,095***	***44,959***
TOTAL FOR BOTH STATES	***246,395***	***99,713***

The National Wildlife Refuge System Improvement Act of 1997 requires that every refuge develop a Comprehensive Conservation Plan (CCP) and revise it every 15 years, as needed. CCPs identify management actions necessary to fulfill the purpose for which an NWR was enacted. CCPs allow refuge managers to take actions that support State Wildlife Action Plans, improve the condition of habitats, and benefit wildlife. The current generation of CCPs will focus on individual refuge actions that contribute to larger, landscape-level goals identified through the Landscape Conservation Design process. CCPs address conservation of fish, wildlife, and plant resources and their related habitats, while providing opportunities for compatible wildlife-dependent recreation uses.

An overriding consideration reflected in these plans is that fish and wildlife conservation has first priority in refuge management, and that public use be allowed and encouraged as long as it is compatible with, or does not detract from, the Refuge System mission and refuge purpose(s). Each NWR within the Louisiana black bear range addresses management actions for maintaining appropriate bear habitat on their lands as follows: Tensas River NWR (Service 2009a, pp. 77–78); Bayou Teche NWR (Service 2009b, p. 34); Atchafalaya NWR (Service 2011, pp. 68–75); Grand Cote NWR (Service 2006a, p. 54); Upper Ouachita NWR (Service 2008, pp. 85–86); Lake Ophelia NWR (Service 2005a, pp. 49–50); Bayou Cocodrie NWR (Service 2004, p. 40); Hillside, Matthews Brake, Morgan Brake, Panther Swamp, Theodore Roosevelt, and Yazoo NWRs (Service, 2006c, pp. 92–93); Coldwater and Tallahatchie NWRs (Service 2005b, pp. 78–79); and St. Catherine Creek NWR (Service 2006b, p. 58).

Morganza and Atchafalaya Basins: The lands in the Atchafalaya Basin and Morganza Floodway are prominent features of the Mississippi River and Tributaries flood control project authorized by the Flood Control Act of May 15, 1928. In 1985, the Corps enacted the Atchafalaya Basin Multipurpose Plan with the purpose to protect south Louisiana from Mississippi River floods and to retain and restore the unique environmental features and long-term productivity of the Basin. The purpose of the Morganza Floodway is to provide a controlled floodway to divert Mississippi River flood waters into the Atchafalaya basin during major floods on the Mississippi River. The Corps has acquired fee title ownership and permanent easements of approximately 600,000 ac (200,000 ha) for perpetual flowage, developmental control and environmental protection rights. The developmental control and environmental protection easement prohibits conversion of land from existing uses (*e.g.,* conversion of forested lands to cropland). Landowners may harvest timber only in compliance with specified diameter-limit and species restrictions. The construction or placement of new, permanently habitable dwellings or other new structures, including camps, except as approved by a Corps real estate camp consent and in accordance with Corps restrictions, is prohibited on the easement lands in the Atchafalaya Basin.

NRCS Administered Permanent Conservation Easements on Private Lands: The WRP is a voluntary program that provides eligible landowners the opportunity to address wetland, wildlife habitat, soil, water, and related natural resource concerns on private lands in an environmentally beneficial and cost-effective manner. The WRP is authorized by 16 U.S.C. 3837 *et seq.,* and the implementing regulations are found at 7 CFR part 1467. The first and foremost emphasis of the WRP is to protect, restore, and enhance the functions and values of wetland ecosystems to attain habitat for migratory birds and wetland-dependent wildlife, including threatened and endangered species. The WRP is administered by the Natural Resources Conservation Service (NRCS) (in agreement with the Farm Service Agency) and in consultation with the Service and other cooperating agencies and organizations. The Service participates in several ways, including assisting NRCS with land eligibility determinations; providing the biological information for determining environmental benefits; assisting in restoration planning such that easement lands achieve maximum wildlife benefits and wetland values and functions; and providing recommendations regarding the timing, duration, and intensity of landowner-requested compatible uses.

Participating landowners may request other prohibited uses such as haying, grazing, or harvesting timber. When evaluating compatible uses, the NRCS evaluates whether that proposed use is consistent with the long-term protection and enhancement of the wetland resources for which the easement was established and Federal funds expended. Requests may be approved if the NRCS determines that the activity both enhances and protects the

purposes for which the easement was acquired and would not adversely affect habitat for migratory birds and threatened and endangered species. NRCS retains the right to cancel an approved compatible use authorization at any time if it is deemed necessary to protect the functions and values of the easement. According to the authorizing language (16 U.S.C. 3837a(d)), compatible economic uses, including forest management, are permitted if they are consistent with the long-term protection and enhancement of the wetland resources for which the easement was established. Should such a modification be considered, NRCS would consult with the Service prior to making any changes.

According to the WRP Manual, prior to making a decision regarding easement modification, the Natural Resources Conservation Service (NRCS) must:

(1) Consult with the Service;

(2) evaluate any modification request under the National Environmental Policy Act (NEPA);

(3) investigate whether reasonable alternatives to the proposed action exist; and

(4) determine whether the easement modification is appropriate considering the purposes of WRP and the facts surrounding the request for easement modification or termination.

Any WRP easement modification, must:

(1) Be approved by the Director of the NRCS in consultation with the Service (the National WRP Program Manager must coordinate the consultation with the Service at the national level);

(2) not adversely affect the wetland functions and values for which the easement was acquired;

(3) offset any adverse impacts by enrolling and restoring other lands that provide greater wetland functions and values at no additional cost to the government;

(3) result in equal or greater ecological (and economic) values to the U.S. Government;

(4) further the purposes of the program and address a compelling public need; and

(5) comply with applicable Federal requirements, including the Act, NEPA (42 U.S.C. 4321 *et seq.*), Executive Order 11990 (Protection of Wetlands), and related requirements.

The WRP manual states that ''NRCS will not terminate any of its easements, except for a partial termination that may be authorized as part of an easement modification request. . .in which additional land will be enrolled in the program in exchange for the partial termination.'' Therefore, based on our assessment of these requirements, the termination of an entire WRP easement, or a reduction in the total acreage of WRP lands via authorized modifications, appears highly improbable. In addition, we have partnered with NRCS to administer WRP in Louisiana since the inception of that program in 1992. Following a comprehensive review of our local files and a search of national WRP records, we have been unable to find a single instance of a WRP easement being terminated in the history of that program (which includes nearly 10,000 projects on approximately 2 million ac (800,000 ha) of land nationwide).

Food Security Act Regulations: The Food Security Act of 1985 included Highly Erodible Land Conservation and Wetland Conservation Compliance (*i.e.,* ''Swampbuster'') provisions to deter forested wetland loss by withholding many Federal farm program benefits from producers who convert wetland areas to agricultural purposes. Persons who convert a wetland and make the production of an agricultural commodity possible are ineligible for NRCS program benefits until the functions of that wetland were restored or mitigated. According to the NRCS, those wetland conservation provisions have sharply reduced wetland conversion for agricultural uses (*http://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/national/programs/alphabetical/camr/?cid=stelprdb1043554*).

Partners for Fish and Wildlife Act Regulations: The Partners for Fish and Wildlife Act of 2006 provides for the restoration, enhancement, and management of fish and wildlife habitats on private land through the Partners for Fish and Wildlife Program, a program that works with private landowners to conduct cost-effective habitat projects for the benefit of fish and wildlife resources in the United States. This program provides technical and financial assistance to private landowners for the conduct of voluntary projects to benefit Federal trust species by promoting habitat improvement, habitat restoration, habitat enhancement, and habitat establishment, as well as technical assistance to other public and private entities regarding fish and wildlife habitat restoration on private lands. Numerous projects providing direct habitat benefits for the Louisiana black bear have been accomplished via the Partners for Fish and Wildlife Program. One such example involves a 120-acre site within Louisiana black bear breeding and critical habitat. Because it is also located within the Morganza Floodway (which is encumbered with a Corps flowage easement), the site was ineligible for most other habitat restoration programs such as WRP. Prior to enrollment into the Partners for Fish and Wildlife Program, that site was maintained as a marginally productive agricultural field. In 2002, through the planting of a diverse mixture of over 36,000 native seedlings, the entire site was restored to a bottomland hardwood forest, reducing fragmentation and providing habitat benefits for a variety of species including the Louisiana black bear.

Clean Water Act Regulations: For the first several years following the passage of the CWA (enacted as the Federal Water Pollution Control Act Amendments of 1972), the Corps only regulated activities that clearly constituted a deposition of dredge and fill material in wetlands or other waters of the United States. Subsequently, large-scale clearing of BLH wetlands was largely unregulated during this era (Houck 2012, pp. 1495–1503).

In response to the considerable wetland habitat conversion throughout the LMRAV, and fueled by the ongoing clearing of the Lake Long tract, the Avoyelles Sportsmen's League and partnering organizations sued the Corps and EPA for allegedly failing to properly enforce Section 404 of the CWA. On March 12, 1981, a U.S. District Court (Western District of Louisiana–Alexandria Division) ruled in favor of the plaintiffs with a decision that would substantially alter the regulatory scope and enforcement authority of the Corps and EPA under the CWA. The decision noted: (1) The term ''wetland vegetation'' was more broadly defined which would ultimately result in the reclassification of many areas that were previously considered non-wetland (such as the Lake Long tract), and (2) the Corps' and EPA's jurisdiction were expanded beyond the limited scope of dredge and fill regulation to include all activities that may result in the placement or redistribution of earthen material, such as mechanized land clearing *(Avoyelles Sportsmen's League, Inc.* v. *Alexander,* 511 F. Supp. 278, (W.D. La. 1981)).

To summarize, though the CWA was enacted in 1972, it was a full decade later before the authority and associated protection that it affords to forested wetlands was legally recognized. In the interim, and in the decade prior, the BLH forests of the LMRAV were decimated (Creasman et al. 1992; Haynes 2004, pp. 170, 172) ultimately constituting the primary threat that warranted the listing of the Louisiana black bear (Service 1992, p. 592). After

the new legal protection of forested wetlands defined via the Avoyelles Sportsmen's League rulings on CWA authority, the trajectory of BLH forest loss in the LMRAV was reversed. Available data regarding the extent of forested wetlands in the LMRAV (*e.g.* image classification of digital orthophoto quarter quadrangles [DOQQs], analysis of NLCD data, and government agency records for forested habitat restoration in the LMRAV [via programs such as WRP, CRP, and wetland mitigation banking (see below)] clearly demonstrate that trend reversal and suggest that the long-term protection of forested wetlands (largely absent prior to the Avoyelles Sportsmen's League rulings of the early 1980s) are now being realized (See discussion under *Factor A* above).

Mitigation banking has been an additional factor responsible for alleviating wetland losses associated with the Corps' wetland regulatory program. Persons obtaining a wetland development permit from the Corps (pursuant to Section 404 of the CWA and/or Section 10 of the Rivers and Harbors Act) that authorizes impacts to waters of the United States, including wetlands, are typically required to compensate for wetland losses in a manner that ensures project implementation would result in no net loss of wetlands. Mitigation banks are intended to provide a mechanism to assist permit applicants, who may be unable or unwilling to implement an individual compensatory mitigation project, in complying with those mitigation requirements. The design and implementation of compensatory wetland mitigation projects (particularly wetland mitigation banks) are accomplished through a coordinated effort among the Corps, the Service, and other State and Federal environmental resource management agencies, and are individually authorized by a mitigation banking instrument (MBI). With a high degree of specificity, MBIs mandate restoration practices, contingencies and remedial actions, long-term monitoring and maintenance, adherence to performance standards, financial assurances, and the establishment of perpetual conservation servitudes. Without exception, wetland mitigation banks are restored and managed with the intent of providing the full array of wetland functions and values (such as providing habitat for a multitude of wildlife species, which typically includes the Louisiana black bear).

For permitted projects that would impact Louisiana black bear habitat, the Service routinely requests that any associated wetland mitigation project (or wetland mitigation bank option) be sited in a location, and conducted in a manner, that would result in the restoration of suitable Louisiana black bear habitat including all of the various functions that would be potentially impacted by the corresponding development project (*e.g.,* travel corridors or breeding habitat). The quality/functionality of habitat restored through such conservation efforts, coupled with typical compensatory mitigation ratios, outweighs any loss resulting from individual development projects.

Our analysis of impacts and mitigation associated with the Corps' wetland regulatory program suggests that substantially more forested habitat is restored through compensatory wetland mitigation than is eliminated via permitted wetland development projects (Table 11). That analysis was conducted over a 5-year period spanning July 1, 2009 through July 31, 2014. According to personnel within the Corps wetland regulatory program, a standardized electronic database to track permitted projects was not developed until 2004, and was not reliably used by permit analysts until 2009. Therefore, there is no reliable database for which to query such records prior to that time. It should also be noted that the corresponding table displays permitted wetland losses and approved wetland mitigation banks that would be available to offset those losses. We were unable to obtain the baseline data necessary to calculate a loss-to-gain wetland habitat ratio. However, personnel within the Corp's wetland regulatory program evaluated their records for specific mitigation requirements associated with each permitted activity and estimated that the ratio of wetland habitat gains from compensatory mitigation to wetland habitat losses attributed to permitted projects is 6:1 (Stewart 2014).

Table 11. Impacts (positive/negative) to potentially suitable Louisiana black bear habitat resulting from permitted losses and mitigation gains through the Corps' wetland regulatory program.

IMPACTS Number of Permits Issued via the Corps' Wetland Regulatory Program for Projects in Potentially Suitable Bear Habitat within the Louisiana Black Bear Habitat Restoration Planning Area	New Orleans District	Vicksburg District	*Total*
Projects Resulting in Permanent Impacts	137	79	216
Projects Resulting in Temporary Impacts	411	32	443
Total	**548**	**111**	**659**
Acres of Potentially Suitable Bear Habitat within the Louisiana Black Bear Habitat Restoration Planning Area Impacted/Lost by Projects Permitted via the Corps' Wetland Regulatory Program			
Permanent Impacts	221.8	37.8	259.6
Temporary Impacts	262.7	10.0	272.7
Total	**484.5**	**47.8**	**532.3**
MITIGATION			
Number of Compensatory Wetland Mitigation Banks Approved by the Corps within the Louisiana Black Bear Habitat Restoration Planning Area	7	7	14
Acres of All Habitats Restored, Enhanced, and Preserved via Wetland Mitigation Banking within the Louisiana Black Bear Habitat Restoration Planning Area	2,633.8	2,630.7	**5,264.5**
Acres of Forested Habitat Restored via Wetland Mitigation Banking within the Louisiana Black Bear Habitat Restoration Planning Area	2,323.3	2,538.7	**4,862.0**
NET ACRES OF FORESTED HABITAT GAINED	1,838.8	2,490.9	***4,329.7***

[1] Analysis conducted by the Service's Louisiana Field Office based on regulatory program data (from a 5-year period spanning July 1, 2009 through July 31, 2014) provided by the New Orleans and Vicksburg Corps Districts.

The results of our GIS landscape analysis indicate that the recent (post 1990) positive trends in forested habitat extent within the LMRAV (as documented above) have also been realized within our more focused HRPA. Regardless of our methodology (1-meter DOQQ analysis or 30-meter NLCD analysis), the analyses yielded similar results. There has been a significant gain in the acreage of potential Louisiana black bear habitat within the HRPA since the 1992 listing of the Louisiana black bear (Tables 7 and 8). Our review of available literature and research, in conjunction with our own analyses, suggest that those gains are the result of both voluntary private land restoration programs (mainly CRP and WRP) and wetland regulatory mechanisms (primarily Section 404 of the CWA).

The documented trends in Louisiana black bear population growth, population viability, and increase in the extent of forested habitat further validate the assertion that existing environmental regulatory mechanisms and conservation measures are sufficient for the Louisiana black bear. We do not have any other data indicating that current regulatory mechanisms are inadequate to provide long-term protection of the Louisiana black bear and its habitat. Accordingly, we conclude that existing regulatory mechanisms are adequate to address the threats to the Louisiana black bear posed by the other listing factors, especially habitat loss.

Summary of Factor D: Louisiana black bears are currently, and will continue to be, protected from taking, possession, and trade by State laws throughout their historical range (Louisiana: Title 56, Chapter 8, Part IV. Threatened or Endangered Species; Mississippi: Title 49, Chapter 5—Fish, Game and Bird Protections and Refuges, Nongame Endangered Species Conservation); Texas: Title 5. Wildlife and Plant Conservation, Subtitle B. Hunting and Fishing, Chapter 68. Endangered Species).

Regulatory mechanisms that currently protect Louisiana black bear habitat through conservation easements or ownership by State and Federal agencies will remain in place (*e.g.,* WRP tracts, WMAs, NWRs, FmHAs, and Corps easements in the Atchafalaya and Morganza Floodways). Forested wetlands throughout the range of the Louisiana black bear habitat that are not publicly owned or encumbered by conservation easements will continue to receive protection through Section 404 of the CWA and the ''Swampbuster'' provisions of the Food Security Act of 1985. Forested habitat trends in the LMRAV indicate that those regulations have provided adequate long-term protection of Louisiana black bear

habitat since the listing of the Louisiana black bear in 1992. Specifically, the trajectory of BLH forest loss in the LMRAV has not only improved, but has been reversed with substantial gains in forested habitat being realized within both the LMRAV and the more restrictive HRPA. Therefore, we find that existing regulatory mechanisms are adequate to address the threats to the Louisiana black bear posed by the other listing factors.

Factor E. Other Natural or Manmade Factors Affecting Its Continued Existence

When we listed the Louisiana black bear, the Service discussed what at the time appeared to be a threat from hybridization resulting from the introduction of bears from Minnesota (57 CFR part 588). We noted that the threat from hybridization at the subspecies level might not be a cause for significant concern and acknowledged that the subpopulations in the TRB and UARB were possibly intraspecifically hybridized and mostly unchanged (genetically) because of the low probablitity of reproductive isolation since they were relatively close geographically. Reproductive isolation is required for an extended period for the evolutionary process of differentiation to operate (57 CFR part 588). At that time, genetic investigations did not identify real differences in subpopulations and the Service noted that, to the extent a pure genetic heritage is a realistic concept when applied to a subspecies not likely to be reproductively isolated, the threat may have existed. Subsequent studies have revealed differing results on the extent of hybridization. The most recent unified analyses of genetic data by Laufenberg and Clark (2014, pp. 50–58) found varying levels of genetic structure among pairs of subpopulations and identified five genetically distinct groups (Laufenberg and Clark 2014, p. 60) and an affinity between Minnesota and UARB subpopulations (Laufenberg and Clark 2014, p. 84).

The analyses concluded that differentiation between the Louisiana black bear subpopulations within the LMRAV can be explained as the result of restricted gene flow, accelerated genetic drift, and differing levels of genetic introgression as a result of the Minnesota introductions (Laufenberg and Clark 2014, p. 84). The results also show some interchange of Louisiana black bear subpopulations with Arkansas populations and found affinities to the WRB subpopulation and Minnesota bears. The level of genetic affinity or differentiation between the Louisiana black bear subpopulations and the WRB subpopulation and Minnesota bears is not sufficient evidence for determining taxonomic status (Laufenberg and Clark 2014, p. 85). Thus, while recent genetic analyses results did indicate the existence of some effects of the Minnesota reintroductions (as postulated at listing), those effects do not seem to be great enough to pose a significant threat to this subspecies' genetic integrity by hybridization as speculated at listing. In fact, genetic exchange that is occurring among bears from Louisiana, Mississippi, and Arkansas can be considered a positive genetic and demographic contibution to the Louisiana black bear (Laufenberg and Clark 2014, p. 85) (see the Distribution and Taxonomy discussion of the Species Information Section).

Davidson et al. (2015, p. 15) described the Louisiana black bear as susceptible to drowning, maternal abandonment of cubs, and climbing accidents; but the remaining leading cause of black bear mortalities is human-related (Pelton 2003, p. 552; Simek et al. 2012, p. 164; Laufenberg and Clark 2014, p. 76). Increased movement during food shortages substantially increases their chances for human encounters and human-related mortality (Rogers 1987, p. 436; Pelton 2003, p. 549). These mortality rates are suspected to be greater for yearling and subadult black bear males dispersing from the family unit, and are probably the result of starvation, accidents (*e.g.,* vehicular collisions), and poaching.

Since listing in 1992, at least 246 black bears have been killed in vehicular collisions in Louisiana (USGS et al. 2014) and 11 bears killed in Mississippi (Rummel 2015, personal communication) making this the leading known cause of death for Louisiana black bears (Davidson et al. 2015, p. 15). In spite of these numbers, black bear populations have increased over this same time period. Black bear population growth in conjunction with urban expansion and habitat fragmentation has resulted in the increased availability of anthropogenic foods sources (Davidson et al. 2015, p. 15). Conflict management of black bears exhibiting nuisance behavior can result in mortality and, in the rare case where a bear cannot be left in the wild (as a result of nuisance behavior resulting in a demonstrable threat to human safety), it may be captured and placed into permanent captivity by management agencies or humanely euthanized. LDWF personnel have euthanized 15 black bear since 1992 (Davidson et al. 2015, p. 15).

The listing rule for the Louisiana black bear (57 FR 588) identified illegal kill as a potential threat to this species that could not be ruled out until better data could be obtained. The majority of illegal kills have been the result of direct poaching; however, there have been 3 documented mortalities incidental to the use of snares in Louisiana for nuisance animal control (Davidson, M. 2015, LDWF, personal communication). Since 1992, there have been 32 documented illegal bear killings in Louisiana (Davidson et al. 2015, p. 15) and 9 documented in Mississippi (Rummel 2015, personal communication). If all other documented deaths of unknown causes are assumed to be the result of illegal taking, a total of 75 bears have been documented as killed since listing (USGS et al. 2014). Taken altogether, since Federal listing, approximately 300 individual Louisiana black bears are known to have been killed as a result of anthropogenic conflicts in Louisiana (USGS et al. 2014), and in Mississippi, 22 bears have been reported killed (Rummel 2015, personal communication), or approximately 13 bears per year have succumbed to anthropogenic causes of mortality since 1992 in Louisiana (Davidson et al. 2015, p. 16) and approximately 1 bear per year in Mississippi (Rummel 2015, personal communication).

Hurricanes and tropical storms can affect forested habitat throughout the LMARV. The potential effects of any tropical storm event will depend on where it makes landfall and what area is receiving the brunt of the wind and force of the cyclone. They can also have additional negative effects to the LARB subpopulation due to its proximity to the coast; however, they are deemed to be a low magnitude because of the Louisiana black bear's ability to quickly adapt and move while using a variety of habitats. Murrow and Clark (2012) studied the impacts of Hurricanes Katrina and Rita on habitat of the LARB subpopulation. They did not detect in their research any significant direct impacts to forested habitat. For example, suitable bear habitat was found to have decreased only by 0.9 percent (from 348 to 345 square kilometers (km^2)) within the occupied study area and only 1.4 percent (from 34,383 to 33,891 km^2) in the unoccupied study area following the hurricanes. The analysis showed that bear habitat was not significantly degraded by the hurricanes and the effects of wind and storm surge that came with them. Hurricane Katrina represents the highest recorded storm

surge in the Southeast. If hurricane events occur during the seven year PDM monitoring period, we will assist our State partners in monitoring the possible effects of these hurricanes (*e.g.,* vegetation changes from flooding, introduction of toxic chemicals, or water quality changes).

The Intergovernmental Panel on Climate Change (IPCC) concluded that warming of the climate system is unequivocal (IPCC 2014, p. 3). The more extreme impacts from recent climate change include heat waves, droughts, accelerated snow and ice melt including permafrost warming and thawing, floods, cyclones, wildfires, and widespread changes in precipitation amounts (IPCC 2014, pp. 4, 6). Due to projected climate-change associated sea level rise, coastal systems and low-lying areas will increasingly experience adverse impacts such as submergence, coastal flooding, and coastal erosion (IPCC 2014, p. 17). In response to ongoing climate change, many terrestrial, freshwater, and marine species have shifted their geographic ranges, seasonal activities, and migration patterns (IPCC 2014, p. 4). Species that are dependent on specialized habitat types or are limited in distribution will be most susceptible to future impacts of climate change. Many species will be unable to relocate rapidly enough to keep up with their climate niche under mid- and high-range rates of climate change. The climate velocity (the rate of movement of the climate across the landscape) will exceed the maximum velocity at which many groups of organisms, in many situations, can disperse or migrate, under certain climate scenarios. Populations of species that cannot migrate at effective speeds will find themselves in unfavorable climates, unable to reach areas of potentially suitable climate. Species with low dispersal capacity (such as plants, amphibians, and some small mammals) could be especially vulnerable (IPCC 2014, p. 275).

Biological and historical evidence suggests that the Louisiana black bear is well-adapted to endure the predicted effects of climate change throughout its range. As stated above, Louisiana black bears inhabit more than 1.4 million ac (approximately 576,000 ha) of habitat in all or portions of 21 Louisiana parishes and 6 Mississippi counties. It is a generalist that uses a variety of habitat types within and adjacent to the LMRAV, including forested wetlands, scrub-shrub, marsh, spoil banks, and upland forests (including upland hardwoods and mixed pine-hardwood forests). On a larger scale and to make a comparison to the Louisiana black bear's capability to use many habitat types, American black bears (in the other portions of the United States and Canada) are known to inhabit vast mountainous areas, coastal plains, chaparral and pinyon-juniper woodlands (*Pinus* spp., *Juniperus* spp.), oak-hickory forests (*Quercus* spp., *Carya* spp.), upland and bottomland hardwood forests, redwood-sitka spruce-hemlock woodlands (*Sequoia sempervirens—Picea sitchensis-Tsuga* spp.), and ponderosa pine forests (*Pinus ponderosa*), to name only a few (Pelton 2003, pp. 549–550). There is a vast array of habitats and associated food sources available for black bears throughout their current range, and bears have demonstrated adaptability and mobility in finding such areas. Therefore, it is highly unlikely that currently predicted climate change scenarios would impact black bear habitat to the extent that the Louisiana black bear would be unable to locate suitable habitats (in both quality and quantity) to maintain a viable population for the foreseeable future.

The Louisiana black bear is capable of efficiently traversing the landscape, and individual bears incorporate relatively large expanses of habitat within their respective home ranges (which varies based on gender and subpopulation). Home ranges vary from approximately 1,000 ac [400 ha] to 84,000 ac [34,000 ha] (Beausoleil 1999, p. 60; Wagner 1995, p. 12). Numerous long-distance movements of the Louisiana black bear have been confirmed, and there is documented evidence of dispersal throughout most of their current range (Figure 1, Davidson et al. 2015, p. 24). In the event habitat is lost due to climate change effects (such as extreme flooding or drought), Louisiana black bears have demonstrated the ability not only to move at a relatively rapid pace to more suitable areas, but also to adapt to a wide range of potential habitats and food sources.

Habitat supporting the LARB subpopulation (population range from 136 to 194 adult bears (Laufenberg and Clark 2014, p. 45)) of the Louisiana black bear is more vulnerable to the impacts of global climate change than other subpopulations due to its occurrence within low-elevation coastal habitats that are susceptible to flooding from extreme rainfall events, significant tidal surges (including those associated with tropical weather systems), and riverine flooding. That subpopulation occurs entirely within the Louisiana Coastal Zone which was delineated by the Louisiana Department of Natural Resources–Office of Coastal Management (LDNR–OCM) based on storm surge data, geology, elevation, soils, vegetation, predicted subsidence/sea level rise, and boundaries of existing coastal programs (LDNR–OCM 2010, pp. 54–60). Based on the current sea level rise estimates (*http://tidesandcurrents.noaa.gov/sltrends/sltrends.shtml*), we do not anticipate a complete and persistent inundation of the coastal zone of Louisiana within the next 100 years. Any such sea level rise impacts are likely to be ameliorated to some extent by the projected successional changes in the Atchafalaya Basin that would eventually convert many of its swamps to BLH forest, thus improving the suitability of that habitat for the Louisiana black bear (*e.g.,* facilitating its dispersal to higher elevation habitats if necessary for survival).

The Service estimated that more than 35,000 ac (14,000 ha) of lakes and cypress-tupelo swamps would convert to higher elevation forests within the ARB by the year 2030 (LeBlanc et al. 1981, p. 65). This prediction is supported by studies documenting increased sedimentation within the Basin (Hupp et al. 2008, p. 139). Sedimentation increases elevation, and areas that were once wet will be naturally colonized with vegetation that will ultimately result in upland forests (Hupp et al. 2008, p. 127) that are more suitable for bear foraging and habitation. Even if the most conservative models were exceeded and the entire coastal zone of Louisiana were subject to permanent inundation in the future (prior to projected habitat changes in the Atchafalaya Basin), only a relatively small proportion of Louisiana black bears and their habitat would be affected. Specifically, more than 80 percent of the Louisiana black bear HRPA, more than 90 percent of Louisiana black bear breeding habitat, 85 percent of Louisiana black bear critical habitat, and 70 percent of the Louisiana black bear population occur outside of the Louisiana Coastal Zone.

A specific illustration of the resilience of the Louisiana black bear to survive and adapt to extreme climatic events occurred during the recent operation of the Morganza Floodway. The UARB subpopulation occupies a 175-square-mile (453-square-km) area within and adjacent to the Morganza Floodway. Much of the area inhabited by the UARB subpopulation is subject to extreme flooding, especially when Mississippi River stages rise to levels that warrant the Corps' operation of the Morganza Floodway (which has only occurred twice, in 1973 and 2011). The 2011 operation of the Morganza Flood Control Structure coincidentally occurred during an ongoing 6-year

Louisiana black bear genetics and population dynamics study that included both radio telemetry and mark-recapture (via hair snares and genetics analyses) methods within and adjacent to the Morganza Floodway (O'Connell et al. 2014, pp. 479–482). Approximately 60 percent of the breeding habitat that supports the UARB subpopulation was covered in floodwaters ranging in depth from approximately 10 to 20 feet (3 to 6 meters; O'Connell et al. 2014, p. 477). Study results indicate that most bears (88.7 percent) maintained residence within the Morganza Floodway (presumably in the remaining 40 percent of available habitat that was less severely flooded) throughout the 56-day operational period of the Morganza Flood Control Structure (O'Connell et al. 2014, p. 482). A small number of bears did temporarily disperse to higher elevation forests, but most returned to their original home ranges following floodwater recession. The study concluded that the 2011 operation of the Morganza Flood Control Structure had ''no negative biological effects'' on adult Louisiana black bears within the UARB subpopulation (O'Connell et al. 2014, p. 483). Based on their adaptability, mobility, and demonstrated resiliency, and the lack of evidence suggesting that previous and ongoing climate change has had any adverse impact on the Louisiana black bear or its habitats, we conclude that climate change is not a threat to the Louisiana black bear now or within the foreseeable future.

Summary of Factor E: Based on recent genetic analyses, the effects of Minnesota bear reintroductions, while evident to some extent in the UARB subpopulation do not represent a threat to the Louisiana black bear. Other potential threats such as anthropogenic sources of mortality (*e.g.,* poaching, vehicle strikes, and nuisance bear management) and potential effects of hurricanes or climate change do not represent significant threats to the Louisiana black bear. In spite of ongoing mortality from those anthropogenic sources, recent research concludes that the Louisiana black bear within the Tensas and Upper Atchafalaya River Basins [specifically the metapopulation composed of the TRB, UARB, and TRC subpopulations] has an overall probability of persistence in the wild for the next 100 years in spite of any random demographic, genetic, environmental, or natural catastrophic effects, of approximately 100 percent (0.996; Laufenberg and Clark 2014, p. 2) and population numbers in the LARB subpopulation have nearly doubled since listing. The effects of climate change are not threats based on the species' adaptability, mobility, and demonstrated resiliency in regard to extreme climatic events. Based on all these factors, we find that there are no other natural or manmade factors that are threats to the Louisiana black bear.

Conclusion of the 5-Factor Analysis

Under section 3 of the Act, a species is endangered if it is ''in danger of extinction throughout all or a significant portion of its range'' and threatened if it is ''likely to become endangered in the foreseeable future throughout all or a significant portion of its range.'' We have carefully assessed the best scientific and commercial information available regarding the threats faced by the Louisiana black bear in developing this proposed rule. Research has documented that the four main Louisiana subpopulations (TRB, TRC, UARB, and LARB) are stable or increasing (Hooker 2010, O'Connell 2013, Troxler 2013, Laufenberg and Clark 2014, entire documents respectively). Emigration and immigration (*i.e.,* gene flow) has been documented among several of the Louisiana and Mississippi subpopulations (Laufenberg and Clark 2014, pp. 91–94). Overall, the Louisiana black bear metapopulation (TRB, UARB, and TRC) has an estimated probability of long-term persistence (more than 100 years) of 0.996 under even the most conservative scenario (Laufenberg and Clark 2014, p. 82). The areas supporting Louisiana black bear breeding subpopulations have also increased over 430 percent, for a total of 1,806,556 ac (731,087 ha) (Table 1). Based on the analysis in this rule and given the reduction in some threats and evidence that other factors are not threats, we conclude that the Louisiana black bear is not in danger of extinction throughout all of its range or likely to become endangered within the foreseeable future throughout all of its range. With the detailed monitoring and management actions described in our PDM plan (see Post-Delisting Monitoring section) and the referenced Louisiana Black Bear Management Plan, we believe that if this rule is finalized, the Louisiana black bear metapopulation will continue to remain viable for at least the next century (Laufenberg and Clark 2014, entire document). As the PDM plan is implemented, we will monitor subpopulations and threat levels to ensure that no triggers are reached that would require instituting ESA protection for this bear. In addition, if this rule is finalized and the bear is ultimately delisted, the Service, other partners and States will continue past delisting to implement programs and conservation actions (*e.g.,* habitat restoration, protection and management) that will directly and indirectly contribute to the conservation of the Louisiana black bear across its range.

Significant Portion of the Range Analysis

Under the Act and our implementing regulations, a species may warrant listing if it is in danger of extinction or likely to become so throughout all or a significant portion of its range. Having determined that the Louisiana black bear is not endangered or threatened throughout all of its range, we next consider whether there are any significant portions of its range in which the Louisiana black bear is in danger of extinction or likely to become so. We published a final policy interpreting the phrase ''Significant Portion of its Range'' (SPR) (79 FR 37578; July 1, 2014). The final policy states that (1) if a species is found to be endangered or threatened throughout a significant portion of its range, the entire species is listed as endangered or threatened, respectively, and the Act's protections apply to all individuals of the species wherever found; (2) a portion of the range of a species is ''significant'' if the species is not currently endangered or threatened throughout all of its range, but the portion's contribution to the viability of the species is so important that, without the members in that portion, the species would be in danger of extinction, or likely to become so in the foreseeable future, throughout all of its range; (3) the range of a species is considered to be the general geographical area within which that species can be found at the time the Service makes any particular status determination; and (4) if a vertebrate species is endangered or threatened throughout a significant portion of its range, and the population in that significant portion is a valid Distinct Population Segment (DPS), we will list the DPS rather than the entire taxonomic species or subspecies.

The procedure for analyzing whether any portion is a SPR is similar, regardless of the type of status determination we are making. The first step in our analysis of the status of a species is to determine its status throughout all of its range. If we determine that the species is in danger of extinction, or likely to become endangered in the foreseeable future, throughout all of its range, we list the species as an endangered species or threatened species and no SPR analysis will be required. If the species is neither

in danger of extinction nor likely to become so throughout all of its range, as we have found here, we next determine whether the species is in danger of extinction or likely to become so throughout a significant portion of its range. If it is, we will continue to list the species as an endangered species or threatened species, respectively; if it is not, we conclude that listing the species is no longer warranted.

When we conduct an SPR analysis, we first identify any portions of the species' range that warrant further consideration. The range of a species can theoretically be divided into portions in an infinite number of ways. However, there is no purpose in analyzing portions of the range that have no reasonable potential to be significant or in analyzing portions of the range in which there is no reasonable potential for the species to be endangered or threatened. To identify only those portions that warrant further consideration, we determine whether substantial information indicates that: (1) The portions may be ''significant'' and (2) the species may be in danger of extinction there or likely to become so within the foreseeable future. Depending on the biology of the species, its range, and the threats it faces, it might be more efficient for us to address the significance question first or the status question first. Thus, if we determine that a portion of the range is not ''significant,'' we do not need to determine whether the species is endangered or threatened there; if we determine that the species is not endangered or threatened in a portion of its range, we do not need to determine if that portion is ''significant.'' In practice, a key part of the determination that a species is in danger of extinction in a significant portion of its range is whether the threats are geographically concentrated in some way. If the threats to the species are affecting it uniformly throughout its range, no portion is likely to have a greater risk of extinction, and thus would not warrant further consideration. Moreover, if any concentration of threats apply only to portions of the range that clearly do not meet the biologically based definition of ''significant'' (*i.e.,* the loss of that portion clearly would not be expected to increase the vulnerability to extinction of the entire species), those portions would not warrant further consideration.

Applying the process described above, we have already determined that the species is no longer endangered or threatened throughout its range. We next evaluated the range of this subspecies to determine if any areas could be considered a significant portion of its range. One way to identify portions for further analyses is to identify any natural divisions within the range that might be of biological or conservation importance. While there is some minor variability in the habitats occupied by the Louisiana black bear across its range, the basic ecological components required for the species to complete its life cycle (*e.g.,* BLH or upland forest habitat having a high species and age class diversity that provides for hard and soft mast supplies, denning sites, and escape cover) are present throughout the habitats occupied by this species. No specific location within the current range of the species provides a unique or biologically significant function that is not found in other portions of the range.

We next examined whether any threats are geographically concentrated in some way that would indicate the Louisiana black bear would be in danger of extinction, or likely to become so in that area. In Louisiana, both the Louisiana and Mississippi black bear breeding populations occur in the LMRAV. These subpopulations make up the majority of the overall Louisiana black bear bear population and all face the same type of potential threats—primarily habitat conversion. We have already discussed that trends in that threat have been significantly reduced and in some cases reversed (see Factors A and D). Estimates of long-term viability of the TRB and the UARB subpopulations were greater than 95 percent except for the two most conservative models for the UARB (long-term viability estimates of 85 percent and 92 percent).

Through our review of potential threats we identified the LARB subpopulation as one that that may be at greater risk of extinction due to its additional threats from future anticipated development and sea level rise. We thus considered whether this subpopulation may warrant further consideration as a significant portion of the Louisiana black bear range. The LARB is located within the coastal area of Louisiana in St. Mary, Iberia, and Vermillion Parishes in forested habitat similar to other Louisiana black bear subpopulations. That subpopulation is separated from the other subpopulations and the habitat between them within the Basin is believed to be too wet currently to support breeding females, although bears have been observed along the higher areas on both sides of the Basin. The probability of interchange between the LARB and the other subpopulations is low (Laufenberg and Clark 2014, p. 93); however, reports of bear live-captures, known natal dens, and confirmed sightings indicate bears can and do move out (at least temporarily) of this subpopulation (Figure 1, Davidson et al. 2015, p. 24). Dispersal by male bears of more than 100 miles by males is not unusual and combined with the documented occurrences of bears (likely males) on the higher portions (levees and ridges) of the Atchafalaya Basin spanning the area between the UARB and LARB subpopulations, movement of individuals among other subpopulations cannot be ruled out. Increased sedimentation is occurring in the interconnecting habitat in the Atchafalaya Basin (Hupp et al. 2008, p. 139) as predicted by LeBlanc et al. (1981, p. 65). The increase in sedimentation is resulting in higher elevations within the Basin that will produce suitable bear habitat (*e.g.,* less wet and more food sources).

Additionally, range expansion by bears from the northern subpopulations would take advantage of the improved Atchafalaya Basin habitats. At the current time, the LARB subpopulation is stable to increasing, although we did not have data to determine its long-term viability. The LARB has been characterized by some, based on its genetic uniqueness, as more representative of the Louisiana black bear and thus should be given special consideration for its integrity (Triant et al. 2003, p. 647). However, Csiki et al. (2003, p. 699) suggested that the distinctness of the Louisiana black bear was the result of a genetic bottleneck rather than a true genetic difference. Since 2003, our understanding of genetic markers has improved. Studies by Troxler (2013) and Laufenberg and Clark (2014) reached similar conclusions (*e.g.,* that distinctness is likely due to isolation resulting in restricted gene flow and genetic drift) as Csiki et al. (2003) concluded.

Habitat supporting the LARB subpopulation (population range from 136 to 194 adult bears (Laufenberg and Clark 2014, p. 45)) of the Louisiana black bear is more vulnerable to one of the particular effects of global climate change, the long term threat of sea level rise, than other subpopulations due to its occurrence within low-elevation coastal habitats. However, as discussed above, in the event of coastal bear habitat loss due to climate change effects, bears have demonstrated the ability to adapt and move to more suitable areas and would likely move into suitable areas. Additionally, any long-term threat of sea level rise would likely be ameliorated to some extent by

the projected successional changes in the Atchafalaya Basin that would eventually convert many of its swamps to BLH forest, thus improving the suitability of that habitat for the Louisiana black bear. It is unlikely that such changes would cause the loss of this subpopulation or appreciably reduce the long-term viability of the Louisiana black bear.

We also evaluated whether the other occurrences that we cannot currently consider self-sustaining in Mississippi and northern Louisiana could be considered a significant portion of the species' range. However, those subpopulations have formed as the result of emigration from nearby subpopulations. Therefore, based on examination of information on the biology and life history of the Louisiana black bear, we determined that there are no separate areas of the range that are significantly different from others or that are likely to be of greater biological or conservation importance than any other areas.

In conclusion, we have determined that none of the existing or potential threats, either alone or in combination with others, are likely to cause the Louisiana black bear to be in danger of extinction throughout all or a significant portion of its range, nor is it likely to become endangered within the foreseeable future throughout all or a significant portion of its range. On the basis of this evaluation, we conclude the Louisiana black bear no longer requires the protection of the Act, and propose to remove the Louisiana black bear from the Federal List of Endangered and Threatened Wildlife (50 CFR 17.11(h)).

Effects of This Proposed Rule

This rule, if finalized, would revise 50 CFR 17.11(h) to remove Louisiana black bear from the List of Endangered and Threatened Wildlife. In addition, the rule would revise § 17.11(h) to remove similarity of appearance protections for the American black bear, which are in effect within the historical range of the Louisiana black bear. This designation is assigned for law enforcement purposes to an unlisted species that so closely resembles the listed species that its taking represented an additional threat to the Louisiana black bear at the time of listing. With the delisting of the Louisiana black bear, such a designation would no longer be necessary.

If this proposed rule is finalized, the prohibitions and conservation measures provided by the Act would no longer apply to the Louisiana black bear. Federal agencies would no longer be required to consult with us under section 7 of the Act to ensure that any action authorized, funded, or carried out by them is not likely to jeopardize the bear's continued existence. The prohibitions under section 9(a)(1) of the Act would no longer make it illegal for any person subject to the jurisdiction of the United States to import or export, transport in interstate or foreign commerce, or take, possess, sell, deliver, carry, transport, or ship Louisiana black bears. Finally, this rule would also remove the Federal regulations related to the Louisiana black bear listing: The special rule provisions at 50 CFR 17.40(i) and the critical habitat designation at 50 CFR 17.95(a).

Post-Delisting Monitoring

Section 4(g)(1) of the Act requires us to implement a system in cooperation with the States to monitor effectively, for not less than 5 years the status of all species that have recovered and been removed from the Federal List of Endangered and Threatened Wildlife and Plants (List). Section 4(g)(2) of the Act directs us to make prompt use of its emergency listing authorities under section (4)(b)(7) to prevent significant risk to the well-being of any recovered species. PDM refers to activities undertaken to verify that a species delisted due to recovery remains secure from the risk of extinction after the protections of the Act no longer apply. The primary goal of PDM is to ensure that the species' status does not deteriorate, and if a decline is detected, to take measures to halt the decline so that proposing it as threatened or endangered is not again needed. If at any time during the monitoring period, data indicate that protective status under the Act should be reinstated, we can initiate listing procedures, including, if appropriate, emergency listing. At the conclusion of the monitoring period, we will review all available information to determine if relisting, the continuation of monitoring, or the termination of monitoring is appropriate.

Section 4(g) of the Act explicitly requires that we cooperate with the States in development and implementation of PDM programs. However, we remain ultimately responsible for compliance with section 4(g) and, therefore, must remain actively engaged in all phases of PDM. We also seek active participation of other entities that are expected to assume responsibilities for the species' conservation after delisting. In August 2013, LDWF and the Service agreed to be cooperators in the PDM of the Louisiana black bear.

We have prepared a Draft PDM Plan for the Louisiana black bear (*Ursus americanus luteolus*) (Service 2015). This plan is designed to detect significant declines in Louisiana black bear populations with reasonable certainty and precision. The draft Plan:

(1) Summarizes the species' status at the time of delisting;

(2) Defines thresholds or triggers for potential monitoring outcomes and conclusions;

(3) Lays out frequency and duration of monitoring;

(4) Articulates monitoring methods including sampling considerations;

(5) Outlines data compilation and reporting procedures and responsibilities; and

(6) Proposes a PDM implementation schedule including timing and responsible parties.

Concurrent with this proposed delisting rule, we announce the draft plan's availability for public review. The draft PDM plan can be viewed in its entirety at: *http://www.fws.gov/lafayette/* or at *http://www.regulations.gov* under Docket Number FWS–R4–ES–2015–0014. Copies can also be obtained from the U.S. Fish and Wildlife Service, Louisiana Ecological Services Field Office, Lafayette, Louisiana (see **FOR FURTHER INFORMATION CONTACT** section). We seek information, data, and comments from the public regarding the Louisiana black bear and the PDM strategy. We are also seeking peer review of this draft plan concurrently with this comment period. We anticipate finalizing this plan, considering all public and peer review comments, prior to making a final determination on the proposed delisting rule.

Peer Review

In accordance with our policy published in the **Federal Register** on July 1, 1994 (59 FR 34270), and the OMB's Final Information Quality Bulletin for Peer Review, dated December 16, 2004, we will solicit the expert opinions of at least three appropriate and independent specialists regarding the science in this proposed rule and the draft PDM plan. The purpose of such review is to ensure that we base our decisions on scientifically sound data, assumptions, and analyses. We will send peer reviewers copies of this proposed rule and the draft PDM plan immediately following publication of this proposed rule in the **Federal Register**. We will invite peer reviewers to comment, during the public comment period, on the specific assumptions and conclusions regarding the proposed delisting rule and draft PDM plan. We will summarize the opinions of these

reviewers in the final decision documents, and we will consider their input and any additional information we receive as part of our process of making a final decision on this proposal and the draft PDM plan. Such communication may lead to a final decision that differs from this proposal.

Clarity of This Proposed Rule

We are required by Executive Orders 12866 and 12988 and by the Presidential Memorandum of June 1, 1998, to write all rules in plain language. This means that each rule we publish must:

(a) Be logically organized;

(b) Use the active voice to address readers directly;

(c) Use clear language rather than jargon;

(d) Be divided into short sections and sentences; and

(e) Use lists and tables wherever possible.

If you feel that we have not met these requirements, send us comments by one of the methods listed in **ADDRESSES**. To better help us revise the rule, your comments should be as specific as possible. For example, you should tell us the numbers of the sections or paragraphs that are unclearly written, which sections or sentences are too long, the sections where you feel lists or tables would be useful, etc.

Required Determinations

Paperwork Reduction Act of 1995

This proposed rule does not contain collections of information that require approval by the Office of Management and Budget under the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 *et seq.*). This proposed rule will not impose recordkeeping or reporting requirements on state or local governments, individuals, businesses, or organizations. We may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number.

National Environmental Policy Act

We have determined that we do not need to prepare an Environmental Assessment or Environmental Impact Statement, as defined in the National Environmental Policy Act of 1969 (42 U.S.C. 4321 *et seq.*), in connection with regulations adopted pursuant to section 4(a) of the Endangered Species Act. We published a notice outlining our reasons for this determination in the **Federal Register** on October 25, 1983 (48 FR 49244).

Government-to-Government Relationship With Tribes

In accordance with the President's memorandum of April 29, 1994, ''Government-to-Government Relations with Native American Tribal Governments'' (59 FR 22951), Executive Order 13175, and the Department of the Interior's manual at 512 DM 2, we readily acknowledge our responsibility to communicate meaningfully with recognized Federal Tribes on a government-to-government basis. We have determined that no tribal lands or interests are affected by this proposal.

References Cited

A complete list of references cited is available on *http://www.regulations.gov* under Docket Number FWS–R4–ES–2015–0014.

Author

The primary author of this document is Deborah Fuller, Louisiana Field Office (see **FOR FURTHER INFORMATION CONTACT** section).

List of Subjects in 50 CFR Part 17

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

Proposed Regulation Promulgation

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

PART 17—[AMENDED]

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

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

§ 17.11 [Amended]

■ 2. Amend § 17.11(h) by removing the entries for ''Bear, American black'' and ''Bear, Louisiana black'' under ''MAMMALS'' from the List of Endangered and Threatened Wildlife.

§ 17.40 [Amended]

■ 3. Amend § 17.40 by removing and reserving paragraph (i).

§ 17.95 [Amended]

■ 4. Amend § 17.95(a) by removing the entry for ''Louisiana Black Bear (*Ursus americanus luteolus*)''.

Dated: May 5, 2015.

Stephen Guertin,

Acting Director, U.S. Fish and Wildlife Service.

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