

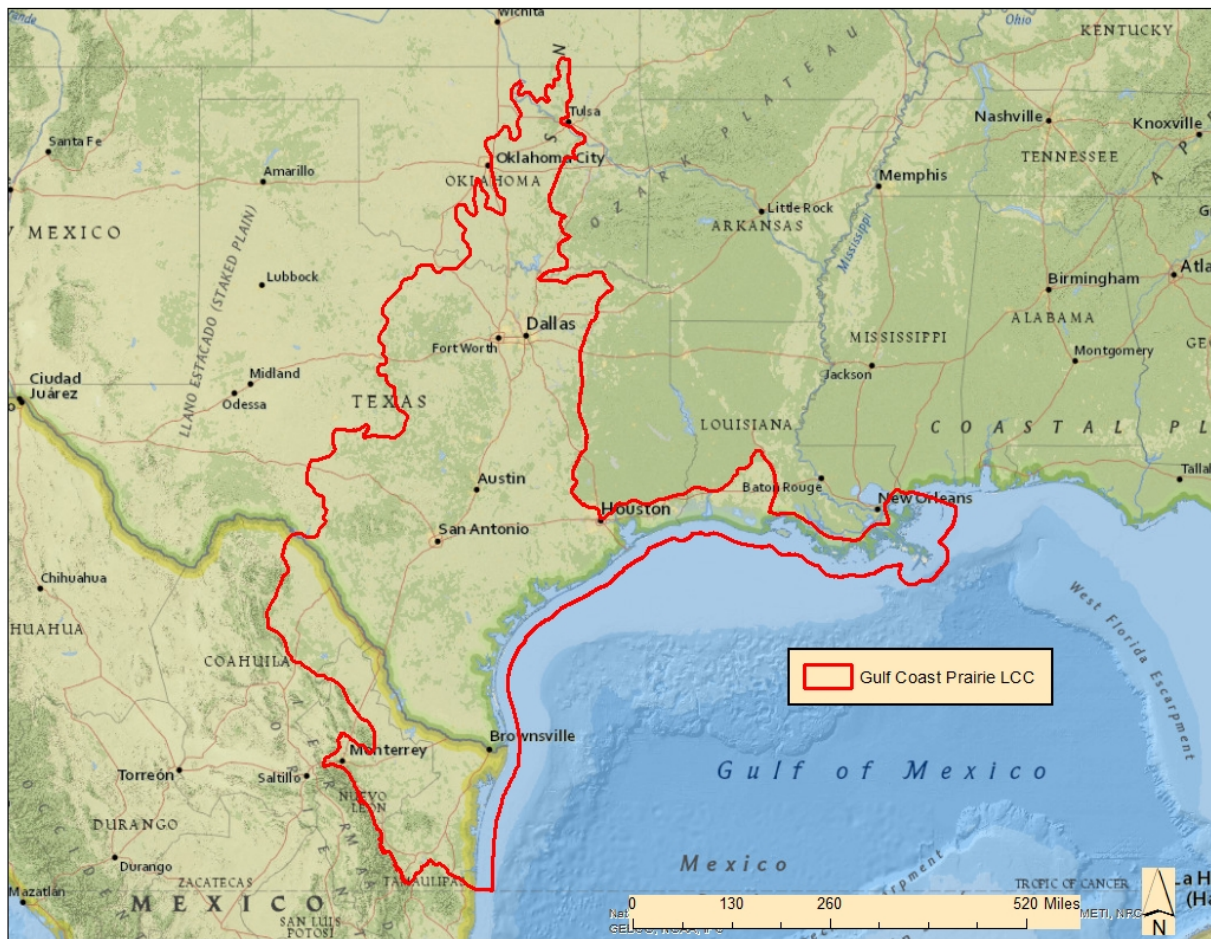
Setting Northern Bobwhite Objectives for the Gulf Coast Prairie Landscape Conservation Cooperative: A Tri-Joint Venture Initiative

In 2010, to address impacts of climate change on United States natural and cultural resources, the Department of the Interior proposed the establishment of Landscape Conservation Cooperatives (LCCs) (Salazar 2010). LCCs are partnerships of federal, state, tribal, and local governments and private landowner partners organized to develop landscape-level strategies for understanding and responding to climate change impacts, operating under the Strategic Habitat Conservation (SHC) framework (National Ecological Assessment Team 2008). To a significant extent, LCCs were patterned according to the existing North American bird habitat Joint Ventures, which rely on a partnership approach to set population and habitat objectives, and design, implement, and assess habitat projects for priority bird species. LCC boundaries are organized around landscape geography and ecology versus political or organizational jurisdictions. The Gulf Coast Prairie (GCP) LCC (Figure 1) extends from northeastern Mexico through eastern Texas and central Oklahoma and into a small portion of south-central Kansas, and east into coastal Louisiana and the extreme southwestern portion of coastal Mississippi. This landscape encompasses the majority of four Bird Conservation Regions (BCRs); BCR 20, Edwards Plateau; BCR 21, Oaks and Prairies; BCR 36, Tamaulipan Brushlands, and BCR 37, Gulf Coastal Prairie (Figure 2). The GCP LCC also encompasses the majority of three bird habitat Joint Ventures; the Oaks and Prairies Joint Venture (OPJV), the Rio Grande Joint Venture (RGJV), and the Gulf Coast Joint Venture (GCJV) (Figure 3). When the GCP LCC was formed in 2010, these three Joint Venture partnerships had already progressed, to varying degrees, in identifying priority bird species, establishing population and habitat objectives, and planning and implementing habitat projects. To avoid redundancy and possible confusion with shared partners over conflicting bird objectives, the three Joint Ventures offered to assist as the bird planning group for the GCP LCC. This offer was welcomed by the GCP LCC partnership. The GCP LCC developed a list of priority species linked to important habitats in the LCC geography. Several species of birds were selected; the majority had been previously selected by one or more of the three JVs as conservation priorities.

In July 2015, representatives of the OPJV, RGJV, GCJV and the GCP LCC met to discuss the state of bird conservation planning within the GCP LCC geography, and to explore opportunities for collaborative bird conservation planning across the entire GCP LCC geography. All three of the JVs and the LCC identified Northern Bobwhite (*Colinus virginianus*) as a priority for conservation, and the GCJV and OPJV had established population and habitat objectives. However, both JVs had approached this fundamental portion of the SHC framework differently. The group decided to explore whether or not the process for setting Northern Bobwhite population and habitat objectives could be harmonized across the LCC geography by adopting a shared methodology across JVs.

At a subsequent meeting in November 2015, representatives from the three JVs, the GCP LCC, Texas Parks and Wildlife Department (TPWD) and the Oklahoma Department of Wildlife Conservation described their Northern Bobwhite objective setting and habitat implementation processes. The GCJV and the Gulf Coast Bird Observatory used the 2001 Northern Bobwhite Conservation Initiative's (NBCI) methodology to set objectives for BCR 37. This methodology aimed to restore Northern Bobwhite

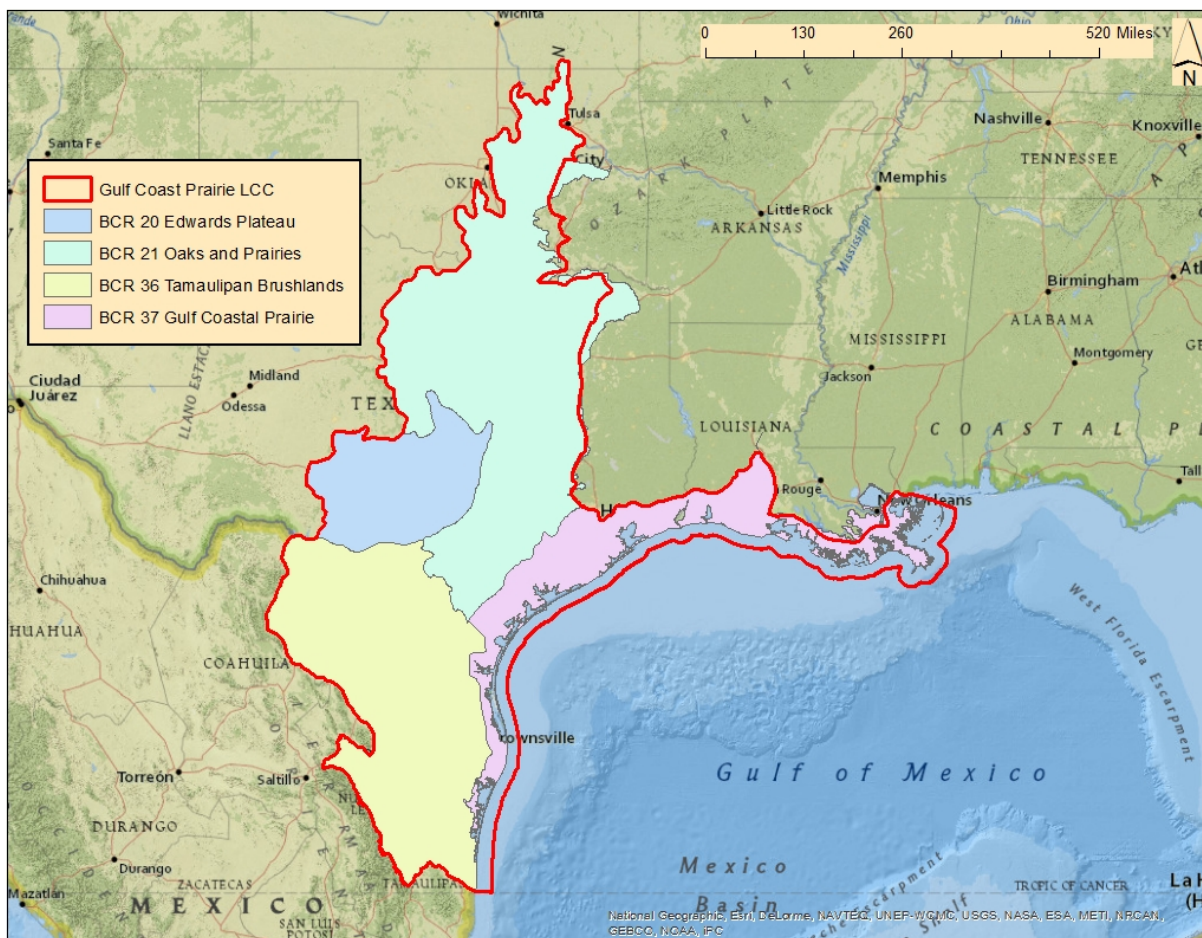
Figure 1: Gulf Coast Prairie Landscape Conservation Cooperative



populations to fall 1980 densities and contained assumptions about carrying capacity of various types of agricultural and forested lands. Theoretically, objectives could be met by improving habitat conditions on many combinations of habitat types. When the GCJV established Northern Bobwhite population and habitat objectives for the portion of the JV region within BCRs 25 (West Gulf Coastal Plain), 26 (Mississippi Alluvial Valley), and 27 (Southeastern Coastal Plain) the NBCI had been revised and a different objective setting methodology was established. The 2011 NBCI revision used a Biologist's Ranking Index to rank existing habitat value in states in the bird's range (i.e., None, Low, Medium, or High) according to existing Northern Bobwhite populations, existing habitat types, and the potential to increase those populations through management. Empirical data from surveys and expert opinion was used to set an estimated density and a potential managed density by habitat type and quality. However, there are still questions regarding the accuracy of these expert opinion-based density estimates and objectives (William Vermillion, personal observation, Northern Bobwhite Technical Committee Meeting, 2016), and their utility for assessing progress towards national Northern Bobwhite objectives.

The NBCI uses fall counts to generate Northern Bobwhite population estimates and objectives. The OPJV is engaged in conservation planning for many grassland bird species for which population estimates and

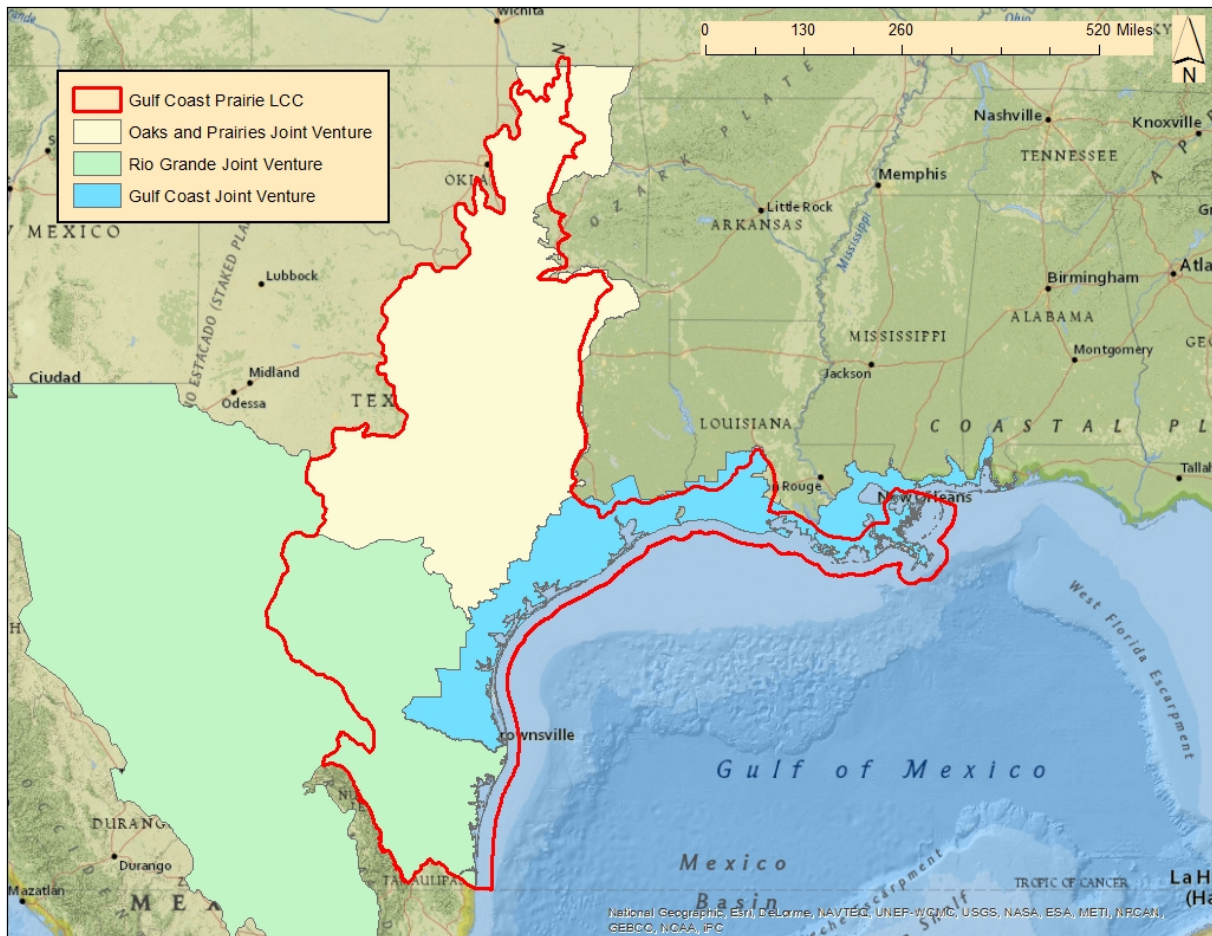
Figure 2: Bird Conservation Regions in the Gulf Coast Prairie Landscape Conservation Cooperative



objectives are based on the Breeding Bird Survey (BBS), which is conducted during the spring-early summer. The OPJV elected to use spring counts to set population and habitat estimates and objectives and to monitor priority grassland bird species, versus using a separate methodology for a single species, Northern Bobwhite.

Partners in Flight (PIF) uses a global population estimate of 5,800,000 for Northern Bobwhite, provided by the NBCI (PIF Science Committee 2013, Rosenberg et al. 2016). The PIF Population Estimates Database (PIF Science Committee 2013) gives the estimated percent of the global population by BCR and BCR/State subdivision. The OPJV derived an estimate of existing Northern Bobwhite abundance within their JV with this information, and used the 10-year BBS trends for the Oaks and Prairies BCR and Edwards Plateau BCR to calculate the number of birds that would be lost over a 10-year period. The OPJV's Northern Bobwhite population objective is to ensure that these losses do not occur (Figure 4), by providing the estimated amount of improved habitat needed to offset population declines, while maintaining existing suitable habitat. Stated differently, their population objective is to achieve a stable (0%/year) population trend after 10 years of habitat implementation. Using an average cost per acre for habitat improvement, the OPJV calculated the estimated cost to meet habitat needs to achieve

Figure 3: Bird Habitat Joint Ventures in the Gulf Coast Prairie Landscape Conservation Cooperative



population objectives. The RGJV drafted population and habitat objectives for Northern Bobwhite using the OPJV methodology. At the conclusion of the November 2015 meeting, the GCJV agreed to explore the use of the same methodology to set Northern Bobwhite objectives in hopes of defining a common methodology across the GCP LCC.

Some important assumptions are contained in this methodology:

- In the absence of management, BBS population trends used to calculate population objectives will continue (i.e. populations will continue to decline at the current rate) over the targeted management period
- Management actions will be sufficient to offset predicted population losses and stabilize decreasing population trends by the end of the targeted management period
- Sufficient habitat will be available over the targeted management period to achieve habitat objectives
- Farm Bill and other landowner incentive programs will be available over the targeted management period to contribute to attainment of habitat objectives

Initially the OPJV used an estimate of 16.5 acres of appropriate habitat per pair of Northern Bobwhite to generate habitat objectives. Subsequent to the November 2015 meeting, there was a literature search of Northern Bobwhite spring home ranges to discern whether that value was appropriate across the GCP LCC geography. A wide range of values was recorded (Table 1). After removing the five largest values and averaging the remaining ones, a value of 30.64 acres spring home range per pair (or 15.32 acres pre bird) was derived and agreed upon by the JV and TPWD representatives.

The JVs chose to use the 20-year BBS trend for Northern Bobwhite to set habitat objectives in their geographies, assuming that objectives can be achieved over a 10-year period. This BBS trend period was selected in an attempt to account for natural boom-bust cycling of Northern Bobwhite populations in the RGJV geography (DeMaso et al. 2011). Table 2 depicts Northern Bobwhite population and habitat objectives using 20-year BBS trends and assuming objectives will be achieved over a future 10-year period.

Figure 4: Conceptual Diagram for Setting Northern Bobwhite Population and Habitat Objectives

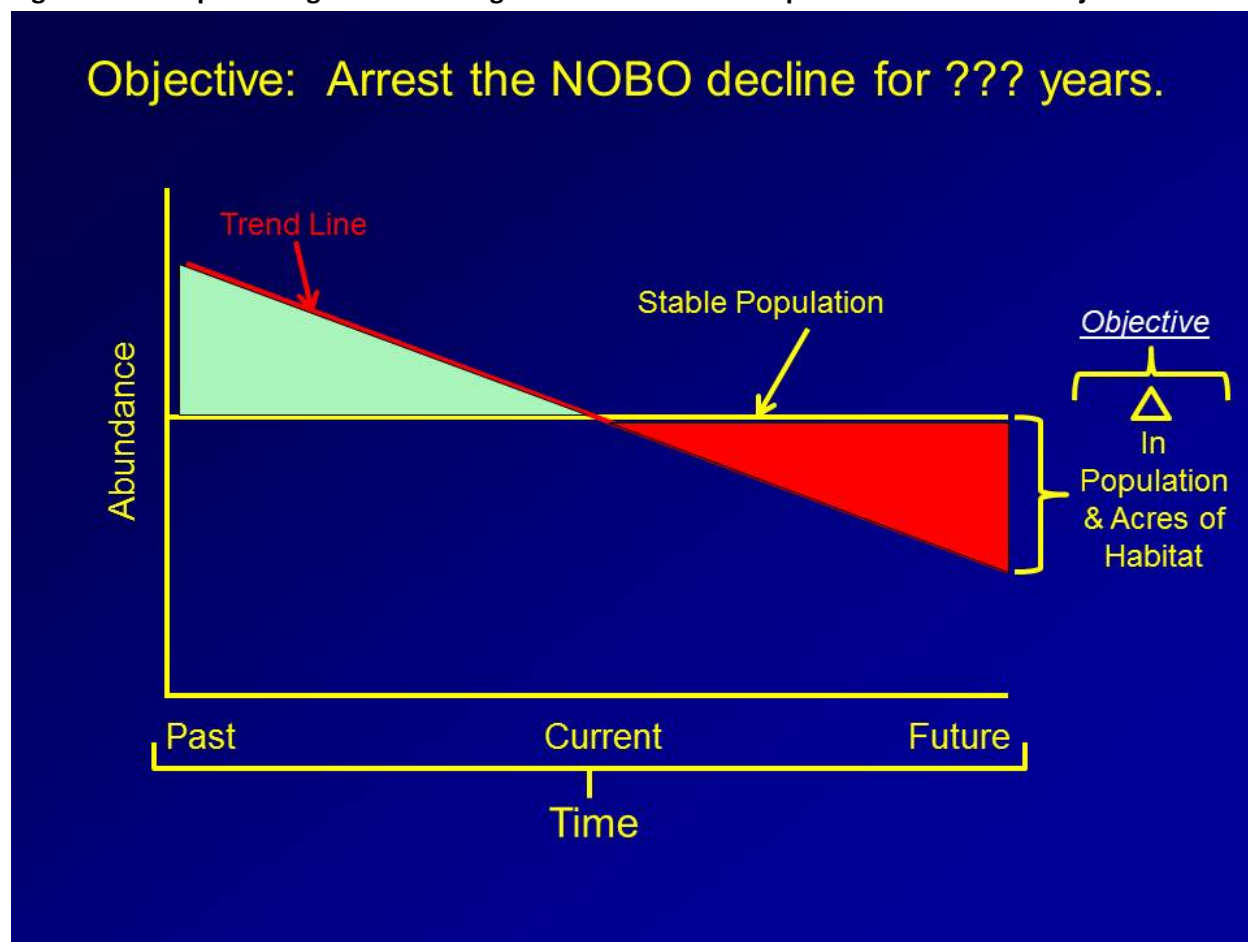


Table 1: Northern Bobwhite Spring Home Range Estimates, Gulf Coast Prairie LCC Geography

State	Season	Habitat Type	Method	Sex	Sample Size	Home Range Estimate (ha)	Home Range Estimate (acre)	Citation
MS	Spring	Forest	Telemetry	Male	72	9.9	24.5	Lee (1994)
	Spring	Forest	Telemetry	Male	1	282.0	696.8	Lee (1994)
MS	Spring	Fallow-field, Early-successional	Telemetry	Both	44	11.2	27.7	Manley (1994)
	Spring	Fallow-field, Early-successional	Telemetry	Both	44	44.1	109.0	Manley (1994)
LA	Spring	Mixed Pine -Hardwood	Telemetry	Both	16	18.4	45.5	Bell et al. (1985)
	Spring	Mixed Pine -Hardwood	Telemetry	Both	16	58.4	144.3	Bell et al. (1985)
TX	Late-Winter	Southwest Texas	Observation	Both	1	5.7	14.0	Lehmann (1984:32)
TX	Late-Winter	Pastures and Upland Farms	Observation	Both	588	6.8	16.8	Lehmann (1984:142, Table 22.1)
		Upland Farms	Observation	Both	100	11.0	27.2	
		Cultivated and Fallow Land	Observation	Both	85	35.4	87.5	
		Cultivated and Fallow Land	Observation	Both	7	98.3	242.9	
		Post Oak Dominate	Observation	Both	12	64.1	158.3	
		Cutover	Observation	Both	27	7.5	18.5	
		Small Upland Farms	Observation	Both	121	3.2	7.9	
		Drainage Fair to Poor	Observation	Both	51	10.4	25.7	
		Fairly Well Drained	Observation	Both	40	6.5	16.0	
		Poorly Drained	Observation	Both	31	15.7	38.7	
		Well-drained Mixed Soil	Observation	Both	90	8.6	21.2	
		Sandy Farms	Observation	Both	20	23.3	57.5	
		Sublime Prairie	Observation	Both	112	18.8	46.4	
		Live Oak Dominant	Observation	Both	47	8.3	20.4	
		Huisache-Grassland - Managed	Observation	Both	156	1.9	4.8	
		Huisache-Grassland - Unmanaged	Observation	Both	26	20.7	51.2	

Table 2: Gulf Coast Prairie LCC and Associated Joint Venture Northern Bobwhite Population and Habitat Objectives, Based on 1995-2015 Breeding Bird Survey Trends and a 10 Year Habitat Delivery Timeline

BCR	State	JV	Northern Bobwhite Population Estimate and Objective	Total Northern Bobwhite Habitat Objective, Assuming 15.32 ac per Bird	BBS Trend, 1995-2015	10 Year Population Loss Assuming 1995-2015 BBS Trend	10 Year Habitat Delivery Objective to Offset 10 Year Loss, Assuming 15.32 ac per Bird
20	TX	OPJV	80,766	1,237,335	-3.26	22,785	349,066
21	OK	OPJV	110,796	1,697,395	-4.48	40,736	624,076
21	TX	OPJV	249,197	3,817,698	-4.48	91,623	1,403,664
25*	LA	GCJV	1,072	16,423	-6.06	498	7,629
25*	TX	GCJV	430	6,588	-6.06	200	3,064
26*	LA	GCJV	4,036	61,832	-5.12	1,650	25,278
27*	AL	GCJV	2,288	35,052	-5.37	971	14,876
27*	LA	GCJV	531	8,135	-5.37	225	3,447
27*	MS	GCJV	2,905	44,505	-5.37	1,232	18,874
36	TX	RGJV	252,114	3,862,386	2.78	0	Maintain
37	LA	GCJV	12,673	194,150	-2.40	2,733	41,870
37	MS	GCJV	46	705	-2.40	10	153
37	TX	GCJV	103,178	1,580,687	-2.40	22,253	340,916
Total			820,032	12,562,890		184,916	2,832,913
*JV-BCR segments which are not within the GCP LCC geography							

While the population estimates and objectives generated by this methodology are based on spring abundance, the GCP LCC partnership representatives believe they are potentially transferable to the

current NBCI fall abundance-based population estimates and objectives, by using the percent summer gain as described by Sands (2010). Sands (2010) estimated a 131.93% summer gain for southern U.S. latitudes. Using this value and the total population objective from Table 3 (820,032 birds) in the formula below yields:

Fall population objective = Spring population objective + (Spring population objective X Percent summer gain)

Fall population objective = 820,032 birds + (820,032 birds X 131.93%)

Fall population objective = 1,901,900 birds.

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