Appendix A. Recommended Conservation Actions for Sprague's Pipit, Chestnut-collared Longspur, McCown's Longspur, and Baird's Sparrow.

The Objectives, Sub-objectives, and Action Items in this appendix represent the needs of highest importance in order to identify limiting factors and to reduce and reverse the declines of the Species. Objectives and Sub-objectives are not prioritized. Actions for each species are assigned a priority ranking to highlight the relative importance of each action; however, all research, inventory and monitoring, conservation planning, implementation, and outreach actions in this appendix are important and critical to the conservation of the Species. Background information and justification for these recommended conservation actions can be found in the text of the strategy.

SPPI: Sprague's Pipit; CCLO: Chestnut-collared Longspur; MCLO: McCown's Longspur, BAIS: Baird's Sparrow.

Objective	*Sub-objective*	*Action*	*Description*	*Annual Cycle*	*Ranking Priority* SPPI	CCLO	MCLO	BAIS
1			**Develop population and habitats targets**					
1	1.1		Evaluate current population status, trends, and distribution.					
1	1.1	1.1.1	Assess survey data to identify how population trends vary in time and space.					
			a. Assess how ranges have contracted and shifted over time.	Breeding	High	High	High	High
			b. Assess population changes at various spatial scales, i.e., BCR, state/province, ecoregion.		High	High	High	High
1	1.1	1.1.2	Develop/maintain species-habitat distribution models.					
			a. Inventory, update, and coordinate range-wide modeling efforts.	All	Moderate	Moderate	Moderate	Moderate
			1) Update Sather (2015) range occurrence models to include breeding ranges in Colorado and Wyoming.	Breeding	Low	High	High	Low
			2) Update Niemuth et al. (2017) models for breeding range occurrence models.	Breeding	Low	High	High	High
			3) Develop eBird STEM models.	Migration, Winter	Moderate	Low	Moderate	Moderate
			b. Compile existing point count data into centralized system to facilitate model updates.	All	Moderate	Moderate	Moderate	Moderate
			c. Make the information available to diverse partners.	All	Moderate	Moderate	Moderate	Moderate
1	1.1	1.1.3	Update global, national, and regional population estimates.					
			a. Evaluate population estimates from different data sources and explicitly acknowledge and estimate error.	Breeding	High	High	High	High
1	1.1	1.1.4	Review and refine breeding population trend objectives based on 2016 PIF NALCP recommendations.	Breeding	High	High	High	High

Objective	*Sub-objective*	*Action*	*Description*	*Annual Cycle*	*Ranking Priority* SPPI	CCLO	MCLO	BAIS
1	1.1	1.1.5	Develop population and habitat objectives at multiple scales, e.g., JVs, states, BCRs, by stepping down PIF population trend objectives.	Breeding, Winter	High	High	High	High
1	1.2		Optimize inventory and monitoring activities to inform status, trend, population estimates, and management actions.	All				
1	1.2	1.2.1	Conduct power analysis to assess the ability of BBS and IMBCR to detect population changes at desired time intervals and population thresholds.	Breeding	Moderate	Moderate	Moderate	Moderate
1	1.2	1.2.2	Increase the use and efficiency (i.e., statistical power) of the BBS to detect changes in populations.					
			a. Increase annual completion rates of current BBS routes by recruiting and training additional observers.	Breeding	High	High	High	High
			b. Assess the need for new BBS routes in areas with insufficient coverage.		Moderate	Moderate	Moderate	Moderate
			c. Increase awareness of applications and limitations.		Low	Low	Low	Low
1	1.2	1.2.3	Increase the use and efficiency (i.e., statistical power) of the IMBCR to detect changes in regional populations.					
			a. Maintain partnership support in current survey areas.	Breeding	High	High	High	High
			b. Assess the efficacy of management actions.		High	High	High	High
			c. Expand survey in regions where partnership funding is available.		Moderate	Moderate	Moderate	Moderate
			d. Increase awareness of applications and limitations.		Moderate	Moderate	Moderate	Moderate
			e. Increase availability of data to public for analysis.		Low	Low	Low	Low

Objective	*Sub-objective*	*Action*	*Description*	*Annual Cycle*	*Ranking Priority* SPPI	CCLO	MCLO	BAIS
1	1.2	1.2.4	Explore new applications and limitations of other surveys (e.g. eBird, Christmas Bird Count)	Breeding Migration Winter	Low High High	Low High High	Low High High	Low High High
1	1.2	1.2.5	Identify migration distribution.					
			a. Develop new surveys (e.g., RADAR, MOTUS Wildlife Tracking Systems, genetics).	Migration	High	High	High	High
			b. Use maps developed in Action 1.1.2 (eBird STEM) to target coordinated migration surveys.		High	High	High	High
			c. Identify important connectivity and stopover sites.		High	High	High	High
			d. Recruit and train additional observers and provide guidance for appropriate survey methods.		Moderate	Moderate	Moderate	Moderate
1	1.2	1.2.6	Expand surveys on the wintering grounds.					
			a. Assess the need across in the wintering range with insufficient coverage and/or information.	Winter	High	High	High	High
			b. Recruit and train additional observers and provide guidance for appropriate survey methods coverage.		High	High	High	High
1	1.2	1.2.7	Test operational survey assumptions (i.e., road side bias, observer effects, and species detection rates) and potential effects on resulting analyses.	All	Moderate	Moderate	Moderate	Moderate
1	1.2	1.2.8	Develop additional surveys or enhance existing surveys to inform management actions that are not addressed.	All	High	High	High	High

Objective	*Sub-objective*	*Action*	*Description*	*Annual Cycle*	*Ranking Priority* SPPI	CCLO	MCLO	BAIS
2			**Synthesize existing information and identify key knowledge gaps.**					
2	2.1		Compile and summarize current information.	All				
2	2.1	2.1.1	Identify baseline demographic parameters including information gaps in vital rates.	All	High	High	High	High
2	2.1	2.1.2	Assess relative influence of vital rates on population viability and identify limiting factors (i.e., integrated population model).	All	High	High	High	High
2	2.1	2.1.3	Synthesize existing management guidance for beneficial management practices.	All	High	High	High	High
2	2.1	2.1.4	Estimate current grassland distribution, condition, quantity, and protection status throughout the annual cycle and track changes over time.					
			a. Expand multi-JV undisturbed grassland assessment to include time series analysis.	All	Moderate	Moderate	Moderate	Moderate
			b. Support continued development of periodic regional and continental spatial land cover data.		Low	Low	Low	Low
2	2.2		Prioritize research to inform conservation delivery.					
2	2.2	2.2.1	Link occurrence and abundance and, where possible, key vital rates to habitat condition and management relative to the following stressors:					
			a. Grassland management (e.g., haying, grazing, mowing, prescribed fire, shrub removal, rest, interseeding, reseeding, cropping history) on native and non-native, plowed and unplowed, restored and reconstructed pasture.	All	High	High	High	High
			b. Landscape fragmentation (e.g. roads, agricultural and wetland edges, patch size, woody edges, shrub encroachment, and landscape composition).		High	High	High	High

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2	2.2	2.2.1 *(cont.)*	c. Energy development (e.g., oil and gas, wind, and associated infrastructure, including wells, noise, roads and trails, power lines).	All	High	High	High	High
			d. Long-term weather patterns.		High	High	High	High
			e. Non-native and invasive species.		High	High	High	High
			f. Vegetative biomass and structure.		Moderate	Moderate	Moderate	Moderate
			g. Predation.		Moderate	Moderate	Moderate	Moderate
			h. Parasitism.		Moderate	Moderate	Moderate	Moderate
			i. Pesticide.		Moderate	Moderate	Moderate	Moderate
			j. Food availability.		Low	Low	Low	Low
			k. Disease.		Low	Low	Low	Low
2	2.2	2.2.2	Identify factors influencing low occupancy or vacant habitat.	Breeding Migration Winter	Moderate Low Moderate	Moderate Low Moderate	High Low Moderate	Moderate Low Moderate
2	2.2	2.2.3	Conduct baseline studies on migration ecology, stopover habitats, migration routes, and migration behavior.	Migration	High	High	High	High
2	2.2	2.2.4	Compare habitat use, genetics, behavior in disjunct populations.	Breeding	Low	Low	High	Low
2	2.2	2.2.5	Query and synthesize information from landowners and managers on current and emerging threats and stressors.	All	Moderate	Moderate	Moderate	Moderate

Objective	*Sub-objective*	*Action*	*Description*	*Annual Cycle*	*Ranking Priority* SPPI	CCLO	MCLO	BAIS
3			**Prioritize conservation and outreach actions.**					
3	3.1	3.1.1	Quantify effects of existing conservation programs and potential scenarios.					
			a. Promote and prioritize programs benefiting or have the potential to benefit the Species. Alter, discontinue, or do not encourage implementation of ineffective or detrimental programs.	All	High	High	High	High
3	3.1	3.1.2	Develop and/or refine decision support tools to prioritize conservation efforts (i.e., protection, restoration, and enhancement).	All	High	High	High	High
3	3.1	3.1.3	Promote conservation programs and incentives to protect native and restored grassland in priority areas.					
			a. Encourage voluntary perpetual easements and/or term-limited leases (e.g., ALE, FWS, state, NGO).	All	High	High	High	High
			b. Promote management actions that prioritize grazing and promote grass-based agriculture.		High	High	High	High
3	3.1	3.1.4	Promote and increase habitat quality standards of grassland restoration programs and practices, e.g., increase patch size, reduce hard edges, minimize woody/shrub cover in key areas, minimize tame grass encroachment.					
			a. Identify focal areas for targeting restoration programs.	All	High	High	High	High
			b. Promote existing programs (e.g., CRP, EQIP, PFW) and increase incentives.	All	Moderate	Moderate	Moderate	Moderate
			c. Recommend seeding prescriptions using geographically specific native grass and forb mixes.	All	Moderate	Moderate	Moderate	Moderate
			d. Manage for appropriate shrub density.	Winter	High	High	Moderate	High
3	3.2		Improve outreach and partnership opportunities.	All				

Objective	*Sub-objective*	*Action*	*Description*	*Annual Cycle*	*Ranking Priority* SPPI	CCLO	MCLO	BAIS
3	3.2	3.2.1	Foster partnerships and engage with key stakeholders (e.g., energy, agriculture, First Nations/tribes, land trusts, ejidos).	All	High	High	High	High
3	3.2	3.2.2	Produce geographically-appropriate, stakeholder-specific Beneficial Management Practice guidance based on best available science.	All	High	High	High	High
3	3.2	3.2.3	Improve coordination in future planning efforts.	All	Moderate	Moderate	Moderate	Moderate
3	3.2	3.2.4	Identify and integrate existing planning efforts.	All	Moderate	Moderate	Moderate	Moderate
3	3.2	3.2.5	Foster international partnerships (e.g., RGJV, SJV, IMC, others) on the wintering grounds.					
			a. Develop appropriate guidance for habitats in the Chihuahuan and Sonoran deserts.	Winter	High	High	High	High
			b. Identify potential mechanisms for influencing conservation actions (e.g., prevent conversion to center pivot agriculture, reducing woody encroachment).		High	High	High	High
3	3.2	3.2.6	Foster partnerships with private landowners.	All	High	High	High	High
3	3.2	3.2.7	Make the information available to diverse Partners.	All	Moderate	Moderate	Moderate	Moderate
3	3.3		Inform policy development.	All				
3	3.3	3.3.1	Engage agricultural communities and agencies to support grass-based agriculture.	All	High	High	High	High
3	3.3	3.3.2	Education, outreach, and decision support tools for policy makers.	All	Moderate	Moderate	Moderate	Moderate