United States Department of Agriculture

Natural Resources Conservation Service

Conservation Effects Assessment Project
CEAP-Wildlife Conservation Insight

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Conservation Practices Benefit Priority Birds in the Intermountain West

Summary Findings

Through a Conservation Effects Assessment Project (CEAP) partnership, the American Bird Conservancy (ABC) and Intermountain West Joint Venture (IWJV) modeled the contribution of voluntary agriculture land treatment conservation practices in meeting IWJV population objectives for five priority grassland and shrubland bird species across portions of nine western states.

Thirteen selected practices applied during 2005–2011 were evaluated to determine their potential to influence bird habitat carrying capacity within affected land units of the Intermountain West.

The assessment revealed that although practices targeted multiple resource concerns, they met 2% of the IWJV population increase objective for long-billed curlew, nearly 1% of the grasshopper sparrow population increase objective, 1% of the Brewer's sparrow population increase objective, nearly 6% of the sagebrush sparrow population increase objective, and 1% of the sage thrasher population increase objective in the assessment area.

Potential increases on the order of 1-6% based on 7 years of conservation practice implementation show progress toward meeting IWJV 30-yr population objectives for these species. More targeted application of conservation measures, such as through the Sage Grouse Initiative (SGI), can accelerate progress in meeting population objectives. This assessment estimated that practices implemented under SGI alone resulted in meeting 1%–2% of species population objectives, with subregion increases meeting as much as 25% of population-increase objectives.

Background

Grassland and shrubland bird populations of the Intermountain West have been in decline in recent decades due to habitat conversion and degradation and other factors.

The Intermountain West Joint Venture (IWJV) and American Bird Conservancy (ABC) have built a Habitat and Populations Strategies (HABPOPS) database to inform conservation delivery in the region and help address priority bird conservation needs. The database allows generation of habitat-based population estimates and objectives for the three bird conservation regions (BCRs) comprising the majority of the IWJV: the Great Basin (BCR 9), the Northern Rockies (BCR10), and the Southern Rockies (BCR16). The HABPOPS database also allows for testing scenarios that may result in changes in vegetation association or condition and provides estimates of the predicted population response (change in carrying capacity) of priority bird species.

Assessment Partnership

Through a Conservation Effects Assessment Project (CEAP) partnership among the Natural Resources Conservation Service (NRCS), IWJV, and ABC, the HABPOPS database was used to assess and estimate the effects of voluntary agriculture land treatment conservation practices delivered through several Farm Bill programs on five bird species primarily dependent on grassland and sagebrush-dominated habitats. These five species (long-billed curlew, grasshopper sparrow, Brewer's sparrow, sagebrush sparrow, and sage thrasher) are considered species of conservation priority by the IWJV, ABC, and federal and state agencies across the species' ranges.

The scope of the assessment included the portions of BCR's 9 and 10 that are within the IWJV area and the northern portion of BCR 16 (Figure 1). The assessment focused on 13 select voluntary conservation practices delivered to address a variety of natural resource conservation concerns but also expected to influence bird habitat conditions. Practices

PHOTO: DAVE MENKE

Sage thrasher.

applied in 2005–2011 throughout the assessment area through the Environmental Quality Incentives Program (EQIP), Wildlife Habitat Incentives Program (WHIP), and the Conservation Reserve Program (CRP) were included. Practices addressed are listed in Table 1. The assessment also used the HABPOPS database to estimate the effects of more targeted conservation actions delivered through the NRCS Sage Grouse Initiative (SGI).

This conservation insight highlights assessment findings. Additional details are provided in the assessment final report (Casey 2013). Further details regarding HABPOPS database development and applications can be found in the IWJV Implementation Plan (IWJV 2013).

Assessment Approach

Primary analysis involved processing geospatial practice data records and land unit shape files by program and practice, then overlaying shape files on species models to generate estimates of the acreage affected. Estimates of potential practice delivery effects on populations were then generated relative to regional population estimates/objectives using the IWJV HABPOPS database.

HABPOPS Database

The IWJV HABPOPS database is based on the successful Hierarchical All-Bird Strategy (HABS) database of the Playa Lakes Joint Venture. It combines estimates of current habitat extent and condition with the best available data describing focal species occupancy rates and density to derive population estimates at the BCR/State polygon scale. It can be used as a strategic tool for the development of habitat projects and programs by predicting the change in

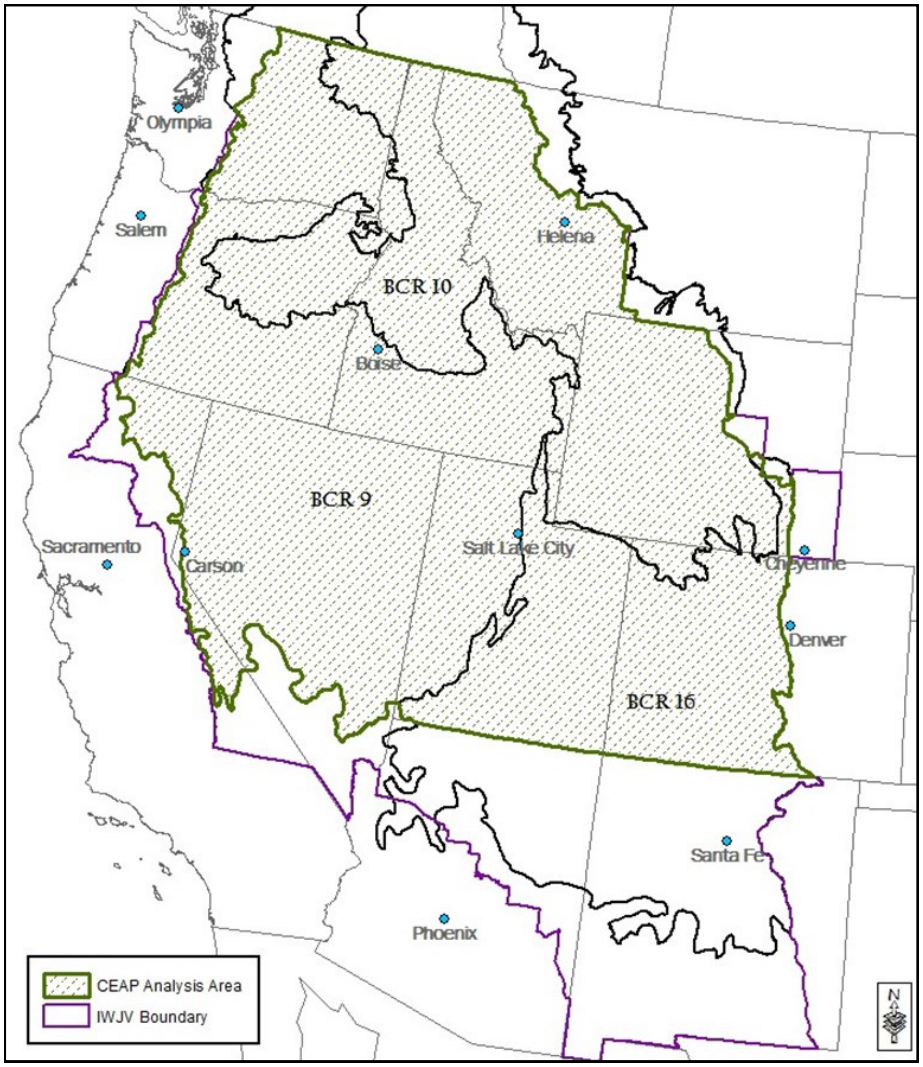

Figure 1. The analysis area covered most of Bird Conservation Regions 9 and 10 and the northern portion of BCR 16 within the Intermountain West Joint Venture.

Table 1. Number of conservation practices implemented through incentive programs for the assessment of bird populations in BCRs 9 and 10 and in the northern portion of BCR 16.

Code	Practice Name	EQIP	WHIP	CRP	Totals
314	Brush Management	686	105	6	797
327	Conservation Cover	166	27	11,675	11,868
328	Conservation Crop Rotation	1,584	0	24	1,608
338	Prescribed Burning	42	0	10	52
340	Cover Crop	683	4	21	708
342	Critical Area Planting	76	9	122	207
512	Pasture and Hay Planting	853	9	7	869
528	Prescribed Grazing	3,675	106	1,030	4,811
550	Range Planting	350	64	64	478
612	Tree/Shrub Planting	294	26	377	697
643	Restoration Rare/Decl. Habitat	58	21	23	102
644	Wetland Wildlife Habitat Mgmt.	129	23	268	420
645	Upland Wildlife Habitat Mgmt.	752	298	10,851	11,901
	Totals	9,348	692	24,478	34,518

breeding populations that will result from changes in the extent and condition of one or more habitats in a specified geographic area. It also facilitates development of "bottom-up" habitat objectives by providing a tool to examine the overall potential to change carrying capacity on the landscape and testing various scenarios to see how (or if) trend-based goals can be met. The basic building blocks of the HABPOPS database are:

Acreage. The acreage of each habitat (vegetation association) within each BCR-State polygon, calculated from compiled geospatial vegetation layers.

Condition Classes. The percentage of each habitat in defined condition classes (e.g., poor/fair/good as defined variably by canopy coverage, structure, or vegetation composition; young/mature/old growth). We used assumed ratios of 20% poor/60% fair/20% good where regional condition data sets were not available.

Predicted Occurrence. The amount of potential habitat for each focal species in each BCR-State polygon, based on predictive models combining deductive habitat associations with the mapped known range of the species.

Occupancy, Density. Occupancy rates and breeding density values for each condition class of each predicted habitat type for each focal species. These were based on the best available data, locally-derived when available.

Carrying Capacity. Potential carrying capacity (population estimate) for any given region or habitat was estimated by multiplying the area of habitat assumed to be suitable for the species times the occupancy rate, times the appropriate density value. Mapping the maximum values for each species also provided a means of displaying species distribution and key habitats. Figure 2 provides an example of carrying capacity output from the model for Brewer's sparrow.

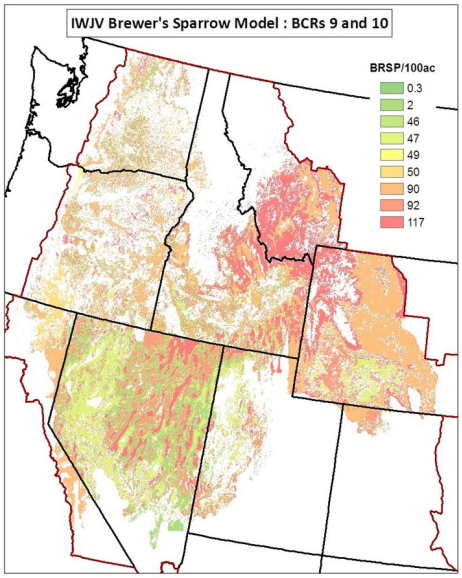

Figure 2. Brewer's sparrow (BRSP) habitat model. Colors correspond to the potential carrying capacity of the mapped vegetative associations in the HABPOPS model under the best habitat conditions.

PHOTO: DAVE MENKE

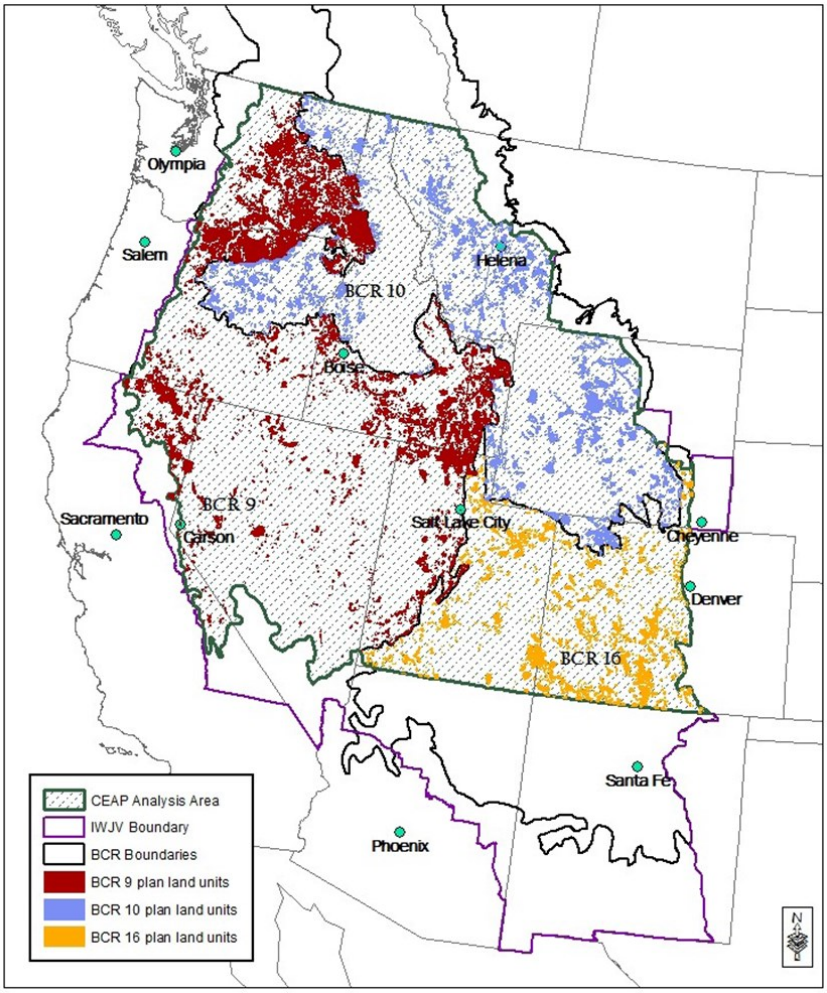

Figure 3. Distribution of all land units where EQIP, WHIP, and CRP practices were delivered during 2005–2011 for the IWJV portions of BCRs 9 and 10 and the northern portion of BCR16 (N=147,343).

The IWJV identified regional population objectives and conservation needs for landbirds in its 2013 Implementation Plan (IWJV 2013). Population estimates and 30-year objectives (by State/BCR polygon) from the IWJV are the benchmarks against which the estimated population effects of practice delivery were measured.

Potential Population Impacts by Program

Geospatial practice records applied under EQIP, WHIP, and CRP from 2005–2011 used in this analysis totaled 616,124 instances on 147,343 land units within the assessment area (Figure 3). Practice data were sorted spatially by State/BCR polygon to match the geographic units used for biological planning for focal species within the IWJV.

EQIP Practices

Prescribed Grazing (528) was the predominant practice applied through EQIP in the assessment area, comprising nearly 40% of the 9,348 instances analyzed and more than 10% of the entire EQIP/WHIP/CRP subsample (Table 1). Conservation Crop Rotation (328) was the second-most frequently implemented EQIP practice (1,584 instances).

WHIP Practices

Upland Wildlife Habitat Management (645), Prescribed Grazing (528) and Brush Management (314) were the most frequently applied practices in the WHIP subsample (Table 1). With only 692 total unique practice instances, WHIP was the least widely applied of the three programs analyzed.

CRP Practices

Although the vast majority of CRP practice instances were Conservation Cover (327), twelve of the other practices analyzed were implemented through CRP within BCRs 9 and 10 between 2005 and 2011. After sorting for duplicate and "stacked" practices, 13,083 land units remained (Table 1) with at least one practice implemented through CRP, mostly in BCR 9 in Oregon, Washington, and Idaho.

Net Effects by Program

The HABPOPS Database was used to assess the potential net effects of the delivery of selected conservation practices under each program (CRP, EQIP, and WHIP). In each instance, population estimates were generated under alternative conditions and the maximum potential effects (positive or negative) of conservation practices were estimated. These estimates were derived by clipping species model raster files with the land unit polygons associated with each respective practice set (within each program).

Condition classes assigned in the HABPOPS database were general and designed to capture the variables that affect density of the focal species. For shrubland and most grassland vegetation types, condition classes ("Poor," "Fair," and "Good") were defined. Attributes defining condition classes included characteristics such as shrub canopy cover, diversity of understory vegetation, or forest age and structural class.

Condition of sagebrush associations were defined as:

- ***Poor Condition:*** <10% sage, very low diversity/few native plants, many invasive plants
- ***Fair Condition:*** 10-20% sage, moderate native plant cover, some invasive plants
- ***Good Condition:*** >20% sage, diverse native understory, few or no invasive plants.

Condition of grassland associations were defined as:

Table 2. Conservation practices considered and the directional effects (positive, negative, or mixed) on focal species populations in grassland and sagebrush-steppe habitats. GRSP = grasshopper sparrow; LBCU = long-billed curlew; BRSP = Brewer's sparrow; SAGS = sagebrush sparrow; SATH = sage thrasher.

Practice Code	Practice Name	Bird Species				
		GRSP	LBCU	BRSP	SAGS	SATH
314	Brush Management *	+	+	-	-	-
327	Conservation Cover	+	+	+/-	+/-	
328	Conservation Crop Rotation	-	-			
338	Prescribed Burning	+/-	+/-	+/-	+/-	+/-
340	Cover Crop	+	+			
342	Critical Area Planting	+	+	+	+	+
512	Pasture and Hay Planting	+	+	-	-	-
528	Prescribed Grazing	+/-	+/-	+/-	+/-	+/-
550	Range Planting	+/-	+/-	+/-	+/-	
612	Tree/Shrub Planting	-	-	-	-	-
643	Restoration Rare/Decl. Habitat	+	+	+	+	+
645	Upland Wildlife Habitat	+	+	+	+	+

* During the assessment period (2005-2011), application of the Brush Management (314) practice was undergoing a transition from primary use to remove sagebrush (which negatively affects sage-steppe birds) to the more progressive current use to remove encroaching conifer trees (which benefits both grassland and shrubland birds). For this assessment, more conservative assumptions were made to capture potential loss of sagebrush cover in the early years.

- ***Poor Condition:*** Little residual cover, much bare ground, invasive plants prevalent
- ***Fair Condition:*** Moderate grass cover, patchy, native grass/forb mix, few invasive plants
- ***Good Condition:*** Moderate to heavy residual grass/litter, native plants prevalent.

For each practice analyzed, assumptions were made about changes in condition based on the nature of the conservation action and the associations on which it was applied (Table 2). If a practice was considered to have a positive effect on vegetation condition, the effect of the practice was assumed to move the species' density estimate for the association from the lowest to the highest condition-based estimate. Likewise, practices assumed to negatively affect vegetation condition for the species moved the species density estimate for that habitat type to the lowest condition-based estimate. No changes were attributed to practices with both positive and negative potential effect. In order to identify the most potential impact that practice delivery may have had on populations, it was assumed that any benefit accrued since initial practice delivery has been maintained through subsequent management.

Sage Grouse Initiative

Delivery of the Sage Grouse Initiative (SGI) (http://sagegrouseinitiative.com/) by the NRCS and its partners has played an important role in providing support for much-needed juniper removal, invasive species control, grazing management, and other approaches to improve and protect grouse habitat. Conservation work done through SGI has the potential to benefit other sagebrush obligate landbirds (Brewer's and sagebrush sparrows, sage thrasher). Therefore, the HABPOPS Database was also used to assess the potential effects of SGI practices delivered from 2010–2012 on this study's three sagebrush obligate focal bird species.

Analysis of SGI accomplishments was based on the total acreages of SGI EQIP and WHIP contracts delivered within each of nine state/BCR polygons. They included BCR 9 in CA, ID, NV, and OR, along with BCR 10 in CO and BCR 16 in CO and UT for conifer removal; BCR 9 in UT and WA were added for analyses of other treatments.

PHOTO: ROBERT BURTON

Long-billed curlew

Findings

Potential Population Effects by Program

This assessment developed the first comprehensive population estimates for the five focal species on the selected land units, by conservation program, and by BCR/state polygon within BCRs 9 and 10 and the northern portion of BCR 16 within the IWJV. For each of the five grassland and sage-steppe dependent species, these population estimates define the scope of potential influences of implemented practices within each program by estimating what percentage of the current carrying capacity occurs on the affected land units. Table 3 presents summary estimates for the five focal species. For a more detailed breakout of findings by BCR/state polygons, see Casey (2013).

Table 3. Estimated population (carrying capacity) of five featured grassland and sagebrush bird species inhabiting the assessment area portions of BCRs 9, 10, and 16 and population estimates for the combined land units where selected conservation practices were applied 2005-2011 under EQIP, WHIP, and CRP.

Species	Total Population Estimate	EQIP		WHIP		CRP		All Programs	
		Pop. Est.	% Pop	Pop. Est.	% Pop	Pop. Est.	% Pop	Pop. Est.	% Pop
Long-billed curlew	203,430	1,921	0.94	100	0.05	989	0.49	3,010	1.40
Grasshopper sparrow	158,630	2,829	1.78	-	-	3,984	2.51	6,813	4.29
Brewer's sparrow	71,074,900	902,056	1.27	105,451	0.15	99,229	0.14	1,106,736	1.56
Sagebrush sparrow	20,431,300	258,987	1.27	37,934	0.19	15,594	0.08	312,515	1.53
Sage thrasher	6,531,330	67,006	1.03	16,991	0.26	11,500	0.18	95,497	1.46

Net population changes (increases) estimated for each of the five focal bird species in the study area in response to practices delivered through EQIP, WHIP, and CRP are presented in Tables 4, 5, and 6, respectively. While acreages affected and population changes are informative, a key metric presented in the tables is the percent of the IWJV population increase objective that is met through habitat improvements associated with conservation practices delivered by the various programs.

EQIP. Net positive effects of conservation practice delivery under the EQIP program were predicted for each of the five species analyzed (Table 4). Net increases in carrying capacity of <1% of the IWJV population goals were predicted for all but the sagebrush sparrow, for which a net increase of nearly 5% was predicted (Table 4).

Grazing enhancements through brush management (314), prescribed grazing (528) and range planting (550), combined with upland wildlife habitat management (645), were the primary practices contributing to increases in long-billed curlew and grasshopper sparrow carrying capacity (Casey 2013).

Most predicted net benefits to sagebrush obligate birds accrued under EQIP assume that the benefits of prescribed grazing (528) offset some of the losses due to brush removal (314). In the case of the Brewer's sparrow, brush removal was predicted to reduce carrying capacity by nearly 95,000 birds, but prescribed grazing improved carrying capacity by more than 500,000 birds. Those predicted benefits were only accrued if the grazing system protected shrubs, reduced invasives, and protected the diversity of native forbs and grasses.

Almost all of the net increase in sagebrush sparrow carrying capacity delivered under EQIP (>180,000 birds, or nearly 5% of the IWJV objective for the analysis area) came from prescribed grazing (Casey 2013).This was also the case for the sage thrasher, where a gain of >23,000 birds offset a loss of more than 5,000 birds due to brush management.

WHIP. There was very little overlap of WHIP delivery and grassland bird species models. Net gains in carrying capacity were well below 1% for both long-billed curlew and grasshopper sparrow (Table 5). Predicted net gains for all three sagebrush species came primarily through upland wildlife habitat management (645), again offsetting predicted losses caused through delivery of brush management practices. In every case, net gains were also less than 1%, with prescribed grazing (528) and upland wildlife habitat management being the major contributing positive factors (Casey 2013).

CRP. The vast majority of practice delivery under CRP has been conservation cover (327), typically with grasses and forbs. In the case of long-billed curlews, calculations of net increases of 630 birds (Table 6) assumed that most CRP conservation cover overlapping the species range used native seed mixes and/or that sites were enhanced by managed grazing or mowing.

Grasshopper sparrows have shown positive responses to CRP conservation cover, both native and non-

Table 4. Net predicted population change (Pop. Δ) of five focal species in response to conservation practices delivered through **EQIP** from 2005 to 2011 in BCRs 9 and 10 and the northern half of BCR16 within the IWJV, and the percent of species-specific IWJV population increase objective predicted to have been met through these practices within the study area.

	BCR 9		BCR 10		BCR 16		Total Study Area	
Species	Acres	Pop. Δ	Acres	Pop. Δ	Acres	Pop. Δ	Pop. Δ	% of IWJV Pop. Increase Objective
Long-billed curlew	192,185	246	188,015	228	27,890	0	474	0.72
Grasshopper sparrow	220,028	189	327,230	287	99,381	76	552	0.43
Brewer's sparrow	402,895	173,798	885,303	368,331	229,871	24,343	566,472	0.91
Sagebrush sparrow	369,714	42,571	659,790	132,248	210,754	5,362	180,181	4.96
Sage thrasher	325,098	4,460	315,267	17,131	270,568	1,784	23,375	0.80

Table 5. Net predicted population change (Pop. Δ) of five focal species in response to conservation practices delivered through **WHIP** from 2005 to 2011 in BCRs 9 and 10 and the northern half of BCR16 within the IWJV, and the percent of species-specific IWJV population increase objective predicted to have been met through these practices within the study area.

	BCR 9		BCR 10		BCR 16		Total Study Area	
Species	Acres	Pop. Δ	Acres	Pop. Δ	Acres	Pop. Δ	Pop. Δ	% IWJV of Pop. Increase Objective
Long-billed curlew	29,877	69	48,207	11	95	0	80	0.12
Grasshopper sparrow	6,255	6	5,640	9	0	0	15	0.01
Brewer's sparrow	51,200	5,357	126,620	9,550	299,637	6,421	21,328	0.03
Sagebrush sparrow	31,516	2,055	114,522	11,359	84,577	2,293	15,707	0.43
Sage thrasher	52,720	631	122,174	923	91,869	519	2,073	0.07

Table 6. Net predicted population change (Pop. Δ) of five focal species in response to conservation practices delivered through **CRP** from 2005 to 2011 in BCRs 9 and 10 and the northern half of BCR16 within the IWJV, and the percent of species-specific IWJV population increase objective predicted to have been met through these practices within the study area.

	BCR 9		BCR 10		BCR 16		Total Study Area	
Species	Acres	Pop. Δ	Acres	Pop. Δ	Acres	Pop. Δ	Pop. Δ	% IWJV of Pop. Increase Objective
Long-billed curlew	344,617	572	45,204	57	313	1	630	0.96
Grasshopper sparrow	301,479	440	19,317	14	130	0	454	0.35
Brewer's sparrow	124,691	49,168	31,582	11,720	6,847	1,797	62,685	0.10
Sagebrush sparrow	35,632	4,505	21,293	1,859	7,429	1,024	7,388	0.20
Sage thrasher	128,073	5,560	31,016	1,118	7,539	468	7,196	0.24

native, elsewhere in their range (Dechant et al. 1998, Haufler 2005). The small net gains predicted for grasshopper sparrows, equating to less than 1% of objective increases, is attributed to the fact that much of the CRP delivery in the study area did not overlap the modeled habitat for the species. The largest gains were in BCR 9 (Table 6).

All net calculations of the potential influence of CRP practice delivery on the three sagebrush obligate focal species include benefits from conservation cover (327) delivery that would only be accrued if sagebrush cover was a significant component of the cover provided. Since most CRP delivery moves plowed ground into grass/forb cover, the actual effects of this practice delivery on the nesting density of sagebrush obligates are likely to be neutral.

Sage Grouse Initiative

Tables 7 through 9 summarize the results of the analysis on the potential population effects of conifer removal, grazing management, weed control, and revegetation efforts implemented under SGI on the three sagebrush-obligate focal species, for the states and BCR polygons for which we had access to acreage and location data. It is important to note that these tables do not include data

Table 7. Predicted maximum population response by **Brewer's sparrows** to conservation practices implemented through the Sage Grouse Initiative, 2010-2012. Calculations are from the IWJV HABPOPS database, assessed against population objectives from the 2013 IWJV Implementation Plan, for nine state/ BCR polygons (IWJV 2013).

Treatment	Acres treated	Net Pop. Increase	IWJV Pop. Increase Objective	% of IWJV Pop. Inc. Objective
Conifer Removal	187,094	80,552	43,390,570	0.19
Grazing Management	598,150	295,783	48,433,416	0.61
Weed Management	9,735	4,538	48,433,416	0.01
Revegetation	25,939	23,148	48,433,416	0.05
All	820,917	404,021	48,433,416	0.83

Table 8. Predicted maximum population response by **sagebrush sparrows** to conservation practices implemented through the Sage Grouse Initiative, 2010-2012. Calculations are from the IWJV HABPOPS database, assessed against population objectives from the 2013 IWJV Implementation Plan, for nine state/ BCR polygons (IWJV 2013).

Treatment	Acres treated	Net Pop. Increase	IWJV Pop. Increase Objective	% of IWJV Pop. Inc. Objective
Conifer Removal	187,094	6,847	2,748,076	0.25
Grazing Management	598,150	51,805	2,898,784	1.79
Weed Management	9,735	687	2,898,784	0.02
Revegetation	25,939	5,421	2,898,784	0.19
All	820,917	64,760	2,898,784	2.23

from Montana or Wyoming, where significant additional investments were delivered through SGI.

The IWJV objectives for increasing Brewer's sparrows primarily call for doubling populations, based on past and ongoing declines (Rich et al. 2004). But the species is abundant, and objective increases are therefore in the tens of millions. While predictions therefore put the benefits of SGI delivery to this species in the range of <1% of objectives overall, the analysis nevertheless estimates that SGI has resulted in raising the carrying capacity of the analysis area by more than 400,000 birds (Table 7). The biggest gains are predicted to come from grazing systems implementation in BCR 9 in Idaho and Washington and from conifer removal in BCR 9 in Oregon (Casey 2013). Recent assessment work in conifer removal areas is confirming these benefits (Sage Grouse Initiative 2015).

Implementation of grazing systems under SGI contributed the most toward meeting objectives for the sagebrush sparrow, with predicted carrying capacity increases of more than 50,000 birds (Table 8). Increases equated to >4% of objectives in Colorado (BCRs 10 and 16), >5% in Idaho (BCR 9), and more than 60% in Washington (BCR 9). The assessment indicates that SGI has met >2% of the IWJV objectives for the species in the analysis area in just three years of practice delivery, across that portion of the IWJV that was analyzed.

Sage thrasher carrying capacity increased by just under 1% of IWJV objectives from SGI delivery through 2012 (Table 9). The greatest gains have come through delivery of improved grazing systems on nearly 600,000 acres. Taken as a whole, the combination of practices delivered through SGI have resulted in a predicted response meeting nearly 10% of the objective increases for sage thrasher in Colorado (BCRs 10 and 16, Casey 2013).

Conclusions

Agricultural conservation programs and practices delivered to address a variety of resource concerns clearly have the potential to benefit birds across broad geographical scales and in multiple habitats. This assessment quantified that potential associated with select practices delivered within the IWJV in portions of the three largest western U.S. Bird Conservation Regions between 2005 and

Table 9. Predicted maximum population response by **sage thrashers** to conservation practices implemented through the Sage Grouse Initiative, 2010-2012. Calculations are from the IWJV HABPOPS database, assessed against population objectives from the 2013 IWJV Implementation Plan, for nine state/BCR polygons (IWJV 2013).

Treatment	Acres treated	Net Pop. Increase	IWJV Pop. Increase Objective	% of IWJV Pop. Inc. Objective
Conifer Removal	187,094	3,011	2,334,990	0.13
Grazing Management	598,150	20,401	2,598,346	0.79
Weed Management	9,735	372	2,598,346	0.01
Revegetation	25,939	2,239	2,598,346	0.09
All	820,917	26,023	2,598,346	1.00

2011. Thirteen practices were assessed across three large conservation programs for five of the highest priority grassland- and sagebrush-dependent bird species in the IWJV region.

Approximately 1.5% of the long-billed curlew population of the analysis area occurs on the lands where the selected practices were applied, and the net potential effect of these practices was to raise the carrying capacity of those lands by 1,184 curlews, or nearly 2% of the IWJV objective increase for the analysis area. The primary potential contributing practices to this increase were Brush Management (314) and Upland Wildlife Habitat Improvement (645) delivered through EQIP.

Approximately 4.3% of the grasshopper sparrow population of the analysis area occurs on the lands where the selected practices were applied, and the net potential effect of those practices was to raise the carrying capacity of those lands by 1,021 individuals, or nearly 1% of the IWJV objective increase for the analysis area. The primary potential contributing practices to this increase were Conservation Cover (327) in the CRP program, and Prescribed Grazing (528) delivered through EQIP.

Approximately 1.6% of the Brewer's sparrow population of the analysis area occurs on lands where the selected practices were implemented, and the net potential effect of practice delivery was to raise the carrying capacity of those lands by 627,654 individuals, or 1% of the IWJV objective increase for the analysis area. The primary practice contributing to this potential increase was Prescribed Grazing (528) delivered through EQIP and WHIP. Conservation Cover (327) delivered through CRP also contributed, with the caveat that those increases would only be realized if said cover had a significant shrub component.

Approximately 2.8% of the sagebrush sparrow population of the analysis area occurs on the lands where the selected practices were implemented, and the net potential effect of practice delivery was to raise the carrying capacity of those lands by 210,384 individuals, or nearly 6% of the IWJV objective increase for the analysis area. The primary potential contributing practices to this increase were Prescribed Grazing (528) and Upland Wildlife Habitat Management (645) delivered through EQIP and WHIP, respectively, and Conservation Cover (327) in the CRP program (with the caveat that those increases would only be realized if said cover had a significant shrub component).

Approximately 1.5% of the sage thrasher population of the analysis area occurs on the lands where the selected practices were implemented, and the net potential effect of practice delivery was to raise the carrying capacity of those lands by 32,594 individuals, or 1% of the IWJV objective increase for the analysis area. The primary potential contributing practices to this increase were Prescribed Grazing (528) and Upland Wildlife Habitat Management (645) delivered through EQIP and WHIP, respectively, and Conservation Cover (327) in the CRP program (with the caveat that those increases would only be realized if said cover had a significant shrub component).

Potential increases on the order of 1-6% based on seven years of conservation practice implementation may be adequate progress toward the 30-yr population objectives for these species, where objective increases vary from a low of 10% (e.g., sagebrush sparrow in BCR 10; sage thrasher in BCR 9) to 100% (doubling) for Brewer's sparrow in BCR 9.

The vast majority of voluntary practices implemented and analyzed by this assessment were applied to meet

multiple resource concerns, and most were likely not specifically designed or located to benefit the focal species. Simply applying these practices broadly across the geography still resulted in overlap with the modeled (occupied) habitats of focal species, but a priori selection of treatment areas focused on wildlife could greatly increase benefits. Furthermore, although the assessment assumes that practices applied met the specific habitat needs of focal species, they were rarely an objective of practice application. More targeted application of conservation measures both on selected habitats and designed to provide specific desired habitat conditions could certainly result in population increases exceeding current predictions (i.e., making more progress toward regional population goals).

The SGI is one example of such a targeted conservation approach, and because it is aimed specifically at a widespread sagebrush-obligate bird, we predicted that tangible progress has been made toward meeting the objectives set for the three focal sagebrush obligate species. The combination of conifer removal, grazing system implementation, weed management, and revegetation implemented under SGI alone has potentially resulted in meeting 1% of the Brewer's sparrow objectives for the analysis area, 2% of the sagebrush sparrow objectives, and 1% of the sage thrasher objectives, with subregion (state/BCR) increases meeting as much as 25% or more of objectives. These were all achieved on fewer acres and at fewer sites than recent dispersed implementation under the EQIP, WHIP, and CRP programs.

Predictive models are no replacement for the collection of site-specific research and monitoring that ties specific population response to management activities and resultant habitat changes on the ground, and toward that end the IWJV has been working with the University of Montana and other researchers to assess site-specific bird response (see Sage Grouse Initiative 2015). But the HABPOPS tool, and its use to assess both broad-scale and targeted implementation, can help inform where and how to maximize the benefits of conservation program and practice delivery. ABC, Point Blue Conservation Science, and the IWJV have created a web-based HABPOPS tool that can be used to assess the potential effects of program or project delivery in a regional context. The tool is available at http://data.pointblue.org/partners/iwjv/index.html.

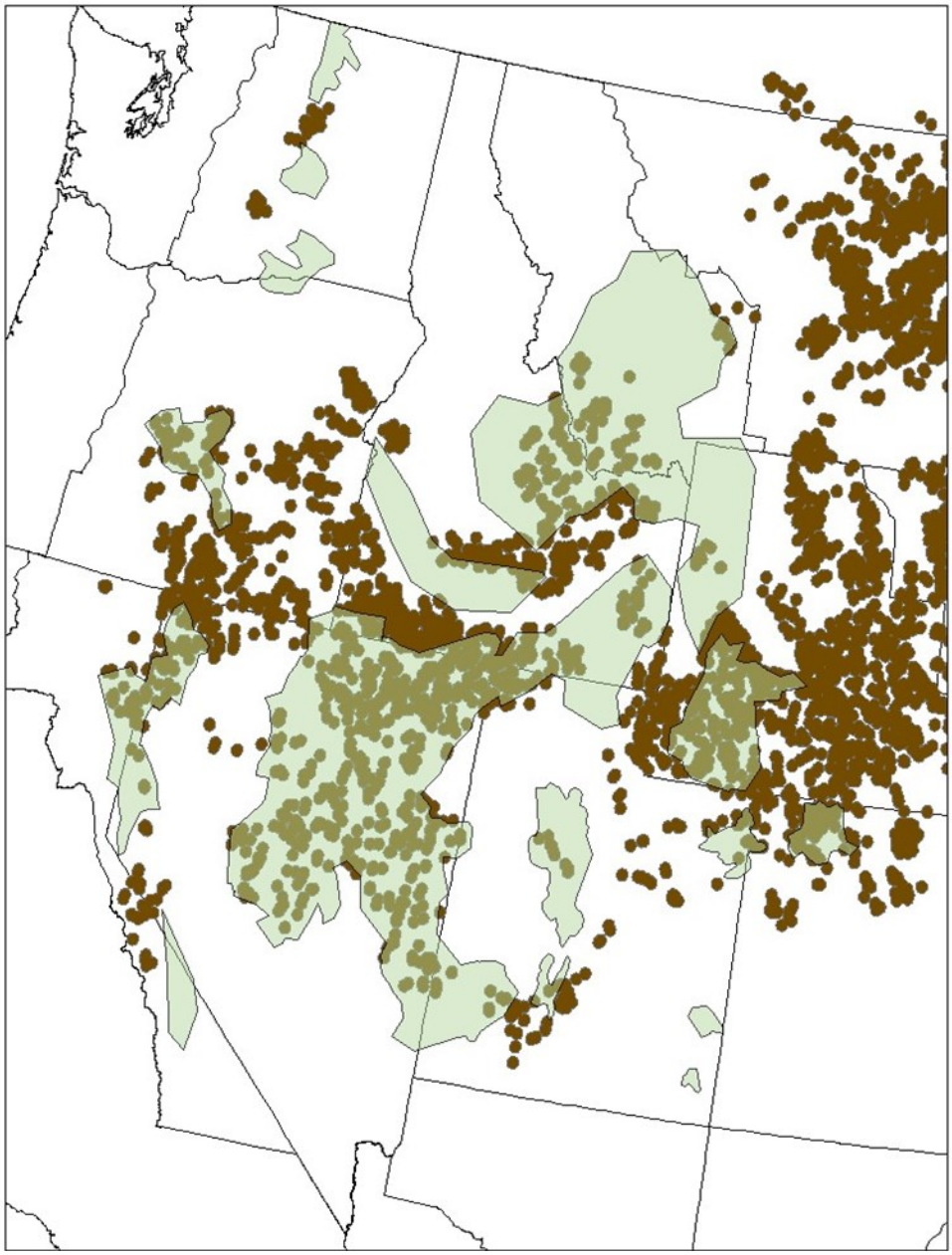

Figure 4. Draft focal areas for sagebrush-obligate landbirds (Brewer's and sagebrush sparrow, sage thrasher; green), overlain by the 100% density polygons (brown) for the greater sage-grouse.

Species- or habitat-specific initiatives, such as the Sage Grouse Initiative, or special EQIP programs delivered in strategically located habitats may best meet the needs of sagebrush-obligate and grassland birds. Toward that end, ABC has worked with the IWJV and the Western Working Group of Partners in Flight to identify focal areas for sagebrush-obligate landbirds (other than sage-grouse), using HABPOPS output and other sources (Figure 4). Adoption of these areas, and further refinement of decision-support tools such as the HABPOPS database, can make the ambitious population objectives of the IWJV achievable. Part of the ongoing refinement of those focal areas will be to review them in light of SGI analysis and further implementation, to see where outside the range of the sage-grouse species conservation will be most effective.

PHOTO: DAVE MENKE

Sagebrush sparrow.

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The Conservation Effects Assessment Project: Translating Science into Practice

The Conservation Effects Assessment Project (CEAP) is a multi-agency effort to build the science base for conservation. Project findings will help to guide USDA conservation policy and program development and help farmers and ranchers make informed conservation choices.

One of CEAP's objectives is to quantify the environmental benefits of conservation practices for reporting at the national and regional levels. Because wetlands are affected by conservation actions taken on a variety of landscapes, the CEAP-Wildlife national assessment complements the national assessments for cropland, wetlands, and grazing lands. The wildlife national assessment works through numerous partnerships to support relevant assessments and focuses on regional scientific priorities.

This assessment was conducted through a partnership among NRCS, The American Bird Conservancy (ABC), and the Intermountain West Joint Venture (IWJV). Primary investigators on this project were Dan Casey (ABC) and Dave Smith (IWJV).

For more information, visit www.nrcs.usda.gov/technical/NRI/ceap/ or contact Charlie Rewa at charles.rewa@wdc.usda.gov.

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