State of Nevada
Sagebrush Ecosystem Program

SEMI-ANNUAL REPORT

May 2024

STATE OF NEVADA
SAGEBRUSH ECOSYSTEM PROGRAM

The *Semi-Annual Report* is a product of the Nevada Sagebrush Ecosystem Program (SEP). The Sagebrush Ecosystem Technical Team (SETT) and Sagebrush Ecosystem Council (SEC) submit this document semi-annually to report on the status of Greater Sage-grouse and the sagebrush ecosystem in Nevada, the Progress of the Nevada Conservation Credit System (CCS), as well as other strategies, programs, or projects carried out in pursuant of NRS 321.592 and NRS 321.594.

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The Sagebrush Ecosystem Council's mission is to maintain and restore a functional and resilient sagebrush ecosystem to benefit all species while allowing for various land uses. This will be accomplished by working through a diverse coalition of public and private stakeholders.

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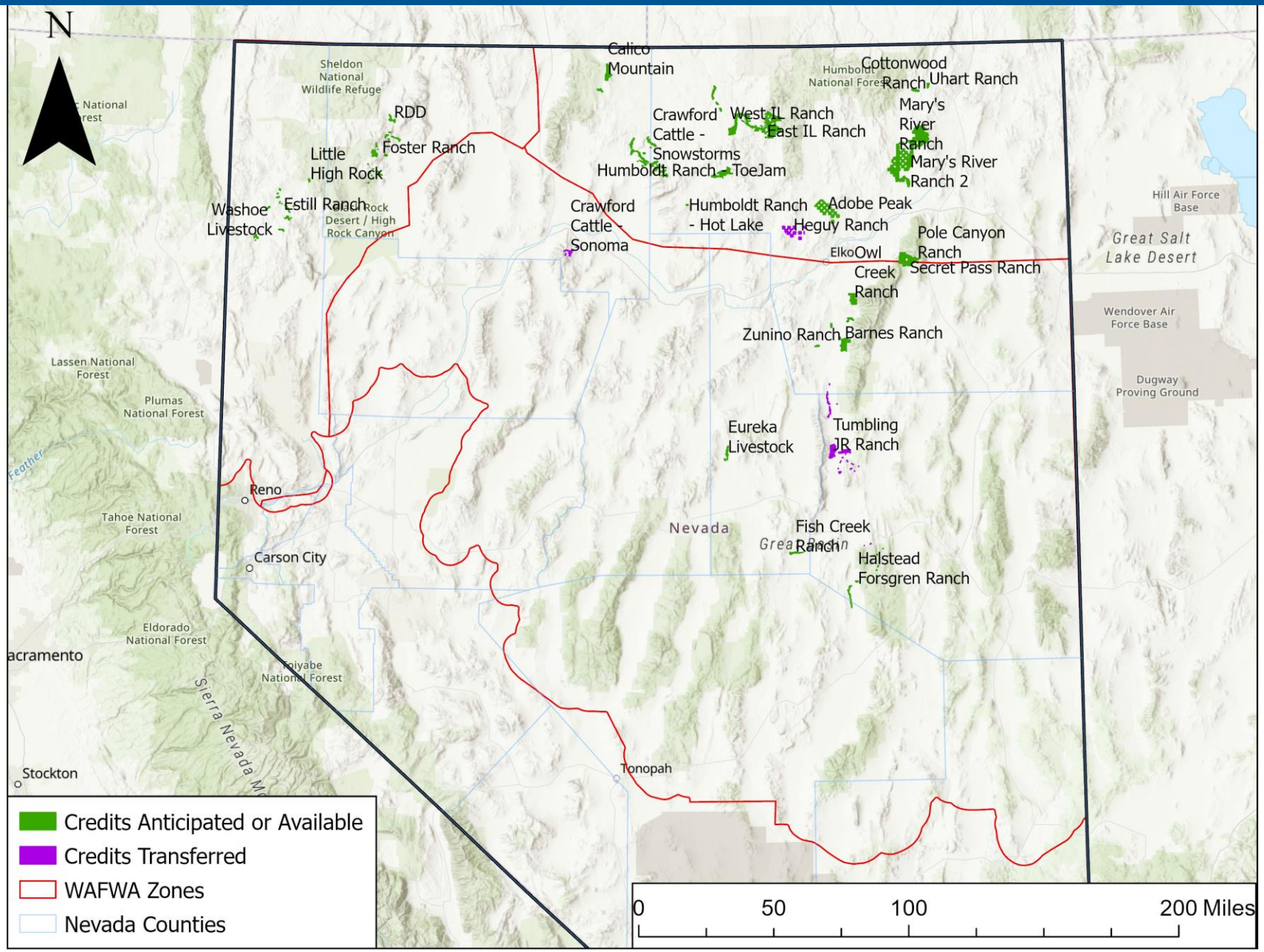
BACKGROUND INFO

- The SEP was legislatively established in 2013. Work to develop a system for mitigating authorized adverse impacts (disturbances) to sagebrush ecosystems in the State promptly began, and the Conservation Credit System was adopted in December 2014.
- A primary goal expressed by all stakeholders was to ensure, based on best available science, that the system could be applied consistently to quantify authorized adverse impacts to Greater Sage-grouse habitat (debits), and preservation and restoration projects (credits). To achieve this goal, the Habitat Quantification Tool (HQT) was developed and approved by the Council.
- The 2015 Legislature appropriated funds to be used for grants to "kick start" credit projects. Funding was awarded initially in 2016, but several landowners began credit projects on their own without any state funding.
- The transfer of credits began in 2017. However, transfers stalled upon the issuance of Instructional Memorandum (IM) 2019-018 by the Department of Interior on December 6, 2018 directing that the Bureau of Land Management (BLM) could only require mitigation on federal lands if there was a state regulation requiring it.
- Because most disturbances occur on lands managed by the BLM, Nevada became more at risk of having the Greater Sage-grouse listed as threatened or endangered species due to lack of regulatory mechanisms to mitigate disturbances.
- In response, the Sagebrush Ecosystem Council immediately began work on a regulation requiring mitigation on public lands. A permanent regulation was passed in 2019.
- A combination of continuous program engagement and the adoption of the regulation has resulted in a significant increase in credit project development and CCS mitigation transactions.
- Nevada began development of the mitigation program after many other western states with Sage-grouse habitat had begun development of their systems. Nevada is considered a regional leader in the implementation of a conservation credit system or habitat exchange, being one of the first to have finalized several transactions.

CREDIT SUMMARY

CCS CREDIT PROJECTS



ANTICIPATED AND AVAILABLE CREDITS

Two new credit projects anticipate conducting fieldwork this year. Both ranches fall primarily in Priority and General Habitat Management Areas and can potentially conserve over 3,000 acres for sage-grouse. Preliminary estimates indicate these projects can add an estimated 1,000 credits to the System.

PROJECT NAME	CREDITS	COUNTY	ACRES	WAFWA MGMT. ZONE	STATE SEED FUNDED**
		ANTICIPATED CREDITS*			
Washoe Livestock	TBD	Washoe	799	V	Privately Funded
East IL Ranch	TBD	Elko	23,721	IV	Privately Funded
Calico Mountain	TBD	Humboldt	5,120	IV	State Seed Funded
Little High Rock	TBD	Washoe	322	V	Privately Funded
Fish Creek Ranch	TBD	Eureka	1,180	III	Privately Funded
Barnes Ranch	TBD	Elko	4,981	III	Privately Funded
Mary's River Ranch 2	TBD	Elko	54,833	IV	Privately Funded
Uhart Ranch	TBD	Elko	690	IV	Privately Funded
Halstead Forsgren Ranch	TBD	Nye/White Pine	2,437	III	Privately Funded
TOTAL	**~24,000**		**94,083**		

PROJECT NAME	CREDITS	COUNTY	ACRES	WAFWA MGMT. ZONE	STATE SEED FUNDED**
		AVAILABLE CREDITS			
Cottonwood Ranch	638	Elko	685	IV	State Seed Funded
West IL Ranch	539	Elko	All Acres Conserved	IV	Privately Funded
Crawford Cattle - Snowstorms	1,234	Humboldt, Elko	6,598	IV	State Seed Funded
Estill Ranch	68	Washoe	804	V	Privately Funded
Eureka Livestock	1,742	Eureka	1,623	III	State Seed Funded
Adobe Peak	3,618	Elko	6,726	IV	Privately Funded
Humboldt Ranch - Hot Lake	694	Elko	198	IV	Privately Funded
Humboldt Ranch - Toejam	1,920	Elko	5,330	IV	Privately Funded
East IL Ranch	8,272	Elko	23,235	IV	Privately Funded
Secret Pass Ranch	3,621	Elko	10,043	III, IV	State Seed Funded
Owl Creek Ranch	2,299	Elko	4,125	III	State Seed Funded
Foster Ranch	1,624	Humboldt	6,170	V	State Seed Funded
Pole Canyon Ranch	435	Elko	2,068	IV	Privately Funded
Mary's River Ranch	1,441	Elko	2,236	IV	Privately Funded
Zunino Ranch	2,195	Elko	3,217	III	Privately Funded
TOTAL	**30,340**		**73,058**		

* Anticipated credits are estimated, but not finalized or eligible for transfer/sale.
** Available Credits are finalized and eligible for transfer/sale to mitigate for anthropogenic disturbances.
*** Projects receiving state seed funding also included varying amounts of matching funds from the landowners.

CREDIT TRANSFERS

DEBIT PROJECT	CREDITS TRANSFERRED OR SOLD	CREDIT PROJECT	ACRES CONSERVED**	WAFWA MGMT. ZONE
		Transactions*		
Bald Mountain Mine	2,514	Tumbling JR Ranch	9,717	III
Greater Phoenix Mine	243	West IL Ranch	6,279	IV
Greater Phoenix Mine - Philadelphia Canyon	5	West IL Ranch	Acres Included in other Transaction	IV
Coeur Rochester Mine	467	Crawford Cattle - Sonoma	1,498	III
Coeur Rochester Mine	186	Crawford Cattle - Snowstorms	1,313	IV
Baltazor Geothermal	292	Crawford Cattle - Snowstorms	1,033	IV
Midas Exploration	22	Estill Ranch	346	V
Avocado Exploration	44	Crawford Cattle - Snowstorms	254	IV
Newcrest Exploration Phase I	3	Cottonwood Ranch	13	IV
Fish Springs Solar	59	Heguy Ranch	26	IV
Western Oil Exploration	5	Crawford Cattle - Snowstorms	Acres Included in other Transaction	IV
Jerritt Canyon Exploration	45	Cottonwood Ranch	103	IV
Snow Canyon Mine Closure	2	Cottonwood Ranch	Acres Included in other Transaction	IV
Twin Creeks Mine - Sage Tailings	35	West IL Ranch	Acres Included in other Transaction	IV
Tungsten Mountain Solar	5	Crawford Cattle - Snowstorms	1,332	IV
Dixie Meadows Geothermal	104	Crawford Cattle - Snowstorms	Acres Included in other Transaction	IV
South Railroad Exploration	9	Heguy Ranch	Acres Included in other Transaction	IV
Peterson Mountains Mine	1	Heguy Ranch	Acres Included in other Transaction	IV
White Pine Hydropower Pump Exploration	9	Secret Pass Ranch	226	III, IV
Cherry Creek Tower	3	Secret Pass Ranch	Acres Included in other Transaction	III, IV
Round Springs Tower	3	Secret Pass Ranch	Acres Included in other Transaction	III, IV
Lincoln Hill Exploration	9	Heguy Ranch	Acres Included in other Transaction	IV
Round Mountain Mine	45	Tumbling JR Ranch	Acres Included in other Transaction	III
SW Energy Road	13	Cottonwood Ranch	Acres Included in other Transaction	IV
Big Ledge - Dry Creek Mine Closure	310	Mary's River Ranch	463	IV
Western Lithium Mine	550	Estill Ranch	1,901	V
TOTAL	**4,983**		**24,504**	

- Reserve account contributions associated with transfers are excluded from this table. Proximity factors associated with the transactions are included.

** "Acres Included in other Transaction" refers to acres already accounted for in a previous transaction, as all credits within a Credit Project map unit are required to be managed in their entirety, regardless of the number of credits transferred within.

CREDIT TRANSFERS CONTINUED

DEBIT PROJECT	CREDITS TRANSFERRED OR SOLD	CREDIT PROJECT	ACRES CONSERVED**	WAFWA MGMT. ZONE
		Transactions*		
Baker Ranch Powerline	1	Cottonwood Ranch	Acres Included in other Transaction	IV
Gold Bar South Mine	662	Heguy Ranch	3,397	IV
South Railroad Exploration	24	Heguy Ranch	Acres Included in other Transaction	IV
Beehive Telephone Fiber Optic	2	Heguy Ranch	Acres Included in other Transaction	IV
Gold Bar South Mine	127	Cottonwood Ranch	306	IV
White Pine Hydropower Pump Exploration	6	Secret Pass Ranch	Acres Included in other Transaction	III, IV
Bald Mountain Mine	462	Tumbling JR Ranch	Acres Included in other Transaction	III
Robinson Mine	201	Owl Creek Ranch	631	III
Marigold - Valmy Mine	59	Owl Creek Ranch	Acres Included in other Transaction	III
Great Basin Diamond 1-27 APD Exploration	5	Owl Creek Ranch	Acres Included in other Transaction	III
Crescent Valley Exploration	5	Crawford Cattle - Snowstorms	Acres Included in other Transaction	IV
Robertson Exploration One	7	West IL Ranch	Included in other Transaction	IV
Goldrush Mine	2,037	West IL Ranch	Included in other Transaction	IV
Goldrush Exploration	26	West IL Ranch	Included in other Transaction	IV
Goldrush Mine	601	East IL Ranch	486	IV
Marigold - Valmy Mine	332	Owl Creek Ranch	607	III
Green Springs Exploration	13	Owl Creek Ranch	Acres Included in other Transaction	III
Golden Lake Exploration	6	Owl Creek Ranch	Acres Included in other Transaction	III
Prospect Mine - Gullsil Expansion	12	Owl Creek Ranch	Acres Included in other Transaction	III
North Peak Exploration	1	Owl Creek Ranch	Acres Included in other Transaction	III
Dodge Flat II Solar	1	Owl Creek Ranch		III
Bald Mountain Mine	1,143	Tumbling JR Ranch	Included in other Transaction	III
Bald Mountain Mine	93	Adobe Peak	4,175	IV
TOTAL	**5,826**		**9,602**	
ALL TRANSACTIONS TOTAL	**10,809**		**34,106**	

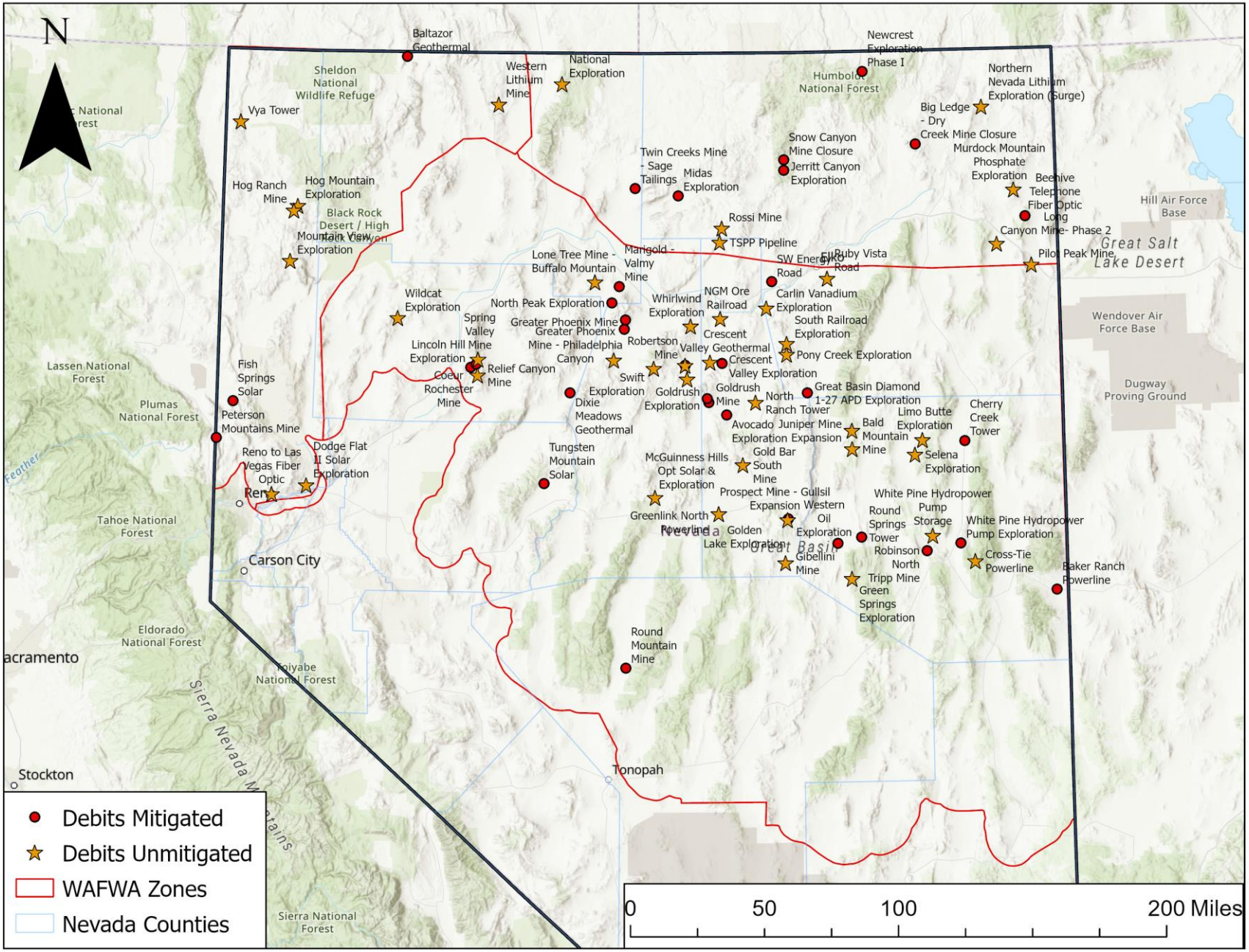
Fifty mitigation transactions have been finalized using the CCS since inception of the program, conserving approximately 34,000 acres for at least a 30-year term.

- Reserve account contributions associated with transfers are excluded from this table. Proximity factors associated with the transactions are included.

** "Acres Included in other Transaction" refers to acres already accounted for in a previous transaction, as all credits within a Credit Project map unit are required to be managed in their entirety, regardless of the number of credits transferred within.

DEBIT SUMMARY

CCS DEBIT PROJECTS



UNMITIGATED DEBITS

PROJECT NAME	DEBITS*	COUNTY	ACRES OF DIRECT IMPACT**	WAFWA MGMT. ZONE
		ANTICIPATED DEBITS***		
Bald Mountain Mine	1,132	White Pine	5,734	III
Western Lithium Mine	875	Humboldt	5,169	V
Long Canyon Mine- Phase 2	1,676	Elko	815	III, IV
Lone Tree Mine - Buffalo Mountain	271	Humboldt	4	III
Gibellini Mine	1,961	Eureka, Nye, White Pine	328	III
Robertson Mine	2,013	Lander	2,643	III
Relief Canyon Mine	33	Pershing	0	III
Carlin Vanadium Exploration	TBD	Elko	85	III
National Exploration	28	Humboldt	37	IV
TSPP Pipeline	4	Elko, Eureka	1	IV
Jerritt Canyon Exploration	39	Elko	384	IV
Ruby Vista Road	2	Elko	2	III
Big Ledge - Dry Creek Mine Closure	5	Elko	118	IV
South Railroad Exploration	41	Elko	126	III
Prospect Mine - Gullsil Expansion	20	Eureka	28	III
Rossi Mine	TBD	Elko	1,094	IV
Gold Bar South Mine	1,372	Eureka	210	III
Juniper Mine Expansion	869	Elko, White Pine	2,300	III
White Pine Hydropower Pump Storage	827	White Pine	860	III
Selena Exploration	128	White Pine	200	III
Hog Ranch Mine	5,831	Washoe	456	V
Greenlink North Powerline	TBD	Churchill, White Pine, Eureka	599	III
NGM Ore Railroad	2,926	Eureka, Lander, Elko	1,755	III, IV
Cross-Tie Powerline	TBD	White Pine	2,912	III
North Ranch Tower	188	Eureka	1	III
Limo Butte Exploration	26	White Pine	200	III
McGuinness Hills Opt Solar & Exploration	13	Lander	235	III
Mountain View Exploration	TBD	Washoe	0	V
Pilot Peak Mine	TBD	Elko	228	III, IV
TOTAL	**~31,400**		**26,524**	

* Debits listed are the total of both term and permanent debits
** Direct impact refers to the disturbance footprint associated with a project. It does not account for the indirect impacts to Greater Sage-grouse habitats
*** Anticipated debits only reflect projects that are in an advanced state of project planning

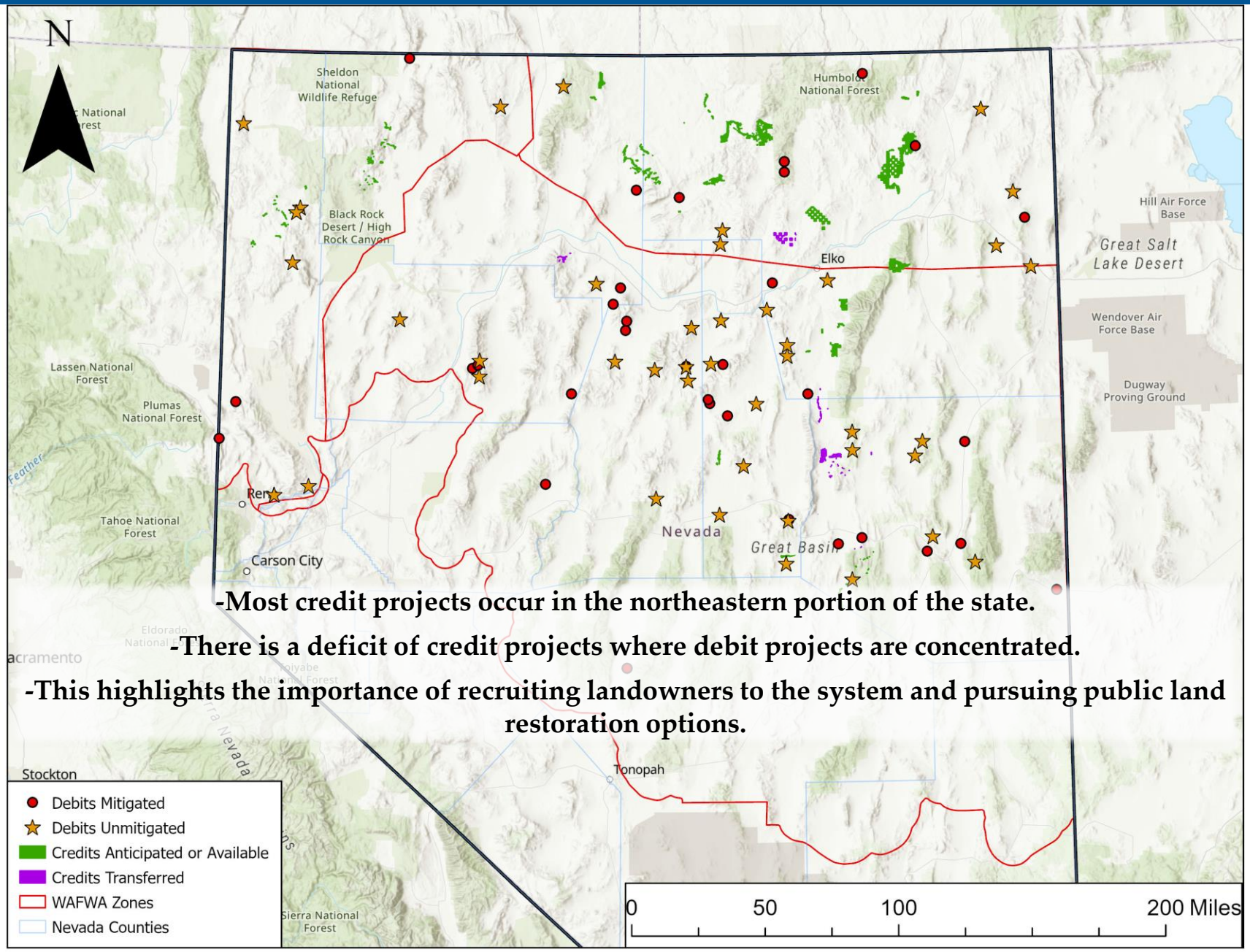
UNMITIGATED DEBITS

PROJECT NAME	DEBITS*	COUNTY	ACRES OF DIRECT IMPACT**	WAFWA MGMT. ZONE
		ANTICIPATED DEBITS***		
Murdock Mountain Phosphate Exploration	2	Elko	15	IV
Green Springs Exploration	62	White Pine	137	III
Whirlwind Exploration	5	Lander	29	III
Hog Mountain Exploration	90	Washoe	187	V
Cove Helen Underground Mine	TBD	Lander	283	III
Crescent Valley Geothermal	1,056	Eureka, Lander	151	III
NW Deeps Mine Expansion	TBD	Eureka, Lander	156	III
Swift Exploration	TBD	Lander	200	III
Northern Nevada Lithium Exploration (Surge)	TBD	Elko	3,221	IV
Wildcat Exploration	TBD	Pershing	194	III
Dodge Flat II Solar Exploration	2	Washoe	9	V
TOTAL	**~2,600**		**4,582**	
ANTICIPATED DEBITS TOTAL	**~34,000**		**31,106**	

- **Several debit projects representing various industries are working toward gathering field data for quantification of debits this spring, with some submissions from previous years now going through the SETT's quality assurance process.**
- **Twelve debit projects have submitted plans to conduct fieldwork or simple desktop assessments for 2024 so far, adding over 45,000 debits to our totals and directly impacting over 38,000 acres.**

* Debits listed are the total of both term and permanent debits
** Direct impact refers to the disturbance footprint associated with a project. It does not account for the indirect impacts to Greater Sage-grouse habitats
*** Anticipated debits only reflect projects that are in an advanced state of project planning

ALL CCS PROJECT LOCATIONS



-Most credit projects occur in the northeastern portion of the state.

-There is a deficit of credit projects where debit projects are concentrated.

-This highlights the importance of recruiting landowners to the system and pursuing public land restoration options.

STATUS OF GREATER SAGE-GROUSE AND THE SAGEBRUSH ECOSYSTEM

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GREATER SAGE-GROUSE POPULATION OVERVIEW

The Nevada Department of Wildlife, in conjunction with federal agency partners including the Bureau of Land Management (BLM), U.S. Forest Service (USFS), U.S. Geological Survey (USGS) and the U.S. Fish and Wildlife Service (USFWS), conducts sage-grouse lek counts and surveys annually. Techniques to monitor leks include traditional ground surveys using accepted protocols and aerial survey using rotary or fixed wing aircraft. Some fixed wing surveys are outfitted with cooled infrared camera technology (thermal imaging) with telephoto capabilities and flown at altitudes that minimize or negate disturbance to birds. Approximately 39% of the 2,320 known sage-grouse leks and approximately 75% of trend leks identified within the state are surveyed each year. Trend leks are a subset of total leks in Nevada that are monitored several times each year to enable a better trend estimate for sage-grouse populations in Nevada.

Table 1. Lek count summary (2002–2023)

Year	No. of Males	Leks Surveyed	Active Leks	AVG/active lek
2002	5,093	652	321	15.9
2003	5,010	402	271	18.5
2004	7,472	505	321	23.3
2005	10,144	760	389	26.1
2006	11,229	737	433	25.9
2007	11,317	947	525	21.6
2008	7,550	786	438	17.2
2009	7,398	860	442	16.7
2010	7,395	751	410	18
2011	8,571	810	438	19.6
2012	9,953	935	523	19
2013	7,394	820	454	16.3
2014	9,063	934	512	17.7
2015	12,551	1,003	606	20.7
2016	13,366	1,048	586	22.8
2017	11,030	954	553	19.9
2018	9,200	973	554	16.6
2019	7,140	854	466	15.3
2020	2,456	422	196	12.5
2021	5,095	1,021	420	12.1
2022	5,597	1,072	427	13.1
2023	5,723	889	396	14.6
2002-2023 AVG.	*8,170*	*824*	*440*	*18.3*

A total of 889 leks were surveyed during 2023, which is approximately 39% of the 2,320 known leks in Nevada. Of the leks surveyed, 396 were considered active (2 or more males). The peak male count for 2023 was 5,723 resulting in an average attendance rate of 14.6 males per active lek and was an 11.5 percent increase over the 2022 attendance rate of 13.1 males per active lek. The 2022 attendance rate represented a lower value during the 2003-2023 period compared to the maximum observed in 2005 (n=26.1). The 2023 attendance rate is still well below (-21 percent) the previous 20-year average of 18.5 males per active lek. The lek count summary from 2003-2023 is provided in Table 1.

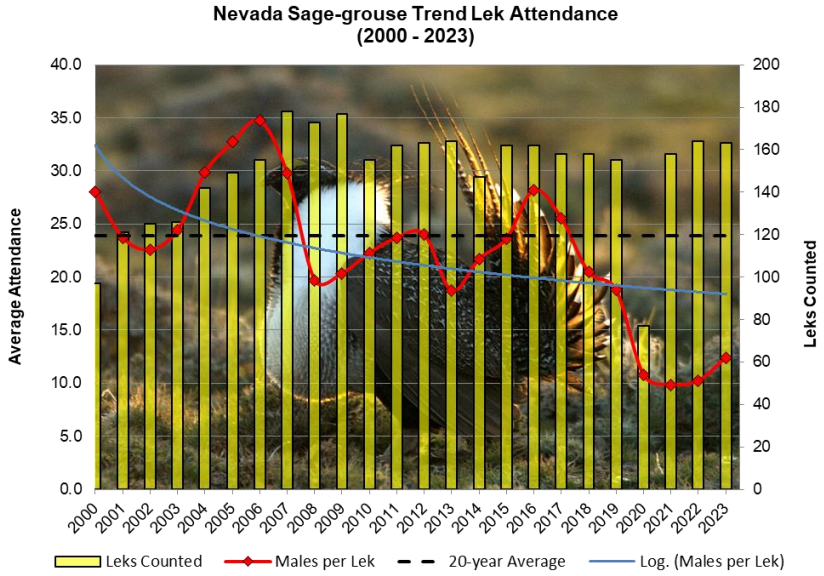


Figure 1. Sage-grouse lek attendance (2000–2023).

Source: Nevada Department of Wildlife, Nevada Sage-grouse Conservation Project Final Performance Report. September 2023

GREATER SAGE-GROUSE POPULATION OVERVIEW

During the 2022 sage-grouse hunting season, 656 wings were collected from various open hunt units across Nevada. The sample size increased by 6.5 percent compared to the previous year's collection of 616 wings; this was the second-fewest number of wings recorded over the 25 years.

Encouragingly, the 2022 season saw an estimated production of 1.65 chicks per hen, a significant 51.4 percent increase from the previous season's average of 1.09 (Table 6). This figure also surpassed the long-term (25-year) average of 1.48 chicks per hen, indicating a positive trend in chick production. Some regional differences in productivity were observed during 2022. Eastern Region (primarily Elko County in northeastern Nevada) chick recruitment was estimated at 1.25 chicks per hen, while Western Region (Humboldt and Washoe County) values were determined to be much higher at 2.07 chicks per hen.

Nest success values were also estimated by examining adult female wings and the molt pattern (progression of replacement through outer primary feathers). Statewide nest success values were estimated at 51.5 percent in 2022 compared to 39.3 percent in 2021. The 2022 nest success value was approximately 7 percent above the long-term (25-year) average of 44.6 percent but still comparable to range-wide averages for the species. From the 211 adult female wings analyzed, 99 nests failed to hatch, and 105 hatched successfully.

Based on the average juvenile recruitment values compiled by decade, sage-grouse productivity has declined. Although recruitment values during the late 1990s and 2000s helped maintain some population sustainability, the productivity values during the last decade are not sufficient to support the population over time (as shown in Figure 2).

Table 2. Wing collection and estimated demographic metrics over the last decade in Nevada.

Year	Total Wings Collected	Chick per Hen	Nest Success
2013	855	1.67	45.7%
2014	1034	1.54	47.1%
2015	1667	1.52	39.6%
2016	1541	1.56	36.5%
2017	1278	0.98	46.5%
2018	1138	0.89	43.0%
2019	833	1.14	36.9%
2020	1262	1.22	56.3%
2021	616	1.09	39.3%
2022	656	1.65	51.5%
10-Year Avg	1088	1.33	44.2%

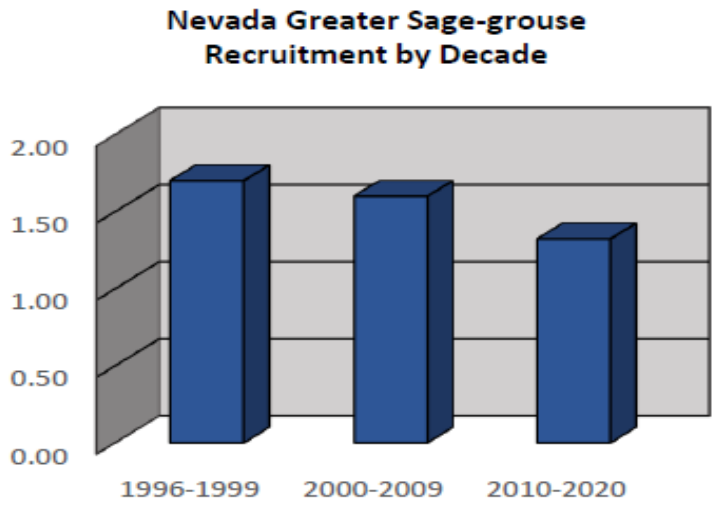


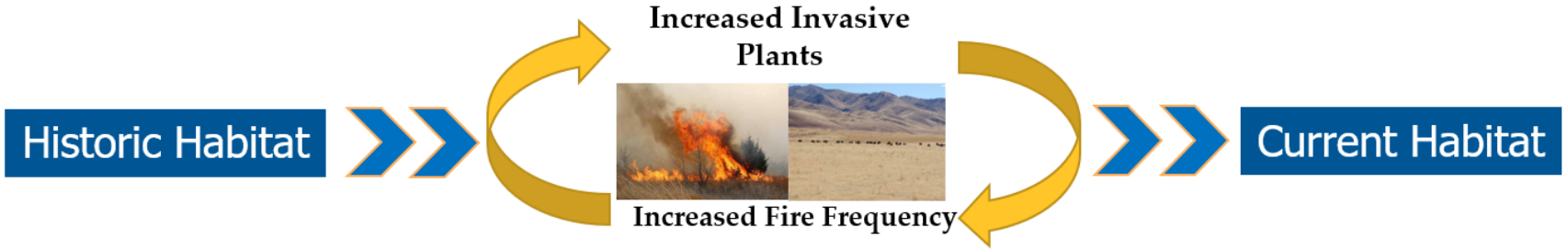
Figure 2. Average recruitment of sage-grouse juveniles in Nevada per decade.

Source: Justin Small, Nevada Department of Wildlife, Statewide Summaries for Upland Game Species 2022-2023. September 2023.

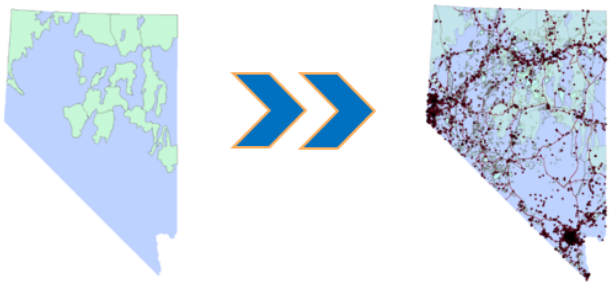
THREATS TO GREATER SAGE-GROUSE

THREATS TO THE SAGEBRUSH ECOSYSTEM AND THE GREATER SAGE-GROUSE

Threats to the greater sage-grouse are numerous but can be placed into several categories that all affect the grouse's habitat. Direct habitat loss from wildfire and invasive species and habitat fragmentation are the greatest contributing factors to the declining grouse population.



ANTHROPOGENIC FRAGMENTATION



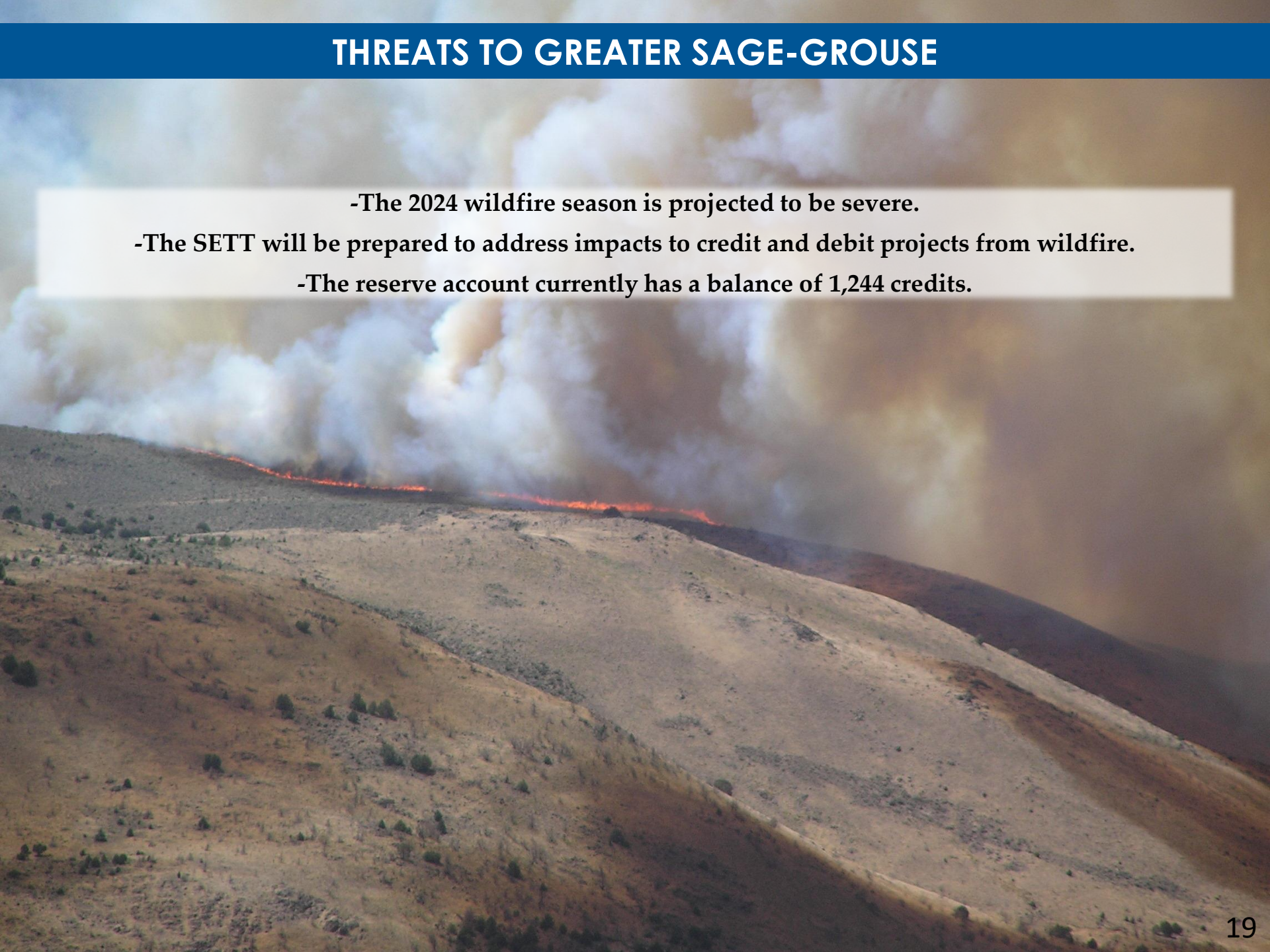
OTHER INFLUENCES

- Pinyon Juniper encroachment
- Wild Horse and Burro impacts
- Predation
- Recreation and OHV use
- Improper livestock management

FIGURE 4: Threats to Sagebrush Ecosystems.

Wildfire, cheatgrass invasion, and landscape fragmentation will continue to degrade the sagebrush ecosystem. Proactive measures to prevent catastrophic wildfires, post-fire restoration activities, and the avoid-minimize-mitigate hierarchy will become even more important for reducing threats to Nevada's sagebrush ecosystem and greater sage-grouse habitat.

THREATS TO GREATER SAGE-GROUSE



-The 2024 wildfire season is projected to be severe.

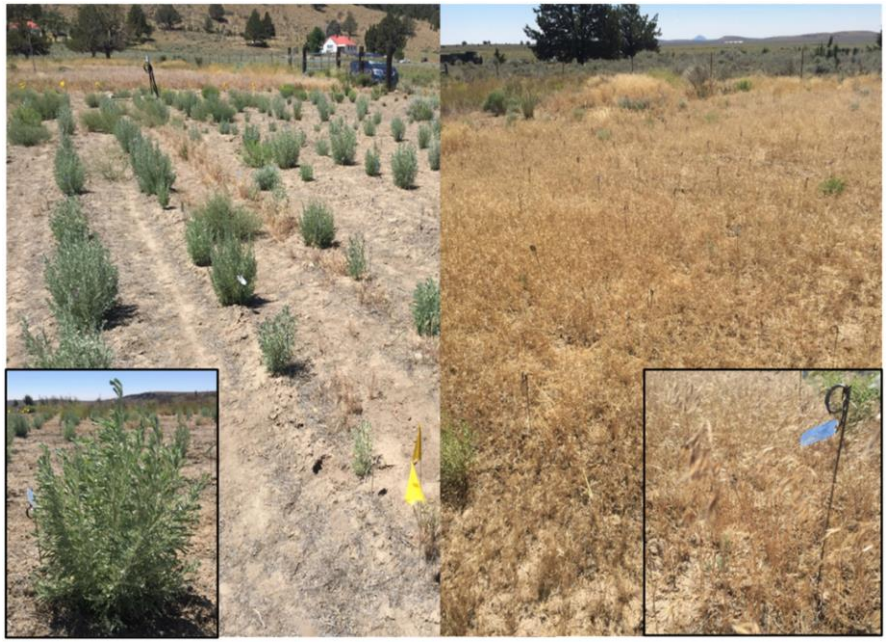
-The SETT will be prepared to address impacts to credit and debit projects from wildfire.

-The reserve account currently has a balance of 1,244 credits.

NEW RESEARCH - GRSG HABITAT IMPROVEMENTS AND IMPACTS

Wyoming Big Sagebrush Transplant Survival and Growth Affected by Age, Season of Planting, and Competition.

This study adds to the increase in the need to restore sagebrush and contributes to improving the success of sagebrush transplanting. Sagebrush seedlings have lower success rates than transplanting due to seedling mortality from harsh weather conditions. This study examined how sagebrush transplant survival and size are impacted by age at the time of planting, planting season, and invasive annual grass competition. This study is the first to indicate that sagebrush transplants may not need to be grown for an extended period, only 10-12 weeks before being transplanted. Spring planting had higher survival rates compared to fall planting. Invasive annual grasses reduce transplant survival and canopy cover; therefore, controlling for invasive annual grasses before planting is vital.



Side-by-side comparison of the reduced competition location (left) and competition location (right) taken in summer 2020.

Holfus, Corinna M., Chad S. Boyd, Roxanne C. Rios, Kirk W. Davies, Stella M. Copeland, and Ricardo Mata-González. "Wyoming Big Sagebrush Transplant Survival and Growth Affected by Age, Season of Planting, and Competition." Rangeland Ecology & Management 92 (2024): 1-11.

NEW RESEARCH - GRSG HABITAT IMPROVEMENTS AND IMPACTS

Restoration of wet meadows to enhance Gunnison sage-grouse habitat and drought resilience in arid rangelands

Wet meadows in the sagebrush ecosystem make up less than 2% of the landscape and are critical for wildlife and livestock. This study aimed to enhance wet meadow drought resiliency by slowing water down, reconnecting floodplains, and increasing wetland vegetation, indirectly enhancing Gunnison sage-grouse habitat and improving rangeland conditions. The authors constructed about 900 low-tech restoration structures between 2012 and 2020. Six of the years were considered drought years. They found that 75% of ephemeral and all perennial units achieved or surpassed the wetland plant cover management goal of a 4% yearly increase. This led to an average enhancement of 40% in wetland plant cover in the treated drainageways. During a megadrought, the low-tech restoration structures effectively rewetted perennial and ephemeral wet meadows within the arid landscape. They reduced non-native invasive weeds in all but one treated unit. Forbs and grasses critical to sage-grouse and important to livestock increased in 67% of the units.

Rondeau, Renée J., Gay Austin, Rachel S. Miller, Suzann Parker, Andrew Breibart, Shawn Conner, Elizabeth Neely, Nathan W. Seward, Matthew G. Vasquez, and William D. Zeedyk. "Restoration of wet meadows to enhance Gunnison sage-grouse habitat and drought resilience in arid rangelands." Restoration Ecology 32, no. 2 (2024): e14039.

NEW RESEARCH - GRSG HABITAT IMPROVEMENTS AND IMPACTS

Geothermal energy production adversely affects a sensitive indicator species within sagebrush ecosystems in western North America

This study provides crucial insights into the effects of geothermal energy production on greater sage-grouse populations. The research, conducted at two geothermal sites in Nevada, estimated absence rates of male sage-grouse from lek sites and changes in predicted apparent abundance and demographic rates. The findings were significant, with a 34% decline within 5 km of geothermal and a staggering 730% increase in lek absence rates within 2 km. The study also revealed decreases in adult and nest survival, and an increase in common raven density, all of which were immediate impacts of geothermal energy development. Importantly, the authors identified areas for future geothermal development that could minimize adverse effects on wildlife populations.

Image source: Public domain. Steamboat Hills and Galena II geothermal power plant, Nevada.

Coates, Peter S., Brian G. Prochazka, Shawn T. O'Neil, Sarah C. Webster, Shawn Espinosa, Mark A. Ricca, Steven R. Mathews, Michael Casazza, and David J. Delehanty. "Geothermal energy production adversely affects a sensitive indicator species within sagebrush ecosystems in western North America." Biological Conservation 280 (2023): 109889.

2024 SAGEBRUSH ECOSYSTEM TECHNICAL TEAM ACTIVITIES

2024 SAGEBRUSH ECOSYSTEM TECHNICAL TEAM ACTIVITIES

- The SETT welcomed one new member to the team in January: Skyler Monaghan (NDA); Plan to welcome new NDF member in late May or early June.
- The SETT attended the Society for Range Management's annual meeting in Reno and co-hosted a booth with the Nevada Conservation Districts Program at the trade show.
- The 9th Annual CCS Certified Verifier Training was held by the SETT in January of 2024. Seventy-four consultants attended, and 59 were certified.
- The SETT visited one credit project in 2024 as part of the Five-Year Qualitative Assessments and will visit one more once waters recede and access is possible in June. They will also assist credit producers in planning conservation treatments and will meet with future credit producers.
- The SETT has been working to improve the program through enhancing the clarity and accessibility of program documents and processes.

SRM Booth

Verifier Training

Humboldt Ranch – Hot Lake

2024 SAGEBRUSH ECOSYSTEM TECHNICAL TEAM ACTIVITIES

Other efforts of the Sagebrush Ecosystem Technical Team through May of 2024 included:

- Held three Sagebrush Ecosystem Council Meetings.
- Conducted efforts related to managing subgrants to USGS and Environmental Incentives.
- Continued working on Sagebrush Ecosystem Program Strategic Action Plan update.
- Continued collaboration with federal and state agencies to enhance planning and conservation efforts.
- Served as cooperating agency in various stages of more than 15 NEPA processes for large-scale disturbances.
- Took part in various meetings related to Greater Sage-Grouse, wildfire, conservation efforts and tracking, mining, restoration, etc.
- Worked with the Nevada Creeks and Communities Team to put together and implement Riparian Proper Functioning Condition (PFC) workshops. Several new SETT members attended the May 2024 workshop.
- Assisted NDOW with several sage-grouse lek surveys

Views of the East IL Ranch (SETT): Sagebrush seedling recruitment (left); Lupinus (right).

PLANS FOR THE FUTURE

- Assist in the annual Nevada Youth Range Camp in June, teaching plant identification to high-schoolers.
- Attend a field tour hosted by one of our debit project proponents in June to view results of reclamation activities.
- Attend a field tour hosted by the Shoesole Resource Management Group in NE Nevada in June.
- Continue to implement the CCS and the avoid-minimize-mitigate hierarchy.
- Continue to work with credit & debit project proponents to help navigate the system and maintain productive relationships.
- Train & assist verifiers in assessing debit project impacts and credit project conservation values.
- Ensure credit projects that were awarded State seed-funding continue moving forward with ecosystem improvements & management planning.
- Participate in meetings with BLM, USFS, USFWS and NDOW staff to foster greater awareness of the CCS, its legal requirement, and its implementation.
- Continue updating the SEP Strategic Action Plan.
- Take part in land management agency plan amendments.
- Aim to restart, streamline, and better implement the adaptive management process now defined in the Nevada Greater Sage-Grouse Conservation Plan, BLM, and USFS plans.
- Coordinate with other western states to establish an annual meeting to share knowledge on sagebrush ecosystem conservation and Greater Sage-Grouse mitigation.
- Continue to integrate new science/tools into the CCS to achieve more effective mitigation for the Greater Sage-Grouse and its habitats.

Olsynium douglasii (SETT)

The Sagebrush Ecosystem Program is grateful for the agency partnerships and support that is critical for program implementation and long-term success of the CCS.