

18. Predation					
ISSUE 18.1	Public misunderstanding of the role of predation in GrSG populations can make GrSG predation management challenging.				
OBJECTIVE 18.1.1	Improve the public's understanding of the role of predation on GrSG populations.				
Reference Number	Conservation Strategy	Responsible Parties	Timeline	Implementation	Effectiveness
18.1.1.1	Actively provide accurate information to the general public and stakeholders to improve their understanding about the relationship between predation and GrSG. [See Information, Communication, and Education Strategies 12.2.1.3 and 12.3.1.1]	CPW	2009- Annually beginning in 2008	CPW: General - CPW provides information to interested publics through a variety of formal and informal methods. The effect of predation on GrSG is a regular part of this communication and seeks to differentiate between the fact of predation (that it occurs in all populations) from the effect of predation (if and where it constitutes an unnatural/unsustainable cause of excess mortality).	
ISSUE 18.2	Information is lacking on the role of predation on GrSG populations.				
OBJECTIVE 18.2.1	Conduct research and monitoring to investigate the role of predation on GrSG populations in Colorado.				
Reference Number	Conservation Strategy	Responsible Parties	Timeline	Implementation	Effectiveness
18.2.1.1	Conduct a thorough review of the existing literature on the relationship between predation and GrSG populations and habitat. [See Research Strategy 21.4.1.1]	APHIS, BLM, CDA, CPW, LWGs, USFS, USFWS, USGS	Begin by 2010	See 21.4.1.1	
18.2.1.2	Establish a process to develop GrSG predation research priorities within Colorado, and encourage innovative and progressive research questions. [See Research Strategy 21.4.1.1]	APHIS, BLM, CDA, CPW, LWGs, USFS, USFWS, USGS	Begin by 2010	See 21.4.1.1	
18.2.1.3	Document and monitor current predator population levels in GrSG habitat. [See Research Strategy 21.4.1.1]	APHIS, BLM, CDA, CPW, LWGs, USFS, USFWS, USGS	Begin by 2010	See 21.4.1.1	
18.2.1.4	Evaluate relationships among GrSG predator species, including how GrSG predator species population levels change relative to each other. [See Research Strategy 21.4.1.2]	APHIS, BLM, CDA, CPW, Universities, USFWS, USGS	Begin by 2015		
18.2.1.5	Investigate and evaluate the natural variability in GrSG predator populations. [See Research Strategy 21.4.1.2]	APHIS, BLM, CDA, CPW, Universities, USFWS, USGS	Begin by 2015		

Reference Number	Conservation Strategy	Responsible Parties	Timeline	Implementation	Effectiveness
18.2.1.6	Investigate the effects of predation on all GrSG life stages. [See Research Strategy 21.4.1.1]	APHIS, BLM, CDA, CPW, LWGs, USFS, USFWS, USGS	Begin by 2010	See 21.4.1.1 CPW: General - While CPW has not conducted specific research to experimentally test the effect of predation on GrSG life stages, CPW has maintained hundreds of radio-marked GrSG (male, female, adults and chicks) over many years in NWCO, NP, NESR, MWR, and PPR. At no time, and in no population, have demographic rates been detected that differ markedly from expected levels found elsewhere in the range of GrSG.	CPW: At a coarse level, this evidence is strong indication that excessive predation of GrSG is not occurring in Colorado.
18.2.1.7	Investigate the influence of GrSG habitat on predation rates. [See Research Strategy 21.4.1.3]	APHIS, BLM, CDA, CPW, Universities, USFWS, USGS	Begin by 2015	See 21.4.1.3	
18.2.1.8	Investigate how predation rates on GrSG are influenced by the natural temporal and spatial variability in sagebrush ecosystems (e.g., plant age class, fire intervals). [See Research Strategy 21.4.1.3]	APHIS, BLM, CDA, CPW, Universities, USFWS, USGS	Begin by 2015	See 21.4.1.3	
18.2.1.9	Investigate the quantity of habitat (i.e., patch size) needed to sustain GrSG. [See Research Strategies 21.1.1.1 and 21.4.1.3]	APHIS, BLM, CDA, CPW, Universities, USFWS, USGS	Begin by 2010 / Begin by 2015	See 21.1.1.1 and 21.4.1.3	
18.2.1.10	Investigate how invasive weed species impact predation rates on GrSG. [See Research Strategy 21.4.1.3]	APHIS, BLM, CDA, CPW, Universities, USFWS, USGS	Begin by 2015	See 21.4.1.3	
18.2.1.11	Investigate the influence of habitat quality (e.g., nutrition, forb/insect quality and quantity) on GrSG chick vulnerability to predation. [See Research Strategies 21.1.1.1 and 21.1.1.3]	APHIS, BLM, CDA, CPW, CSU Extension, Industry, LWGs, NRCS, Private Landowners, USFS, USFWS, USGS	Begin by 2010 /2012	See 21.1.1.1	
18.2.1.12	Evaluate the impact of infrastructure, powerlines, roads, and fences on predation rates in GrSG populations. [See Research Strategy 21.4.1.3]	APHIS, BLM, CDA, CPW, Universities, USFWS, USGS	Begin by 2015	See 21.4.1.3	
18.2.1.13	Investigate the roles of and relationships between native and non-native predators in the sagebrush ecosystem. [See Research Strategy 21.4.1.2]	APHIS, BLM, CPW, Universities, USFWS, USGS	Begin by 2015		

Reference Number	Conservation Strategy	Responsible Parties	Timeline	Implementation	Effectiveness
18.2.1.14	Evaluate whether vegetation treatments improve GrSG habitat in a way that affects GrSG population parameters, such as nest success. [See Research Strategy 21.1.2.1]	BLM, CDA, CPW, LWGs, NRCS, Private Landowners, UCEPC, USFS, USFWS, USGS	Begin by 2015		
ISSUE 18.2 Information is lacking on the role of predation on GrSG populations.					
OBJECTIVE 18.2.2 Secure funding for research on predation and GrSG populations.					
Reference Number	Conservation Strategy	Responsible Parties	Timeline	Implementation	Effectiveness
18.2.2.1	Identify funding sources for research on predation and GrSG. [See Research Strategy 21.4.1.1]	APHIS, BLM, CPW, LWGs, USFS, USFWS, USGS	Begin by 2010	See 21.4.1.1	
18.2.2.2	Secure funding for research on predation and GrSG. [See Research Strategy 21.4.1.1]	APHIS, BLM, CPW, LWGs, USFS, USFWS, USGS	Begin by 2010	See 21.4.1.1	
ISSUE 18.3 Although predation has always occurred in GrSG populations, increases in numbers or types of specific predators may affect sage-grouse population numbers.					
OBJECTIVE 18.3.1 Encourage timely, innovative GrSG predation management strategies (including adaptive predator management and monitoring), to assist in achieving GrSG population targets (see "Colorado GrSG Population Management Zones", pg. 248).					
Reference Number	Conservation Strategy	Responsible Parties	Timeline	Implementation	Effectiveness
18.3.1.1	Identify appropriate types of predator control for GrSG populations and coordinate potential actions locally and regionally.	APHIS, CDA, CPW, LWGs	2008	CPW: CPW has maintained hundreds of radio-marked GrSG (male, female, adults and chicks) over many years in NWCO, NP, NESR, MWR, and PPR. At no time, and in no population, have demographic rates been detected that differ markedly from expected levels found elsewhere in the range of GrSG. At a coarse level, this is strong indication that excessive predation of GrSG is not occurring in Colorado. Per the CCP, active predator control will only be considered in areas where documented excessive predation is occurring. However, other types of management actions to deter predators (e.g., perch preventers, removal of piñon-juniper trees, etc) are being implemented and are detailed in other chapters (e.g., Infrastructure and Piñon-Juniper Encroachment).	

Reference Number	Conservation Strategy	Responsible Parties	Timeline	Implementation	Effectiveness
18.3.1.2	Implement GrSG predator control, as necessary and appropriate and coordinate activities locally and regionally.	APHIS, BLM, CPW, County Governments, LWGs,	2009	See 18.3.1.1.	
18.3.1.3	When applying predation management techniques, abide by existing laws, including: <ul style="list-style-type: none"> • Colorado Amendment 14 • Bald and Golden Eagle Protection Act • Migratory Bird Treaty Act 	APHIS, CPW, USFWS	As Needed		
18.3.1.4	Design an effective and consistent monitoring program to determine if predation management actions are achieving desired results in GrSG populations.	CPW	ASAP		
18.3.1.5	Work with implementing parties to ensure that GrSG predation management monitoring results are reported.	CPW	As Needed		
18.3.1.6	Establish an annual meeting to coordinate reporting of LWG progress towards implementation of predation management strategies (in both local and statewide conservation plans), and to encourage communication among LWGs regarding predation management. [See Information, Communication, and Education Strategy 12.3.2.1]	CPW	2008 and ongoing		
18.3.1.7	Encourage and allow risk-taking (e.g., experimental predator control in limited areas) so that implementers and collaborators have the flexibility to conduct adaptive GrSG predation management.	CPW	Ongoing		
18.3.1.8	Report predation management strategy results to GrSG steering committee.	LWGs	Annually		
18.3.1.9	Educate interested publics regarding which management actions are most biologically and cost-effective in increasing reproductive success in GrSG populations. [See Information, Communication, and Education Strategy 12.3.1.1]	CPW	Annually beginning in 2008		
ISSUE 18.4 Funding is needed to support predation strategies (in both local plan and statewide GrSG conservation plans).					
OBJECTIVE 18.4.1 Identify and secure the funding needed to implement predation strategies (in both local plan and statewide GrSG conservation plans).					
Reference Number	Conservation Strategy	Responsible Parties	Timeline	Implementation	Effectiveness
18.4.1.1	Identify potential funding sources for predation management strategies.	CPW	2008		

Reference Number	Conservation Strategy	Responsible Parties	Timeline	Implementation	Effectiveness
18.4.1.2	Secure funding for predation management strategies.	BLM, CPW, Industry, LWGs, Private Landowners, NRCS, USFS, USFWS	2008		
18.4.1.3	Develop a process to allocate funding for LWG predation strategies.	CPW	2008		
18.4.1.4	LWGs identify local plan funding needs and submit proposals within funding process framework (see strategy 18.4.1.3).	LWGs	2008 and annually		
ISSUE 18.5	Special consideration regarding the implementation of predator management may be required in small isolated GrSG populations.				
OBJECTIVE 18.5.1	Protect GrSG small populations from excessive predation when populations (3-year average) fall to either of 2 "trigger" levels: (1) below 25 birds in the spring breeding population; or (2) to 25% of the long-term average goal for the population.				
Reference Number	Conservation Strategy	Responsible Parties	Timeline	Implementation	Effectiveness
18.5.1.1	Identify relevant predator species within local GrSG populations that meet the established trigger(s).	BLM, CPW, LWGs, Other Research Institutions, Universities, USFS, USFWS	2009	See 18.3.1.1.	
18.5.1.2	Determine age-specific mortality and identify relative risks from avian and mammalian predation within local GrSG populations meeting the described trigger(s).	BLM, CPW, LWGs, Other Research Institutions, Universities, USFS, USFWS	2009	See 18.3.1.1.	
18.5.1.3	Evaluate whether predator management aimed at a specific predator species is an effective management tool that increases production and recruitment of sage-grouse in local populations that meet the established trigger(s).	BLM, CPW, LWGs, Other Research Institutions, Universities, USFS, USFWS	2009	CPW: CPW has recently tested the effectiveness of predator control in improving recruitment in a small population of Gunnison sage-grouse.	CPW: Evaluation of the effectiveness of this project will be completed in 2013. The results of this project may shed light on the effectiveness of predator control in small GrSG populations as well.
18.5.1.4	If predator control is likely to be effective, then develop and implement predator management strategies designed for specific GrSG population that is in accordance with CPW and federal regulations and policies.	BLM, CPW, LWGs, Other Research Institutions, Universities, USFS, USFWS	2009	CPW: Predator management strategies (beyond perch preventers, removal of piñon-juniper trees, etc.) is not needed at this time.	