McNary Dam Green Laser Bird Dissuasion Evaluation 2019

## Goal

To evaluate effectiveness for green laser to reduce avian feeding behavior at the Juvenile Fish Facility outfall at McNary Dam

## **Methods**

Compare numbers of birds present at and near the Juvenile Fish Facility Outfall (JFFOF) with the green laser on and off. The focus will be on two periods of typical peak bird counts, 15 April - 15 May and 15 June - 15 July (see 2015-2018 bird counts below). The laser will be operated in blocks of three days with the laser on for two days and off one day. The off day will be selected at random within each block (Table 1).

Data collected will be numbers of birds of each species counted in each of four zones; JFFOF, Powerhouse tailrace, spillway tailrace and forebay. Observers will also record the laser condition (on/off) and weather condition (sunny, partly cloudy, overcast and low visibility) as well as the normal variable of date, time and location (see datasheet below) and if hazing was occurring at time of counts. This model will provide approximately 20 replicate blocks with the four response variable (mean bird counts per day per zone), one fixed variable (laser condition) and two covariates (time and weather). We will use multivariate randomized block ANOVA and univariate ANOVA's by location if a significant outcome is found. We will also run some exploratory regression analyses to look for effects from environmental conditions (weather, light, flow, spill, etc.) and amount of use (i.e. habituation) on laser effectiveness.

## <u>Caveats</u>

As this is a new application, some adaptive management will likely be needed in how the laser is used and evaluated. A result of no effect may indicate green lasers are not effective at deterring avian feeding behavior or that we are not using it correctly. Some of the evaluation will also be our subjective observations on how birds reacted to the laser.

If in the course of the study it is obvious that the laser is effective at disrupting feeding behavior of birds at the outfall, the project reserves to the option to discontinue the evaluation in preference of reducing predation on ESA-listed fish.

						Piscivor	ous Bird	Count I	Data Sh	eet			
Project: Date:							Observer (First & Last name)						
me Laser Gull Cormorant					Caspian Tern		Grebes		Pelicans			Notes: other birds.	
Zone	Y/N F	NF	F	NF	F	NF	F	NF	F	NF	Weather	Hazing methods: boat, lethal, etc.	
SWT1													
PHT1													
JFOF													
FB1													
Abbi	reviatio	ns from I	birdpop.o	rg/alphac	odes.htm								
GULL - all species				COME - common merganser			Weather						
DCCO - double-crested cormorants				OSPR - osprey			LV - ILow visibility (fog, heavy rain, etc.)						
CATE - Caspian terns													
GREBE- all species					BAEA - baid eagle								
	SWT1 PHT1 JFOF FB1 Zone maj werhouse Abbi species ouble-cresispian term II species	Laser Zone Y/N SWT1  PHT1  JFOF  FB1  Zone map for Mc werhouse SWT1=  Abbreviation species puble-crested corm uspian terms Il species	Laser C Zone Y/N F SWT1  PHT1  JFOF	Laser Gull  Zone Y/N F NF  SWT1  PHT1  JFOF  FB1  Zone map for McNary's project's cocwerhouse SWT1=Spillway, JFOF=out  Abbreviations from birdpop.os species puble-crested cormorants uspain terms Il species	F = foraging NF = nonforag  Laser Gull Corm  Zone Y/N F NF F  SWT1  PHT1  JFOF  JFOF  Zone map for McNary's project's codes location werhouse SWT1=Spillway, JFOF=outfall, FB1:  Abbreviations from birdpop.org/alphac species  species	Date:	Date:	Date:	Date: Day of Week:   F = foraging	Date:	Laser   Gull   Cormorant   Caspian Tern   Grebes   Pelis     Zone   Y/N   F   NF   F   NF   F   NF   F   NF   F     SWT1	Date:	Date: Day of Week:

Table 1. Laser treatment blocks.

Block   Date   Laser   Block   Date   Laser   1   15-Apr   Off   11   15-Jun   On   16-Apr   On   17-Jun   Off   17-Apr   On   17-Jun   Off   19-Jun   Off   20-Apr   On   20-Jun   On   22-Jun   On   22-Apr   On   23-Jun   Off   23-Jun   Off   24-Apr   On   25-Apr   On   26-Jun   Off   25-Jun   On   26-Apr   On   26-Jun   Off   29-Apr   Off   29-Jun   On   28-Jun   Off   29-Apr   Off   29-Jun   On   1-May   Off   2-Jul   On   4-May   Off   4-Jul   Off   5-May   On   18   6-Jul   On   7-May   On   19   9-Jul   On   10-May   Off   11-Jul   Off   11-May   Off   11-Jul   Off   11-May   Off   11-Jul   Off   11-May   Off   11-Jul   Off   11-May   Off   11-Jul   Off   11-Jul   Off   11-May   Off   11-Jul   On   11-					oony ounny a	o cicar ony
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## McNary Dam 2015 bird counts.







