

# Prioritizing ANS Funding



A SCIENCE BASED DATA DRIVEN APPROACH TO RISK

## Risk of Introduction

What is the likelihood that mussels will be introduced via watercraft?



## Risk of Establishment

Part 1: What is the likelihood that if introduced, mussels can build shells and survive?



## Risk of Establishment

Part 2: What is the likelihood that mussels can grow, reproduce, and establish an invasive population?



## Risk of Introduction by Recreational Watercraft

- Primary ranking factor for priority waters.
- Based on boater demographics and more than 1M data points collected at watercraft inspection and decontamination (WID) stations from 2012–2015.
- Five data factors compared among waters with WID stations:
  - Total Incoming Inspections or Total Volume of Boats
  - Boat Origin
    - Local In-State Boat
    - Non-Local In-State Boat
    - Out of State Boat
  - Watercraft Risk Type
  - Number of Boats That Have Been Out of State in the Last 30 Days
  - Last Launch in a Colorado Positive or Suspect Water

## Risk of Establishment

- Secondary ranking factor for priority waters.
- Based on ~281,000 water quality data points collected by the ANS Program's sampling and monitoring crews from 2013–2016.
- All waters examined are within suitable habitat ranges despite some being ranked lower than others:

### Part 1:

- Primary factor necessary for shell formation and animal viability.
- Represents what a zebra or quagga mussel would need to survive if introduced
- CHALK variables = Calcium, Hardness, Alkalinity, pH

### Part 2:

- Secondary factor necessary for long term population survival
- Represents what a zebra or quagga mussel would need to survive, reproduce and establish an invasive population.
- Based on three factors:
  - Chlorophyll
  - Total Phosphorus
  - Total Nitrogen

# CPW Zebra and Quagga Mussel Risk Assessment Summary

## 2016 REVISION UPDATE

Ranked by Risk of Introduction Score First, and Risk of Establishment (Habitat) Score Second.

WID Site Location	Region	<sup>2</sup> INTRODUCTION RANK	<sup>1</sup> HABITAT RANK
PUEBLO - QM* #	SE	VERY HIGH	VERY HIGH
BOYD LAKE	NE	VERY HIGH	VERY HIGH
CHATFIELD*	NE	VERY HIGH	VERY HIGH
CHERRY CREEK*	NE	VERY HIGH	VERY HIGH
NAVAJO*	SW	VERY HIGH	HIGH
BLUE MESA RESERVOIR* #	SW	VERY HIGH	HIGH
HORSETOOTH LAKE*	NE	VERY HIGH	MEDIUM
CARTER LAKE*	NE	VERY HIGH	MEDIUM
CBT - GRAND, GRANBY*, SHADOW MOUNTAIN* #	NW	VERY HIGH	LOW
ELEVEN MILE*	NE	HIGH	VERY HIGH
JACKSON LAKE*	NE	HIGH	VERY HIGH
MCPHEE RESERVOIR	SW	HIGH	VERY HIGH
NORTH STERLING*	NE	HIGH	VERY HIGH
HIGHLINE LAKE*	NW	HIGH	VERY HIGH
RIDGWAY*	SW	HIGH	VERY HIGH
SPINNEY MOUNTAIN*	NE	HIGH	VERY HIGH
JOHN MARTIN	SE	MEDIUM	VERY HIGH
RIFLE GAP	NW	MEDIUM	VERY HIGH
STAGECOACH	NW	MEDIUM	VERY HIGH
TRINIDAD	SE	MEDIUM	VERY HIGH
JUMBO RESERVOIR #	NE	MEDIUM	VERY HIGH
ANTERO RESERVOIR	NE	MEDIUM	VERY HIGH
LATHROP*	SE	MEDIUM	VERY HIGH
GREEN MOUNTAIN RESERVOIR	NW	MEDIUM	HIGH
ELKHEAD	NW	MEDIUM	HIGH
RUEDI RESERVOIR	NW	MEDIUM	HIGH
TAYLOR PARK RESERVOIR*	SW	MEDIUM	MEDIUM
VALLECITO*	SW	MEDIUM	MEDIUM
CRAWFORD*	SW	LOW	VERY HIGH
VEGA	NW	LOW	HIGH
SWEITZER	SW	LOW	HIGH
STEAMBOAT LAKE	NW	LOW	MEDIUM
CLEAR CREEK RESERVOIR	SE	VERY LOW	MEDIUM
HARVEY GAP	NW	VERY LOW	VERY HIGH
BARR LAKE	NE	VERY LOW	HIGH
TARRYALL RESERVOIR #	NE	VERY LOW	HIGH
MANCOS	SW	VERY LOW	HIGH
PAONIA	SW	VERY LOW	HIGH
WILLIAMS FORK RESERVOIR*	NW	VERY LOW	LOW

<sup>1</sup> Analysis performed by CPW on 2013–2016 data collected by CPW ANS Sampling Crews

<sup>2</sup> Analysis performed in 2016 based on 2012–2015 average WID data

\* indicates a water body that has intercepted one or more infested mussel boats in the past.

# indicates a water body which has had a prior detection and has been de-listed for mussels.

COLORADO PARKS AND WILDLIFE ANS PROGRAM, ELIZABETH BROWN & ROBERT WALTERS, JANUARY 12, 2017

