

Implementation Update of EPA (2013) Ammonia Criteria



UTAH DEPARTMENT of
ENVIRONMENTAL QUALITY

**WATER
QUALITY**

Water Quality Standards Workgroup 02/22/21

Presentation Overview

1. 2013 Ammonia Implementation Progress

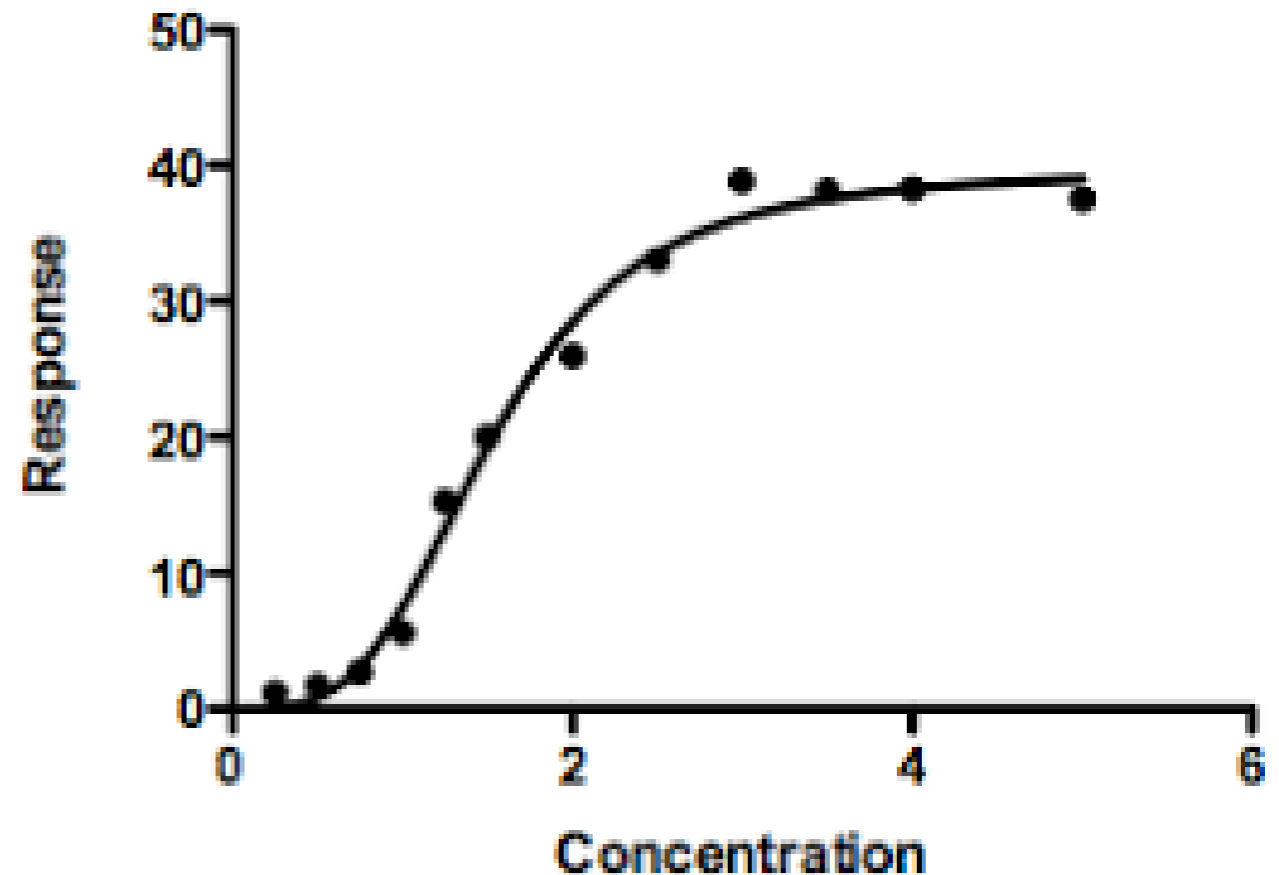
- Known Utah unionid locations
 - Physical Surveys
 - eDNA

2. New unionid toxicity data

- California Recalculation Procedure, aka Species-Deletion Procedure

3. Recalculation Procedure: 2013 EPA Ammonia Criteria examples

- EPA ammonia examples
- CVCWA
- Utah



Progress

Historical records tabulated 2017

- Two Utah unionid species identified
- Next step from [2017 Utah Implementation Guidance](#): site-specific surveys for POTW receiving waters
 - Physical surveys
 - eDNA

POTW initiated physical surveys 2017-2020

- Unionid-absent criteria adopted for Jordan River segment 2019
- Survey data gaps identified 2020
- Recommend ammonia criteria for the rest of Jordan River

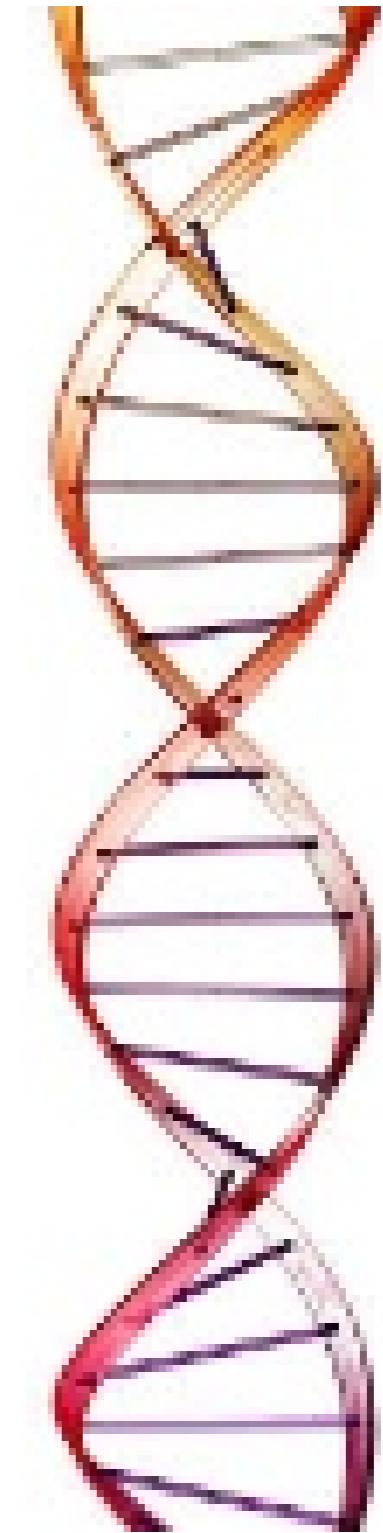
eDNA

Laboratory and field protocols established Torrey Rodgers *et al.* (2020) for UDWR

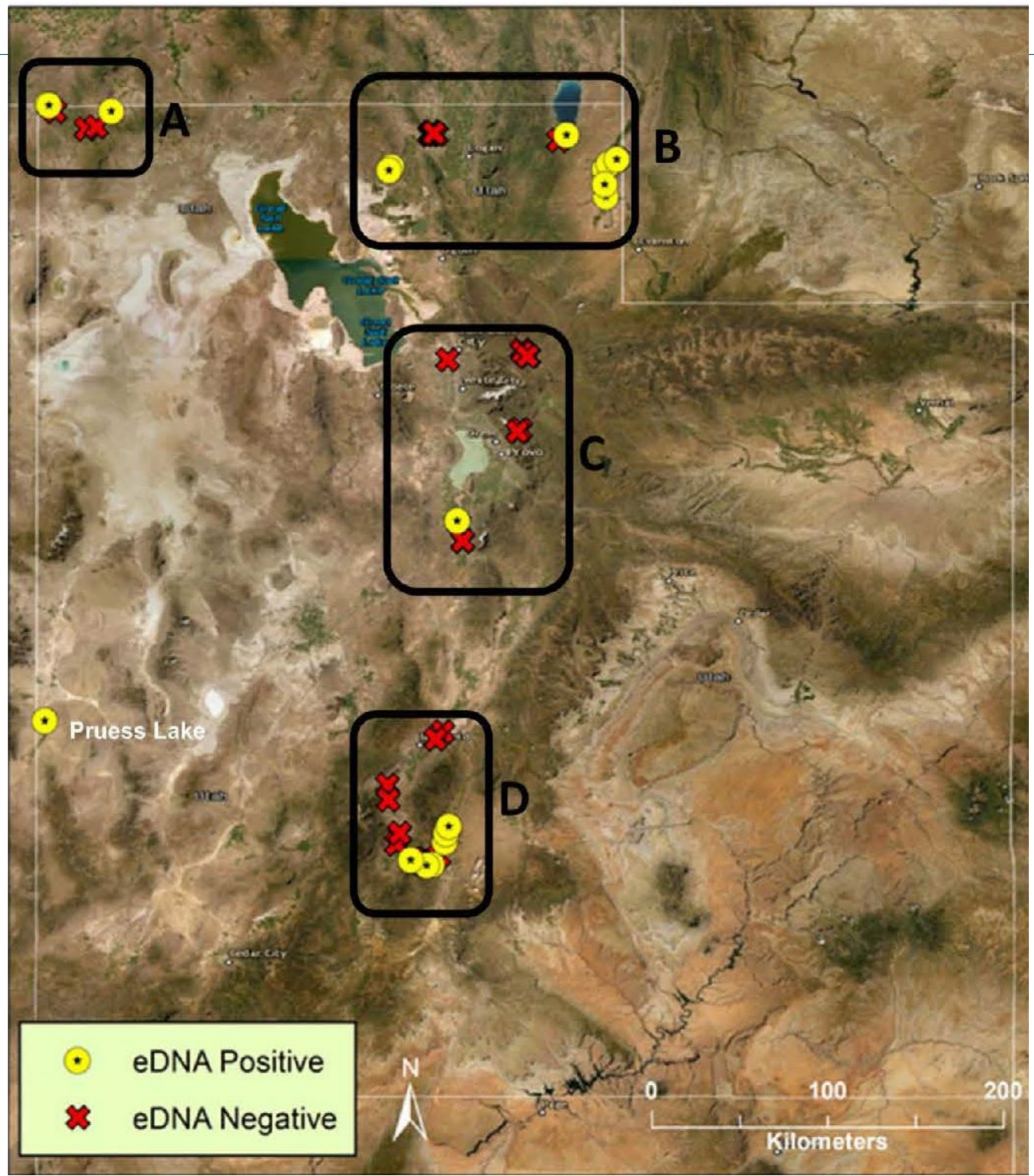
- DNA Primers for *Gonidea angulata*, *Margaritifera falcata*, *Anodonta nuttalliana* and *Anodonta oregonensis*

Standardized field and laboratory protocols for regulatory applications still needed

Central Valley, California implementing eDNA to support appropriate ammonia criteria



USGS



Locations of eDNA samples for *A. nuttalliana* in Utah from 2016-2019 (Rodgers, 2020)

UDWR Native Mussel Recovery Program

Water body	Live individuals ever found?	eDNA detection (Rodgers 2020)*	Year of last live observation	Most recent survey year	# surveys since 2000	Needs
Bear River	Y	Pos	2001a	2001a	1	Survey
Big Creek	Y	Pos	1990b	1998g	0	Survey
EF Sevier River	Y	Pos	2019f	2019f	1	Survey
Goose Creek	Y	Pos	2001a	2001a	1	Survey
Otter Creek Reservoir	Y	Pos	2001a	2001a	1	Survey
Pole Creek	Y	Pos	2012d	2012d	2	Survey
Pruess Lake	Y	Pos	2012e	2012d	1	Survey
Raft River	Y	Pos	2018f	2018f	3	Monitor
Salt Creek	Y	Pos	2019c	2020d	3	Monitor
Burraston Ponds	Y	Neg	2001a	2018d	3	Restoration?
Currant Creek	Y	Neg	2016c	2018d	2	Restoration?
Cutler Reservoir	Y	Neg	2006d	2019d,e,h	4	Restoration?
Decker Lake	Y	Neg	Unknown	2018d	1	
Piute Reservoir	Y	Neg	2018e	2018d	3	Monitor
Mona Springs	Y	NA	2018d	2018d	2	Monitor
Redden Spring	Y	NA	2018d	2018d	3	Monitor
Upper Otter Creek	U	Pos	NA	NA	0	Survey
Sevier River	U	Neg	NA, shells in 2018d	2018d	1	Survey
Gunnison Bend Reservoir	U	NA	NA, shells in 2014d	2014d	1	Survey
Basin Creek	U	Neg	NA	NA	0	
East Canyon Creek	U	Neg	NA	NA	0	
Otter Creek	U	Neg	NA	1993g	0	
Provo River	U	Neg	NA	NA	?	
SF Provo River	U	Neg	NA	NA	0	
Upper Big Creek	U	Neg	NA	NA	0	
Little Bear River	U	NA	1930?	2019h	1	
Jordan River	U	NA	NA	2019c	2	
Spring Creek	U	NA	NA, shells in 2014c	2014	1	
State Canal	U	NA	NA	2019	1	

UT *Anodonta* survey locations and dates

- a Mock et al. 2004
- b Clark 1993
- c Richards
- d UDWR
- e Wagner
- f Rodgers 2020
- g Hovingh 2018
- h Nielson

* if there was a positive detection anywhere in the waterbody, it was recorded as positive here

Green = Rodgers feels these locations could be safe from water level drawdowns seen in reservoirs



Ammonia and Utah Unionids

Only two unionid mussel species are potential “residents” in Utah

- *Anodonta nuttalliana* (previously *californiensis*)
- *Margaratifera falcata*

The unionid species in EPA’s national toxicity database are currently surrogates for the Utah unionid species.

Utah needs toxicity testing for *A. nuttalliana* and *M. falcata* to apply SDP



A. nuttalliana (J. Cassidy, KQED)



M. falcata (USFWS)

Central Valley Clean Water Association

Wastewater operators consortium

Acute tests run for 4 California unionid mussels

- *Anodonta nuttalliana*
- *Anodonta oregonensis*
- *Margaratifera falcata*
- *Gonidea angulata*

Deleted 4 fish species and 10 unionid species from EPA (2013) database

- Mountain whitefish
- Atlantic salmon
- Sunshine bass
- White perch



Central Valley Clean Water Association

Phase IIc Freshwater Mussel
Collaborative Study for Wastewater
Treatment Plants:
Ammonia Criteria Recalculation
Final Report



Prepared for:
Central Valley Clean Water Association

Prepared by:



In association with:



January 2020

January 2020

CVCWA recalculated criteria but not a standards change

Criterion Duration	USEPA 1999	USEPA 2013	Central Valley Site-Specific
Acute (1-hour average)	24 ^b	17	24 ^b
Chronic (30-day average)	4.5*	1.9*	4.3*

* The highest four-day average within the 30-day period should not exceed 2.5 times the CCC.

a – All values in mg TAN/L at pH7 and 20°C.

b – *Oncorhynchus* species present.

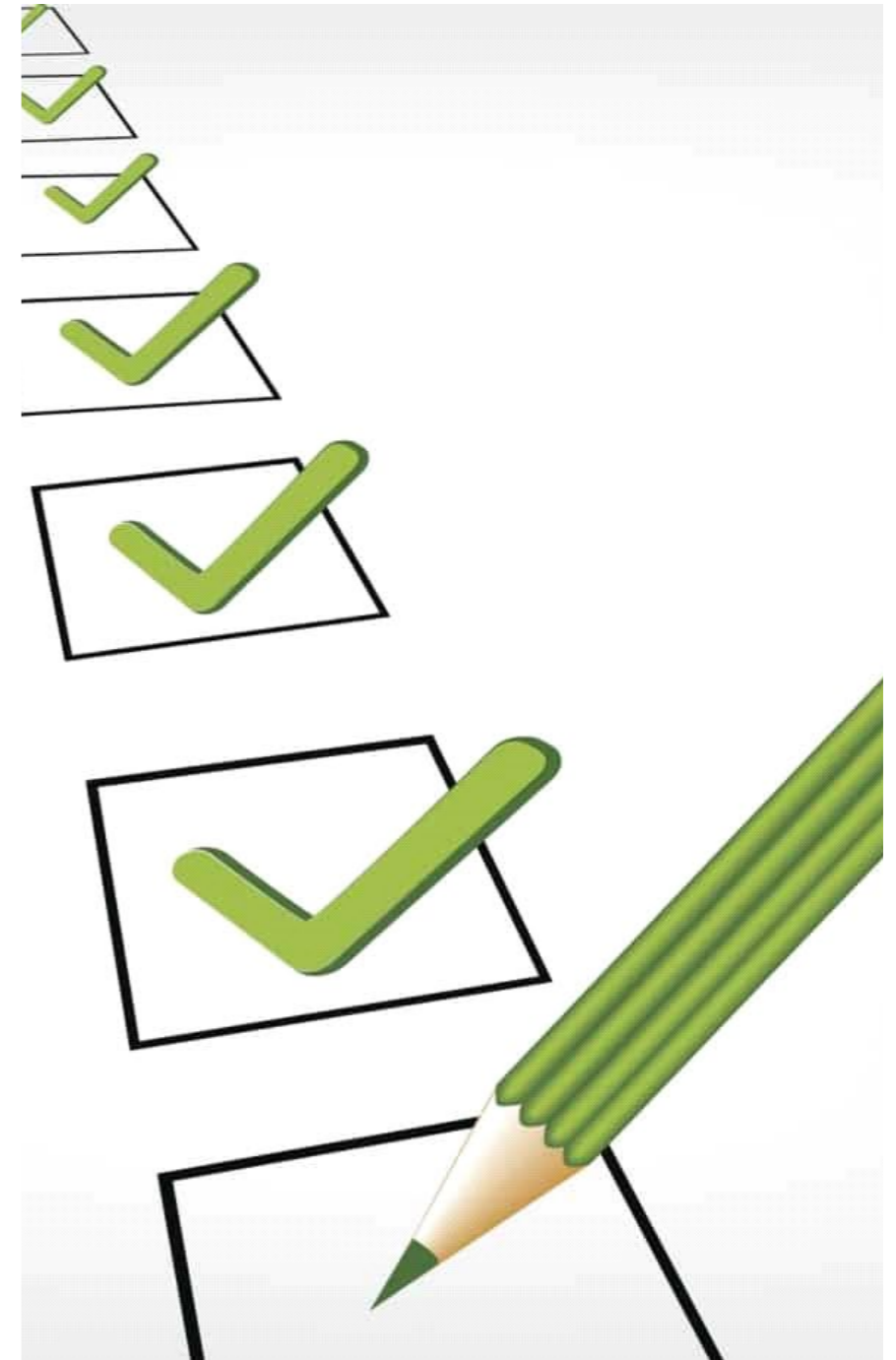
Utah

Toxicity data now available for all resident unionid species.

Species deletion relatively straightforward

- delete all unionids from EPA database
- delete fish: Atlantic salmon, white perch, sunshine bass
- add data for 2 resident unionid species
- conserve temperature/pH relationships
- recalculate

If Utah-specific unionid mussel present criteria similar to existing criteria, mussel surveys may not be necessary.



Next Steps

1. Implement the recalculation procedure for Utah.
2. If unionid mussels present criteria similar or less stringent than current criteria, reevaluate current plans to survey POTW receiving waters
3. Update Utah Implementation Plan

