

# The State of the Vrain:

A native fish community health assessment for the streams of  
Longmont, CO



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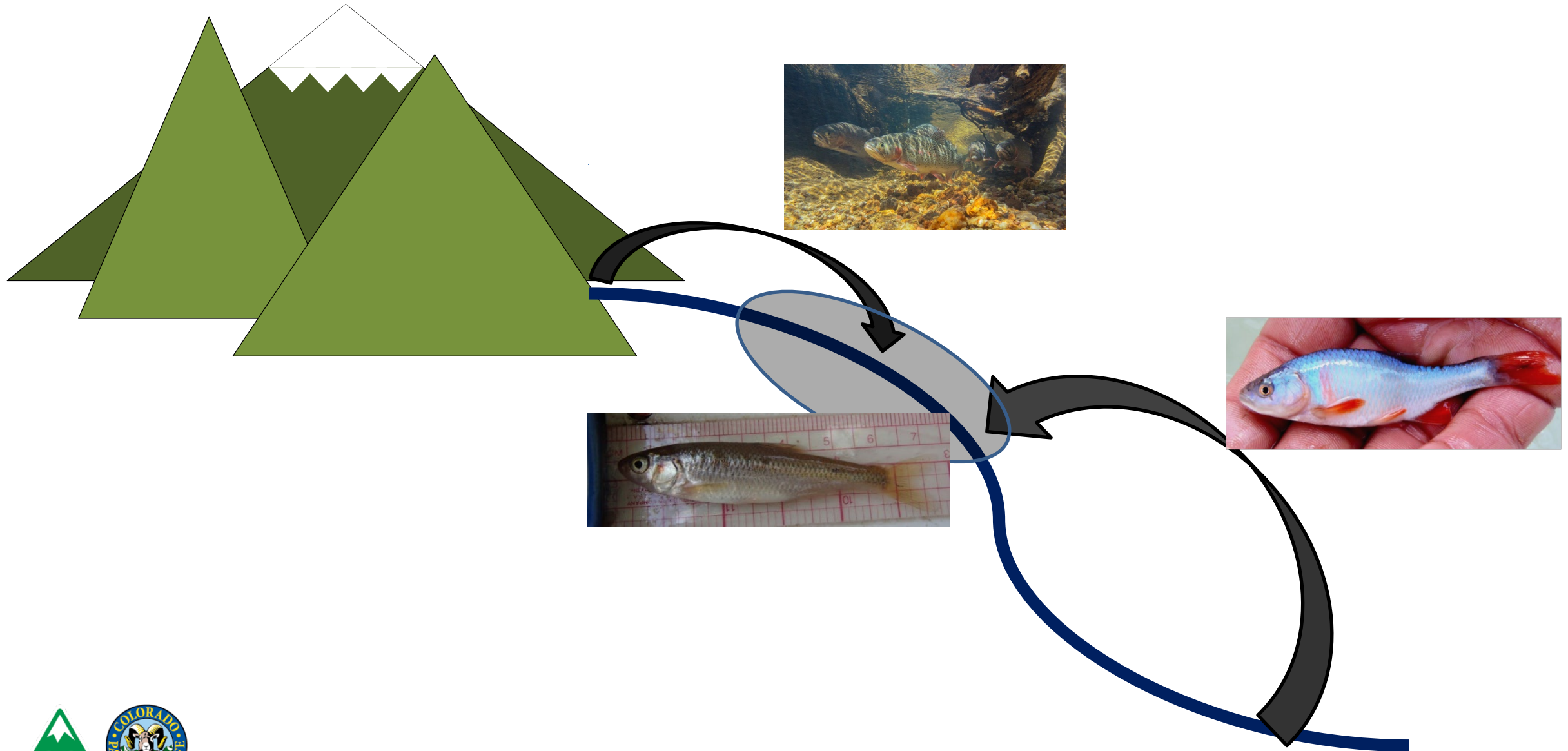


# Presentation Overview

- What is a transition zone stream?
- The Fishes of St. Vrain Creek
- The St. Vrain Report Card
- Trends in Species of Greatest Conservation Need (SGCN)
- Trends in non-native fishes
- Goals



# The transition zone: A unique aquatic environment



# Unique features of transition zone streams

- Cool water- not cold, not warm, intermediate substrate types
- High species richness
- “Glacial relict” species  
(Fausch and Bestgen 1997)



Common Shiner



Johnny Darter



Northern Redbelly Dace



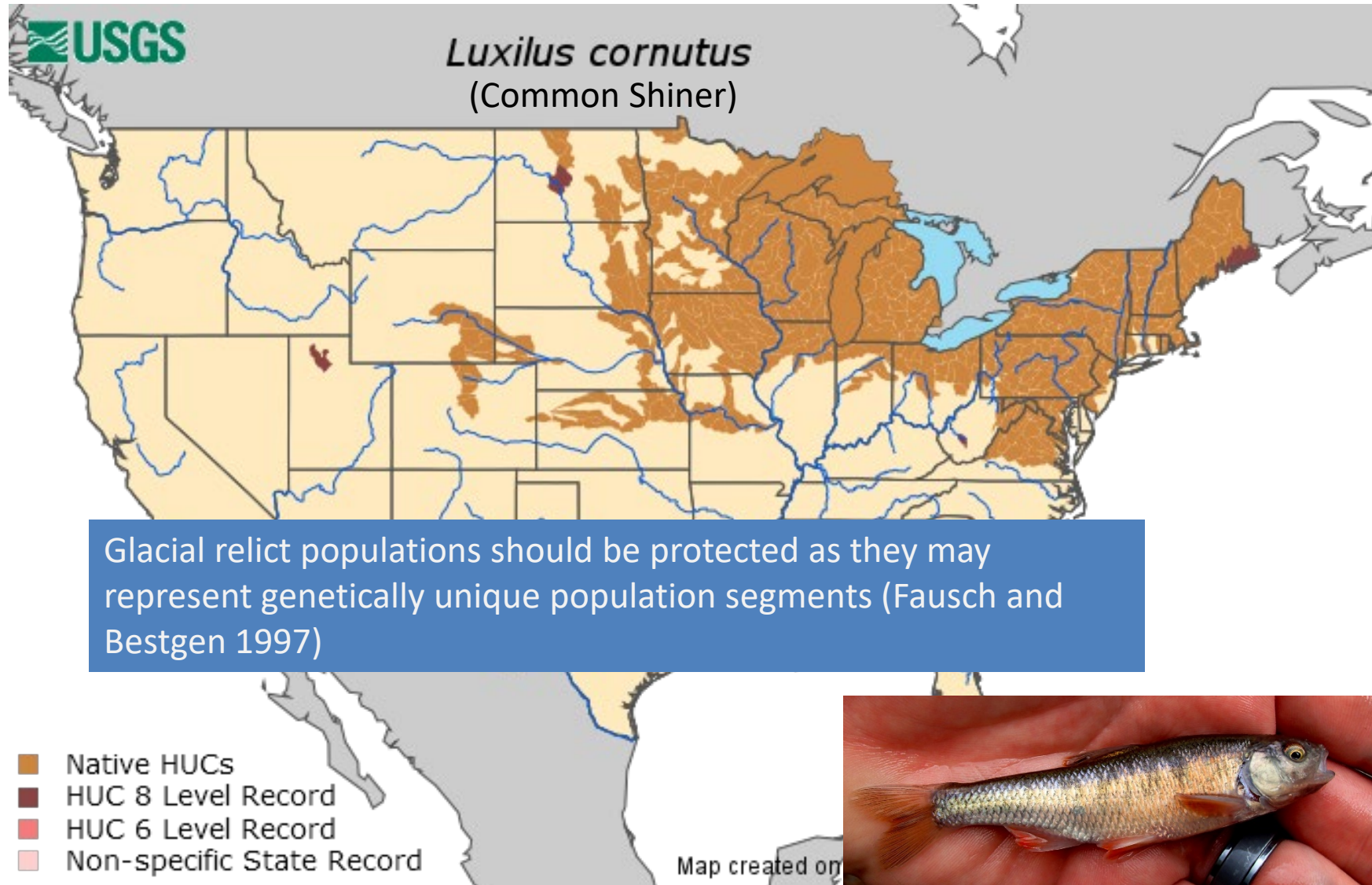
Stonecat



St. Vrain Creek @ Golden Ponds



# Glacial Relicts: Distribution



# Impacts to transition zone and plains streams

- Urban and water development
  - water quality degradation
  - channelization of streams for flood control
  - habitat fragmentation
  - non-native species



St. Vrain at Izaak Walton Ponds, Longmont, CO



Beckwith Diversion, Golden Ponds, Longmont, CO



# The Native Fishes of St. Vrain Creek

*A CPW Priority for Conservation*



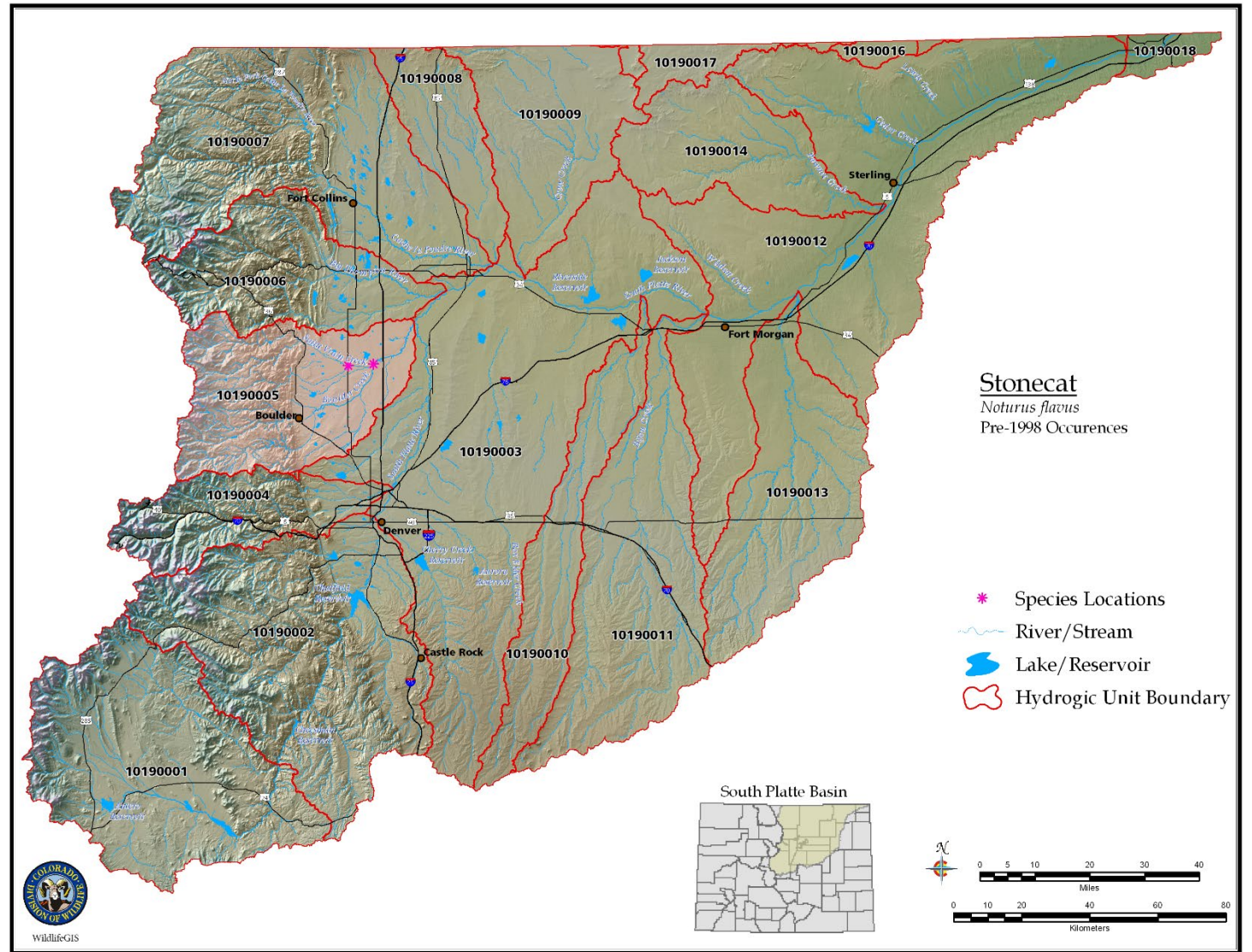
Number	Species	Last Observed	State Status
1	CENTRAL STONEROLLER	2018	
2	IOWA DARTER	2018	SC; Tier 2
3	BLACK BULLHEAD	2018	
4	PLAINS TOPMINNOW	2018	Tier 1
5	CREEK CHUB	2018	
6	FATHEAD MINNOW	2018	
7	JOHNNY DARTER	2018	
8	LONGNOSE SUCKER	2018	
9	LONGNOSE DACE	2018	
10	RED SHINER	2018	
11	SAND SHINER	2018	
12	GREEN SUNFISH	2018	
13	WHITE SUCKER	2018	
14	STONECAT****	2018	Tier 1
15	ORANGESPOTTED SUNFISH	2015	SC; Tier 1
16	COMMON SHINER****	2013	ST; Tier 1
17	LAKE CHUB	2007	SE; Tier 2
18	BRASSY MINNOW	2006	ST; Tier 1
19	BIGMOUTH SHINER	1999	
20	PLAINS KILLIFISH	1996	
21	NORTHERN REDBELLY DACE	1985	SE; Tier 1
22	SUCKERMOUTH MINNOW	1973	SE; Tier 1
23	HORNYHEAD CHUB	1903	Extirpated
24	CARPIODES (Quillback and Carpsucker)	Undocumented	
25	BLACKNOSE SHINER	Undocumented	Extirpated



# Stonecat (*Noturus flavus*)



Found in only 1 stream in  
South Platte Basin- 2  
streams in all of Colorado





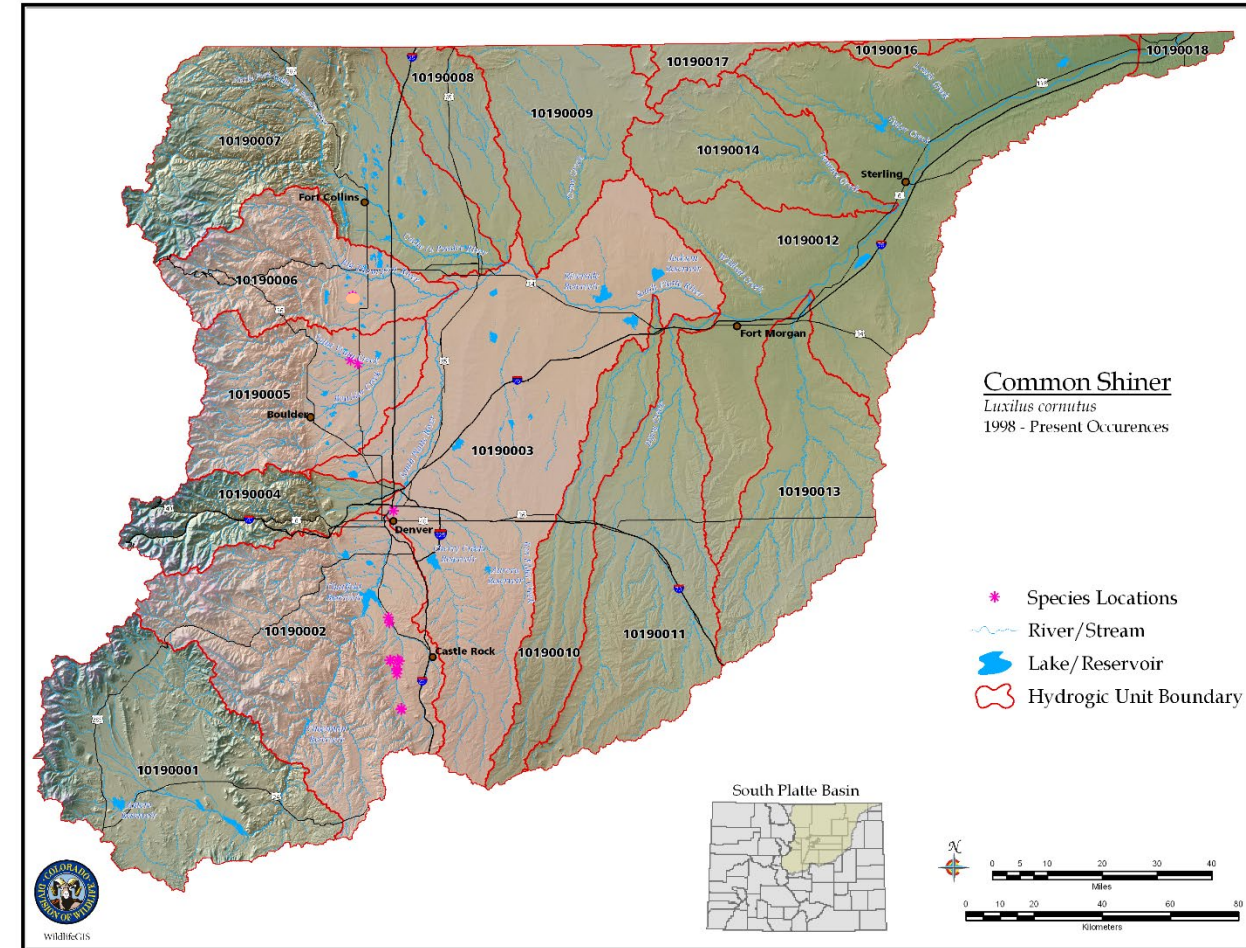
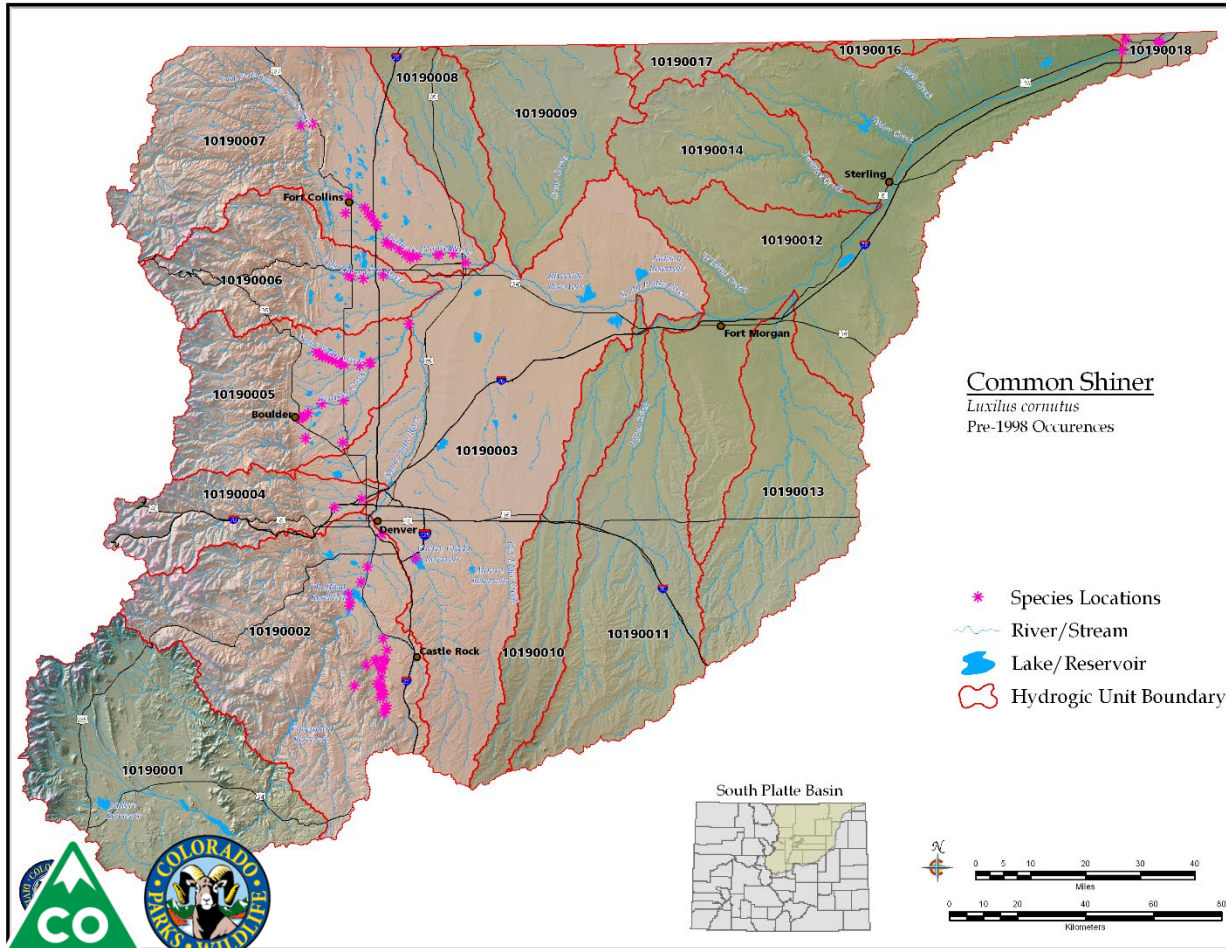
# Common shiner (*Luxilus cornutus*)

- Transition zone obligate, in decline
- Disappeared from St. Vrain following flood



Pre-1998

1998 to 2010



# Native Fish Community Health Assessment:

## “Saint Vrain Report Card”

Grading Scale	
Grade	No. Native Spp.
A	> 12
B+	11-12
B	10
B-	9
C	7-8
D	5-6
F	<5

Number	Species	Last Observed	State Status
1	CENTRAL STONEROLLER	2018	
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4	PLAINS TOPMINNOW	2018	Tier 1
5	CREEK CHUB	2018	
6	FATHEAD MINNOW	2018	
7	JOHNNY DARTER	2018	
8	LONGNOSE SUCKER	2018	
9	LONGNOSE DACE	2018	
10	RED SHINER	2018	
11	SAND SHINER	2018	
12	GREEN SUNFISH	2018	
13	WHITE SUCKER	2018	
14	STONECAT****	2018	Tier 1
15	ORANGESPOTTED SUNFISH	2015	SC; Tier 1
16	COMMON SHINER****	2013	ST; Tier 1
17	LAKE CHUB	2007	SE; Tier 2
18	BRASSY MINNOW	2006	ST; Tier 1
19	BIGMOUTH SHINER	1999	
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21	NORTHERN REDBELLY DACE	1985	SE; Tier 1
22	SUCKERMOUTH MINNOW	1973	SE; Tier 1
23	HORNYHEAD CHUB	1903	Extirpated
24	CARPIODES (Quillback and Carpsucker)	Undocumented	
25	BLACKNOSE SHINER	Undocumented	Extirpated



		Study Year												
Reach	Location	1986*	1994*	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
1	Sandstone			C	B	B-		B		B+	B	B	B+	B-
	Peschel										B+	B+	B+	B+
	US of CR1										B	B+	B+	B
	<b>Reach 1 Composite Score:</b>			<b>C</b>	<b>B</b>	<b>B-</b>		<b>B</b>		<b>B+</b>	<b>B+</b>	<b>B+</b>	<b>B+</b>	<b>B</b>
2	LHC Confluence							C		B				
	DS of Bonus (Dickens 1)							B	B+	B-	B	B+		B+
	US of Bonus (Dickens 2)		B+		B-	F	D	C	B	B-				
	Izaak Walton						C	C		D	C	B-	B-	C
	Fairgrounds	B+	B+					C		B-	C	B-	B-	
	DS of Beckwith					B	D	C	B+	B-	B	B+	B+	B
	US of Beckwith	B+		C	D		D	C	C	C		D	C	D
	<b>Reach 2 Composite Score:</b>	<b>B+</b>	<b>B+</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>D</b>	<b>C</b>	<b>B</b>	<b>C</b>	<b>C</b>	<b>B-</b>	<b>B-</b>	<b>C+</b>
3	DS of Niwot		B-							D	C			
	US of Niwot	B+	B-			F		F	F	C	D	D	F	F
	700m Abv 75th	D		F		F				D	F	F	F	F
	Abv Crane Hollow										F	F	F	F
	DS of 61st	D								D	D	F	F	C
	US of Oligarchy	D								F				
	US of Long. Supply									F	F	F	F	
	Highland Dr.									F	D	F	F	F
	<b>Reach 3 Composite Score:</b>	<b>C</b>	<b>B-</b>	<b>F</b>		<b>F</b>		<b>F</b>	<b>F</b>	<b>D</b>	<b>D</b>	<b>F</b>	<b>F</b>	<b>F+</b>

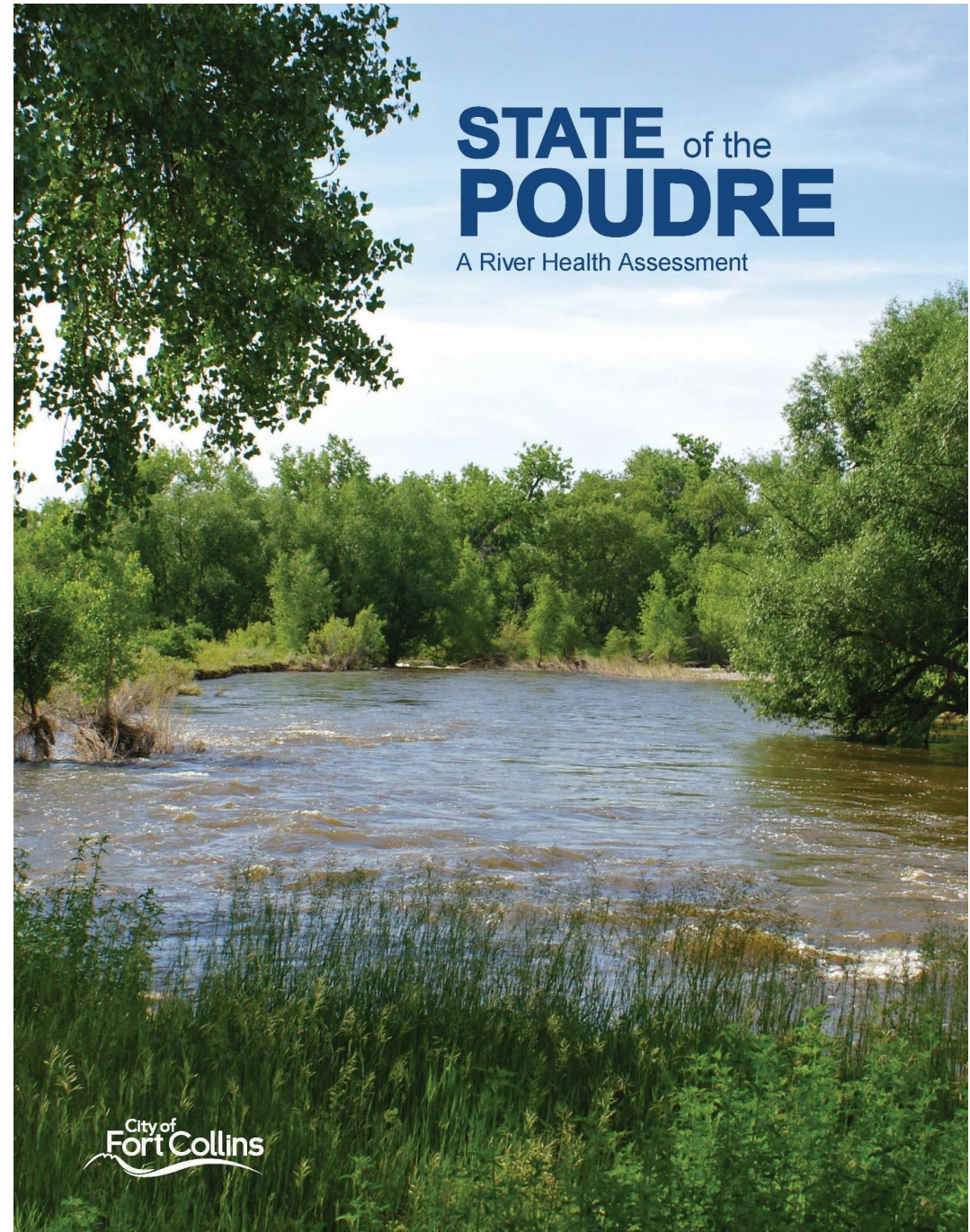


# For Comparison: The Poudre River Report Card

2016

Reach Location	Poudre River	St. Vrain Creek
Urban Reach	C-	B-
Plains Reach	D	B

When compared with any other front range stream (e.g. Big Thomposn, Boulder Creek), St. Vrain Creek is our star performer!!



		Study Year												
Reach	Location	1986*	1994*	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
1	Sandstone			C	B	B-		B		B+	B	B	B+	B-
	Peschel										B+	B+	B+	B+
	US of CR1										B	B+	B+	B
	<b>Reach 1 Composite Score:</b>			<b>C</b>	<b>B</b>	<b>B-</b>		<b>B</b>		<b>B+</b>	<b>B+</b>	<b>B+</b>	<b>B+</b>	<b>B</b>
2	LHC Confluence							C		B				
	DS of Bonus (Dickens 1)							B	B+	B-	B	B+		B+
	US of Bonus (Dickens 2)		B+		B-	F	D	C	B	B-				
	Izaak Walton						C	C		D	C	B-	B-	C
	Fairgrounds	B+	B+					C		B-	C	B-	B-	
	DS of Beckwith					B	D	C	B+	B-	B	B+	B+	B
	US of Beckwith	B+		C	D		D	C	C	C		D	C	D
	<b>Reach 2 Composite Score:</b>	<b>B+</b>	<b>B+</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>D</b>	<b>C</b>	<b>B</b>	<b>C</b>	<b>C</b>	<b>B-</b>	<b>B-</b>	<b>C+</b>
3	DS of Niwot		B-							D	C			
	US of Niwot	B+	B-			F		F	F	C	D	D	F	F
	700m Abv 75th	D		F		F				D	F	F	F	F
	Abv Crane Hollow										F	F	F	F
	DS of 61st	D								D	D	F	F	C
	US of Oligarchy	D								F				
	US of Long. Supply									F	F	F	F	
	Highland Dr.									F	D	F	F	F
	<b>Reach 3 Composite Score:</b>	<b>C</b>	<b>B-</b>	<b>F</b>		<b>F</b>		<b>F</b>	<b>F</b>	<b>D</b>	<b>D</b>	<b>F</b>	<b>F</b>	<b>F+</b>



		Species of Greatest Conservation Need- Tier 1 STONECAT												
Reach	Location	1986*	1994*	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
1	Sandstone			-	-	-		1		-	-	-	1	1
	Peschel										2	1	4	6
	US of CR1										1	-	-	18
<b>Reach 1 Composite Score:</b>				<b>C</b>	<b>B</b>	<b>B-</b>		<b>B</b>		<b>B+</b>	<b>B+</b>	<b>B+</b>	<b>B+</b>	<b>B</b>
2	LHC Confluence							6		7				
	DS of Bonus (Dickens 1)							26	35	13	42	21		17
	US of Bonus (Dickens 2)		x		5	3	8	8	15	1				
	Izaak Walton						47	47		5	22	35	54	21
	Fairgrounds	-	-					56		3	3	15	14	
	DS of Beckwith					8	2	16	21	4	3	25	66	29
	US of Beckwith	-		-	-		-	-	-	-		-	-	-
<b>Reach 2 Composite Score:</b>		<b>B+</b>	<b>B+</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>D</b>	<b>C</b>	<b>B</b>	<b>C</b>	<b>C</b>	<b>B-</b>	<b>B-</b>	<b>C+</b>
3	DS of Niwot		-							-	-			
	US of Niwot	-	-			-		-	-	-	-	-	-	-
	700m Abv 75th	-		-		-				-	-	-	-	-
	Abv Crane Hollow										-	-	-	-
	DS of 61st	-								-	-	-	-	-
	US of Oligarchy	-								-				
	US of Long. Supply									-	-	-	-	-
Highland Dr.									-	-	-	-	-	
<b>Reach 3 Composite Score:</b>		<b>C</b>	<b>B-</b>	<b>F</b>		<b>F</b>		<b>F</b>	<b>F</b>	<b>D</b>	<b>D</b>	<b>F</b>	<b>F</b>	<b>F+</b>



		Species of Greatest Conservation Need- Tier 1 COMMON SHINER												
Reach	Location	1986*	1994*	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
1	Sandstone			-	-	-		-		-	-	-	-	-
	Peschel										-	-	-	-
	US of CR1										-	-	-	-
<b>Reach 1 Composite Score:</b>				<b>C</b>	<b>B</b>	<b>B-</b>		<b>B</b>	<b>B</b>	<b>B+</b>	<b>B+</b>	<b>B+</b>	<b>B+</b>	<b>B</b>
2	LHC Confluence							-		-				
	DS of Bonus (Dickens 1)							-	-	-	-	-	-	-
	US of Bonus (Dickens 2)		x		3	-	-	4	1	-				
	Izaak Walton						1	-		-	-	-	-	-
	Fairgrounds	x	x					-		-	-	-	-	-
	DS of Beckwith					2	-	-	1	-	-	-	-	-
	US of Beckwith	x		64	-		-	-	-	-		-	-	-
<b>Reach 2 Composite Score:</b>		<b>B+</b>	<b>B+</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>D</b>	<b>C</b>	<b>B</b>	<b>C</b>	<b>C</b>	<b>B-</b>	<b>B-</b>	<b>C+</b>
3	DS of Niwot		x							-	-			
	US of Niwot	x	x			-		-	-	-	-	-	-	-
	700m Abv 75th	x		-		-				-	-	-	-	-
	Abv Crane Hollow										-	-	-	-
	DS of 61st	-								-	-	-	-	-
	US of Oligarchy	-								-				
	US of Long. Supply									-	-	-	-	-
	Highland Dr.									-	-	-	-	-
<b>Reach 3 Composite Score:</b>		<b>C</b>	<b>B-</b>	<b>F</b>		<b>F</b>		<b>F</b>	<b>F</b>	<b>D</b>	<b>D</b>	<b>F</b>	<b>F</b>	<b>F+</b>



		Species of Greatest Conservation Need- Tier 1 PLAINS TOPMINNOW												
Reach	Location	1986*	1994*	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
1	Sandstone			-	-	-		-		-	-	-	-	-
	Peschel										-	-	-	-
	US of CR1										-	-	-	-
<b>Reach 1 Composite Score:</b>				<b>C</b>	<b>B</b>	<b>B-</b>		<b>B</b>	<b>B</b>	<b>B+</b>	<b>B+</b>	<b>B+</b>	<b>B+</b>	<b>B</b>
2	LHC Confluence							-		-				
	DS of Bonus (Dickens 1)							-	-	-	-	-		-
	US of Bonus (Dickens 2)		-		-	-	-	-	1	-				
	Izaak Walton						-	-		-	-	-	-	-
	Fairgrounds	x	x					-		-	-	-	-	
	DS of Beckwith					2	1	2	1	-	-	2	2	1
	US of Beckwith	x		1	15		42	54	1	4		-	1	-
<b>Reach 2 Composite Score:</b>		<b>B+</b>	<b>B+</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>D</b>	<b>C</b>	<b>B</b>	<b>C</b>	<b>C</b>	<b>B-</b>	<b>B-</b>	<b>C+</b>
3	DS of Niwot		-							-	-			
	US of Niwot	-	-			-		-	-	-	-	-	-	-
	700m Abv 75th	-		-		-				-	-	-	-	-
	Abv Crane Hollow										-	-	-	-
	DS of 61st	-								-	-	-	-	-
	US of Oligarchy	-								-	-	-	-	-
	US of Long. Supply									-	-	-	-	-
	Highland Dr.									-	-	-	-	-
<b>Reach 3 Composite Score:</b>		<b>C</b>	<b>B-</b>	<b>F</b>		<b>F</b>		<b>F</b>	<b>F</b>	<b>D</b>	<b>D</b>	<b>F</b>	<b>F</b>	<b>F+</b>





		Non-Native Species – LARGEMOUTH BASS												
Reach	Location	1986*	1994*	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
1	Sandstone			5	29	101		54		55	125	54	30	60
	Peschel										69	14	22	43
	US of CR1										4	5	4	1
	<b>Reach 1 Composite Score:</b>			<b>C</b>	<b>B</b>	<b>B-</b>		<b>B</b>		<b>B+</b>	<b>B+</b>	<b>B+</b>	<b>B+</b>	<b>B</b>
2	LHC Confluence							44		-	108			
	DS of Bonus (Dickens 1)							161	293	152	224	23		173
	US of Bonus (Dickens 2)		-		34	28	2	168	134	198				
	Izaak Walton						115	119		224	177	2	8	14
	Fairgrounds	x	x					189		44	26	1	8	
	DS of Beckwith					168	140	144	350	380	113	47	122	231
	US of Beckwith	x		8	46		121	50	117	207		42	56	31
	<b>Reach 2 Composite Score:</b>	<b>B+</b>	<b>B+</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>D</b>	<b>C</b>	<b>B</b>	<b>C</b>	<b>C</b>	<b>B-</b>	<b>B-</b>	<b>C+</b>
3	DS of Niwot		x							38	52			
	US of Niwot	x	x			2		6	4	33	20	5	6	11
	700m Abv 75th	-		8		19				64	33	13	15	9
	Abv Crane Hollow										3	3	-	10
	DS of 61st	x								10	73	11	3	22
	US of Oligarchy	x								-				
	US of Long. Supply									-	30	2	26	
	Highland Dr.									-	-	-	2	6
	<b>Reach 3 Composite Score:</b>	<b>C</b>	<b>B-</b>	<b>F</b>		<b>F</b>		<b>F</b>	<b>F</b>	<b>D</b>	<b>D</b>	<b>F</b>	<b>F</b>	<b>F+</b>

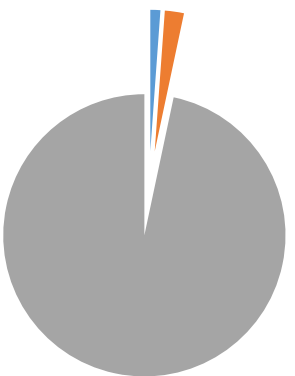


		Non-Native Species – WESTERN MOSQUITOFISH												
Reach	Location	1986*	1994*	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
1	Sandstone			214	-	42		31		200	100	34	58	63
	Peschel										49	124	74	37
	US of CR1										22	74	30	11
<b>Reach 1 Composite Score:</b>				<b>C</b>	<b>B</b>	<b>B-</b>		<b>B</b>		<b>B+</b>	<b>B+</b>	<b>B+</b>	<b>B+</b>	<b>B</b>
2	LHC Confluence							11		-	-			
	DS of Bonus (Dickens 1)							8	1	-	-	9		23
	US of Bonus (Dickens 2)		-		-	-	-	3	3	-				
	Izaak Walton						3	3		-	-	1	-	-
	Fairgrounds	x	-					-		-	-	-	-	
	DS of Beckwith					-	-	-	-	-	-	-	3	4
	US of Beckwith		-	-	-	-	-	-	-	-		-	-	1
<b>Reach 2 Composite Score:</b>		<b>B+</b>	<b>B+</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>D</b>	<b>C</b>	<b>B</b>	<b>C</b>	<b>C</b>	<b>B-</b>	<b>B-</b>	<b>C+</b>
3	DS of Niwot		-							-	-			
	US of Niwot		-			-		-	-	-	-	-	-	-
	700m Abv 75th			-		-				-	-	-	-	-
	Abv Crane Hollow										-	-	-	-
	DS of 61st		-							-	-	-	-	-
	US of Oligarchy		-							-				
	US of Long. Supply									-	-	-	-	-
Highland Dr.									1	-	-	-	-	
<b>Reach 3 Composite Score:</b>		<b>C</b>	<b>B-</b>	<b>F</b>		<b>F</b>		<b>F</b>	<b>F</b>	<b>D</b>	<b>D</b>	<b>F</b>	<b>F</b>	<b>F+</b>

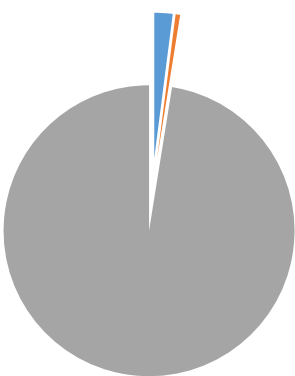


# Non-natives continued: largemouth bass and brown trout

**1986**



**1994**



- largemouth bass
- brown trout
- other species

**2010**



**2012**



**2014**



# Goals For St. Vrain Creek

- Should we strive to be A students?
- Or, is maintaining status quo the best we can do?
- Are there particular areas we can improve our grade?

Location	Composite Grade (2018)
Reach 1 (LHC to Boulder Cr.)	B
Reach 2 (Airport Rd. to LHC)	C+
Reach 3 (Lyon's to Airport Rd.)	F+



# The Stream Functions Pyramid

