



# Yakima Klickitat Fisheries Project

Michael Porter  
Fisheries Biologist

## Fish Predation Project

- Yakima River Basin
- Yakima River
- Piscivorous Fish Distributions & Management
- Yakima Delta Assessment Project



## Methods:

- ▣ Survey work was conducted via electro-fishing by boat and backpack
- ▣ Electro-fishing settings were:  
Volts: 350 Amps-1 Duty Cycle – CPS 3 Pulses  
Frequency: 60Hz
- ▣ Electro-fishing survey limitation are a depth of 4'
- ▣ GPS recorded total distances of surveys

# CHANNEL CATFISH - *Ictalurus Punctatus*



Introduced into Washington State in 1892 (Lampman 1946)  
Channel Catfish naturally produce in only the Columbia , Snake, Walla Walla, and  
Yakima Rivers.

# BROWN BULLHEAD - *Ameiurus Nebuloso*



Introduced into Washington State in 1882 - 1883(Lampman 1946)  
Brown Bullheads inhabit warm-water ponds, lakes, sloughs, and  
Sluggish areas in streams. (Yakima Delta)

# SMALLMOUTH BASS - *Micropterus dolomieu*



By 1925, 5000, Smallmouth Bass had been introduced to the Yakima River and had established resident populations. The Yakima River also serves as a spawning nursery for Smallmouth Bass of the Columbia River during the spring months

# LARGEMOUTH BASS - *Micropterus Salmoides*



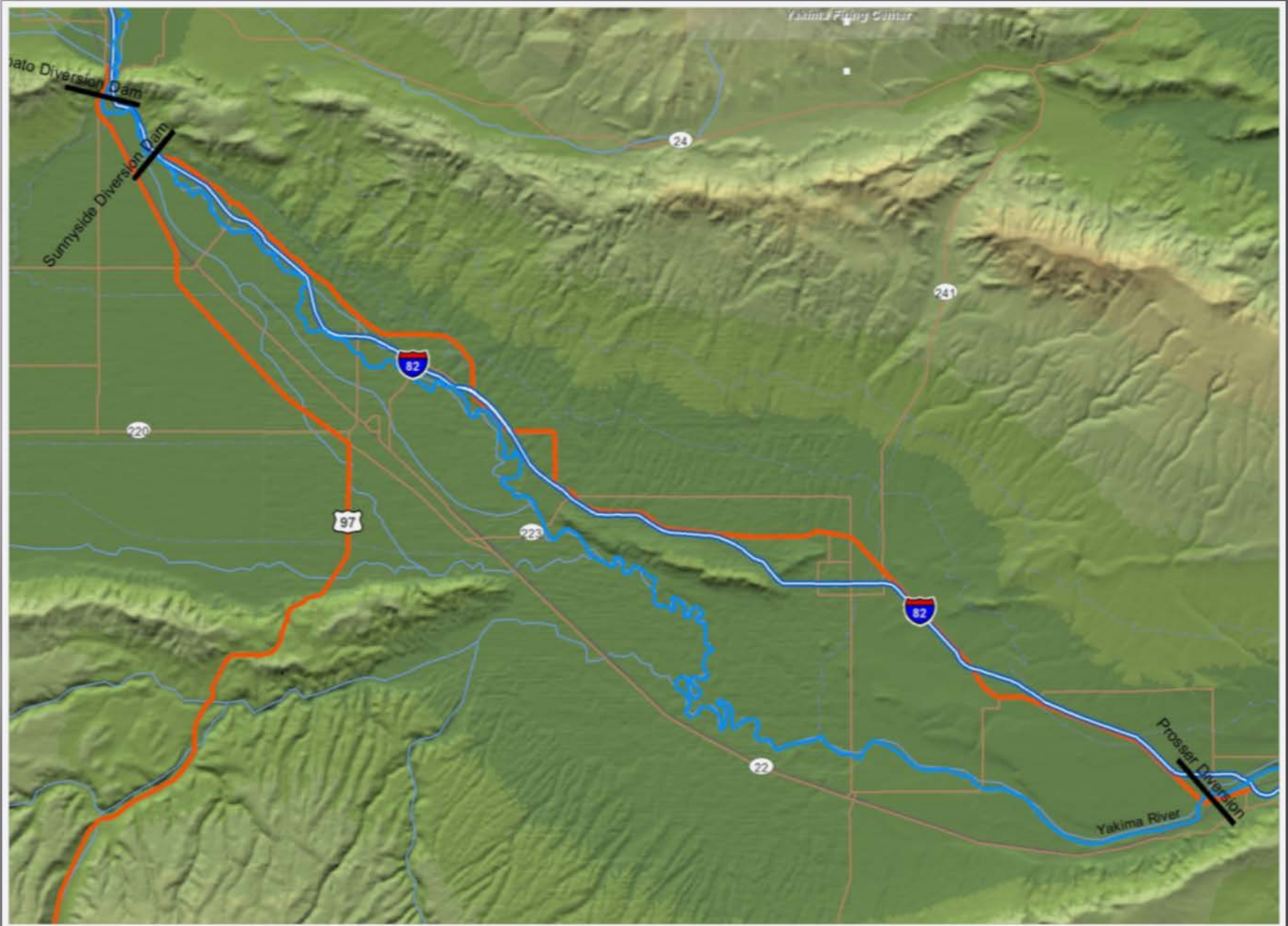
Widely introduced into Washington by 1895 the Largemouth Bass has established large populations in much of the Columbia River is frequently present in the Delta of the Yakima River

# NORTHERN PIKE MINNOW- *Ptychocheilus Oregonensis*



An indigenous predator of the northwest, Northern Pike Minnow numbers are currently managed via bounty, on the Columbia River . Management has been deemed necessary due to this fishes propensity to consume high numbers juvenile salmon.

# Wapato Reach Fish Survey Area – Sunnyside Dam to Prosser Dam



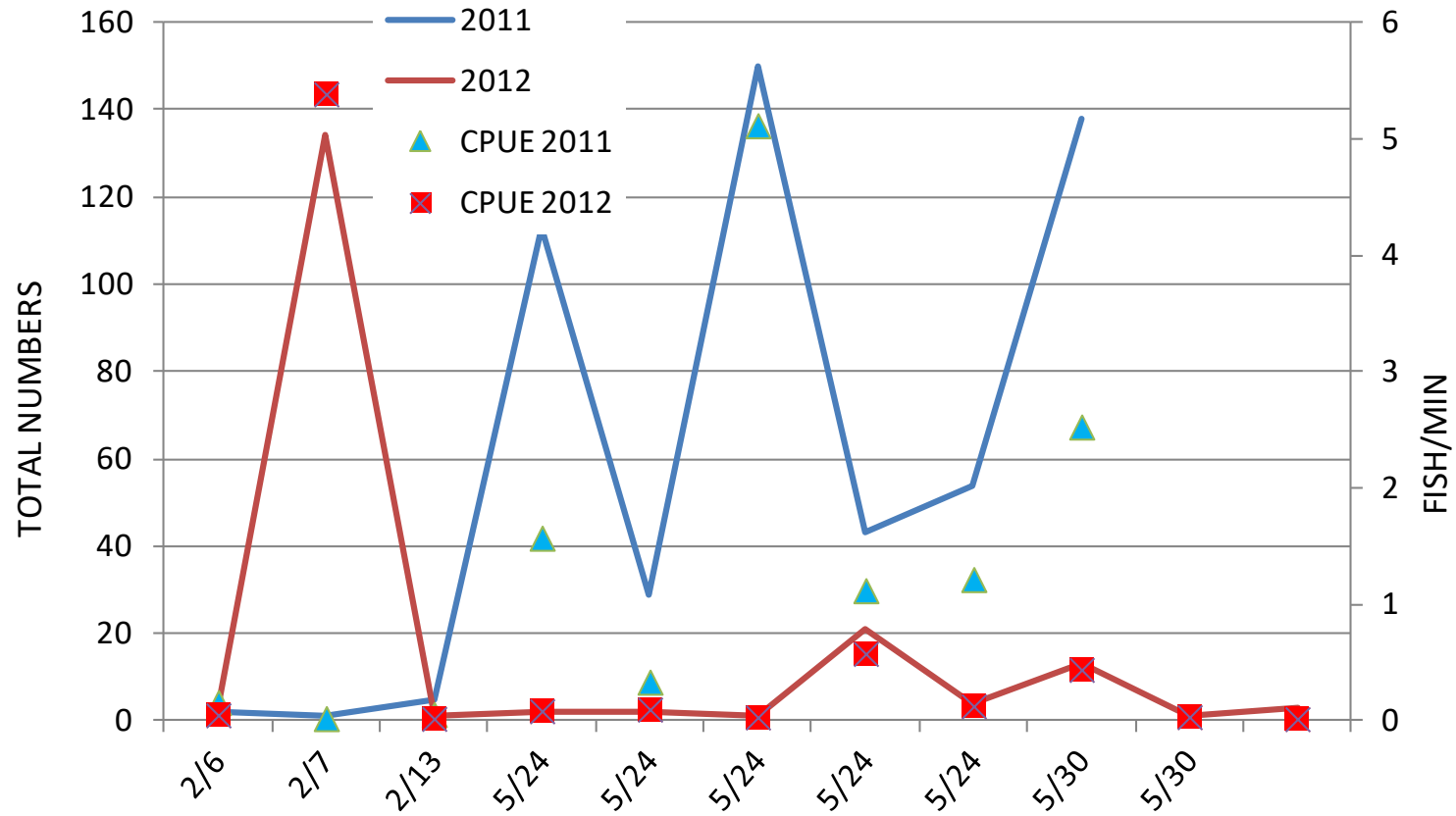


# WAPATO REACH

Northern Pike Minnow are the primary fish predator

The graph below depicts total numbers surveyed and Catch Per Unit Effort (CPUE)

CPUE is given in fish catch per minute



# Northern Pike Minnow - Wapato Reach



LOCATION	Date	YEAR	SPECIES	NUMBER	ELECTRODE MINUTES	CPUE
SHUSTER SIDE CHANNEL	3/25	2011	NPM	2	12.53	0.159617
BUENA BOAT LAUNCH	4/20	2011	NPM	1	45	0.022222
SNIPES SIDE CHANNEL	4/21	2011	NPM	5	87.93	0.056863
PARKER SC	5/3	2011	NPM	113	71.87	1.572283
YAKIMA RIVER-GRANGER	7/7	2011	NPM	29	86.48	0.335338
MENINICK SC	9/28	2011	NPM	150	29.32	5.115962
MENINICK SC	9/28	2011	NPM	43	38.35	1.121252
MENINICK SC	9/29	2011	NPM	54	44.38	1.216764
MENINICK SC	9/29	2011	NPM	138	54.6	2.527473
MENINICK 2 SC	2/6	2012	NPM	3	59.68	0.050268
MENINICK 2 SC	2/7	2012	NPM	134	24.88	5.385852
PARKER SC	2/13	2012	NPM	1	51.05	0.019589
MARION DRAIN	5/24	2012	NPM	2	23.37	0.08558
MENINICK	5/24	2012	NPM	2	20.13	0.099354
SUB-BASIN DRAIN 34	5/24	2012	NPM	1	31.37	0.031878
SUB-BASIN DRAIN 34	5/24	2012	NPM	21	36.35	0.577717
SUB-BASIN DRAIN 34	5/24	2012	NPM	4	31.37	0.12751
GRANGER UPPER	5/30	2012	NPM	13	29.52	0.440379
GRANGER UPPER	5/30	2012	NPM	1	28.95	0.034542
MABTON-SATUS	7/2	2012	NPM	3	172.27	0.017415

# SALMUTH BASS - WAPATO REACH

- Large numbers are isolated to near river ponds (periodically connected)
- Low numbers seen in main-stem of the Yakima River

LOCATION	DATE	SPECIES	NUMBERS	ELECTRODE MINUTES	CPUE
MENINICK SPRING POND	9/29/2011	SMB	108	41.77	2.585587742
NEAR MENINICK	2/6/2012	SMB	12	59.68	0.201072386
NEAR MENINICK	2/7/2012	SMB	2	24.88	0.080385852
WAYPOINT 216 SIDE CHANNEL	3/25/2011	SMB	3	12.53	0.239425379



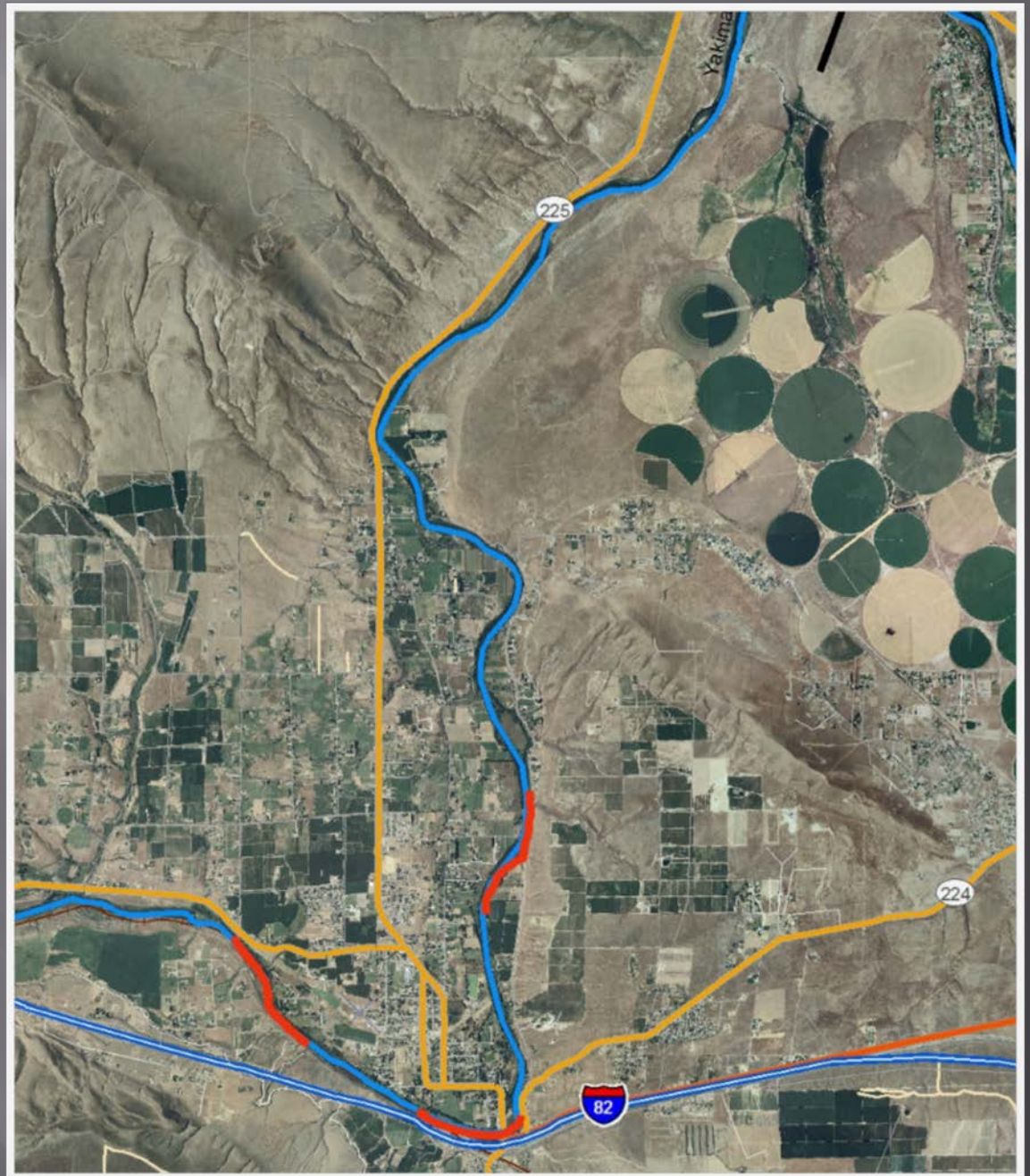
# Wapato Reach – Fish Predator Summaries

- Northern Pike Minnow the primary predator in the reach CPUE of over 5 fish per minute in side channels
- Smallmouth Bass found in limited numbers as juveniles  
In ponds near the river
- Brown Bullheads are present in side channels but in limited numbers
- Surveys are limited in summer months due to low CFS

# Benton Fish Survey Area

Surveys were conducted from Roza Irrigation/Power return plant to Wanawish Dam (dependent on CFS)

Red Highlighted Areas designate transects which were sampled using a two pass removal method (Multiple Date Data Presented)



## Smallmouth Bass - Benton

- Seen primarily as main-stem adults
- Relatively low CPUE's compared to Lower Yakima and Delta

LOCATION	Date	SPECIES	NUMBERS	ELECTRODE MINUTES	CPUE
BENTON	7/6/2011	SMB	2	18.97	0.10543
BENTON	7/6/2011	SMB	6	21.38	0.280636
BENTON	7/6/2011	SMB	10	20.07	0.498256
BENTON	7/6/2011	SMB	8	23.3	0.343348
BENTON	7/6/2011	SMB	24	49.45	0.485339
BENTON	7/6/2011	SMB	8	34.43	0.232356
BENTON	7/13/2011	SMB	2	6.72	0.297619
BENTON	7/13/2011	SMB	12	21.98	0.545951
BENTON	7/13/2011	SMB	15	24.18	0.620347
BENTON	7/13/2011	SMB	12	24.6	0.487805
BENTON	5/16/2012	SMB	5	28.97	0.172592
BENTON	5/16/2012	SMB	1	31.52	0.031726
BENTON	5/16/2012	SMB	2	19.42	0.102987
BENTON	5/16/2012	SMB	8	25.67	0.311648
BENTON	6/28/2012	SMB	5	23.25	0.215054
BENTON	6/28/2012	SMB	7	27.82	0.251618
BENTON	6/28/2012	SMB	3	25.58	0.117279
BENTON	6/28/2012	SMB	5	38.1	0.131234
BENTON	7/3/2012	SMB	2	48.07	0.041606

# Northern Pike minnow- Benton

- Primary fish predator of the reach
- High CPUE's in Spring and Summer Months

LOCATION	Date	SPECIES	NUMBER	ELECTRODE MINUTES	CPUE
BENTON	7/6/2011	NPM	7	18.97	0.36900369
BENTON	7/6/2011	NPM	3	21.38	0.140318054
BENTON	7/6/2011	NPM	13	20.07	0.647732935
BENTON	7/6/2011	NPM	12	23.3	0.515021459
BENTON	7/6/2011	NPM	51	49.45	1.031344793
BENTON	7/6/2011	NPM	33	34.43	0.958466454
BENTON	7/13/2011	NPM	2	6.72	0.297619048
BENTON	7/13/2011	NPM	8	36.47	0.219358377
BENTON	7/13/2011	NPM	21	98.98	0.212164074
BENTON	7/13/2011	NPM	17	21.98	0.773430391
BENTON	7/13/2011	NPM	22	24.18	0.909842845
BENTON	7/13/2011	NPM	11	24.6	0.447154472
BENTON	5/16/2012	NPM	5	28.97	0.172592337
BENTON	5/16/2012	NPM	12	31.52	0.38071066
BENTON	6/28/2012	NPM	7	23.25	0.301075269
BENTON	6/28/2012	NPM	2	27.82	0.071890726
BENTON	6/28/2012	NPM	15	25.58	0.586395622
BENTON	6/28/2012	NPM	33	38.1	0.866141732
BENTON	7/3/2012	NPM	9	48.07	0.187226961
BENTON	5/16/2012	NPM	1	25.67	0.03895598

## Lower Yakima River Fish Survey Area

Surveys were also conducted from the Wanawish Dam to the Yakima River Delta (dependent on CFS)

Red Highlighted Areas designate transects which were sampled using a two pass removal method  
*(Data presented represents only the initial pass)*





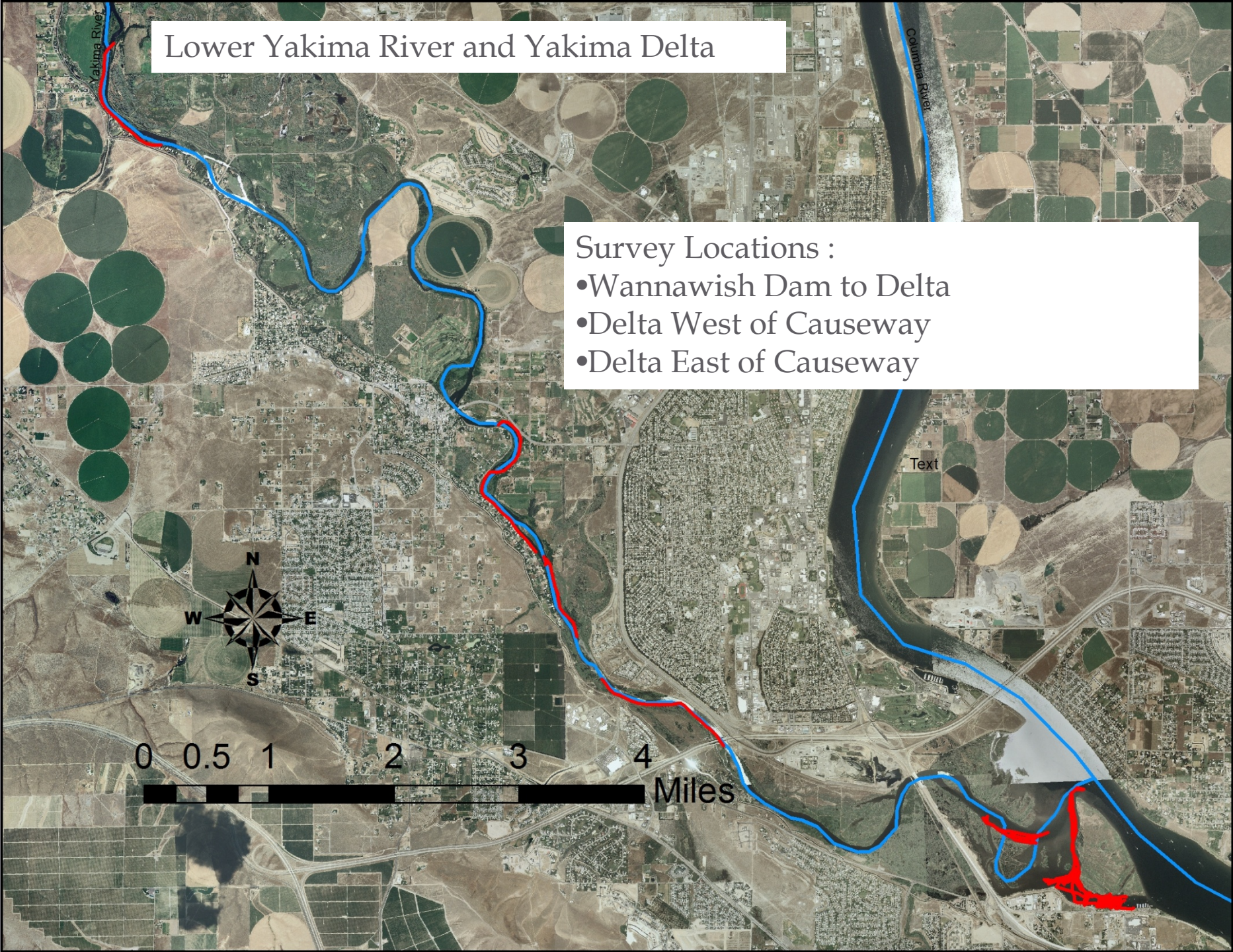
## Lower Yakima River Fish Predators

- The Lower Yakima River contains all of the 5 main predators
- The primary predator in this reach is smallmouth bass
- Spring brings large numbers of Smallmouth bass into this section of the river
- Northern Pikeminnow are frequently found in this reach in the form of juveniles
- The other 3 predators are found in low numbers in this reach

# Lower Yakima River and Yakima Delta

## Survey Locations :

- Wannawish Dam to Delta
- Delta West of Causeway
- Delta East of Causeway



West of Causeway Below Bateman Island Displayed Greatest Utilization of Exotic Species and Fish Predators primarily:

- Smallmouth Bass
- Largemouth Bass
- Brown Bullhead



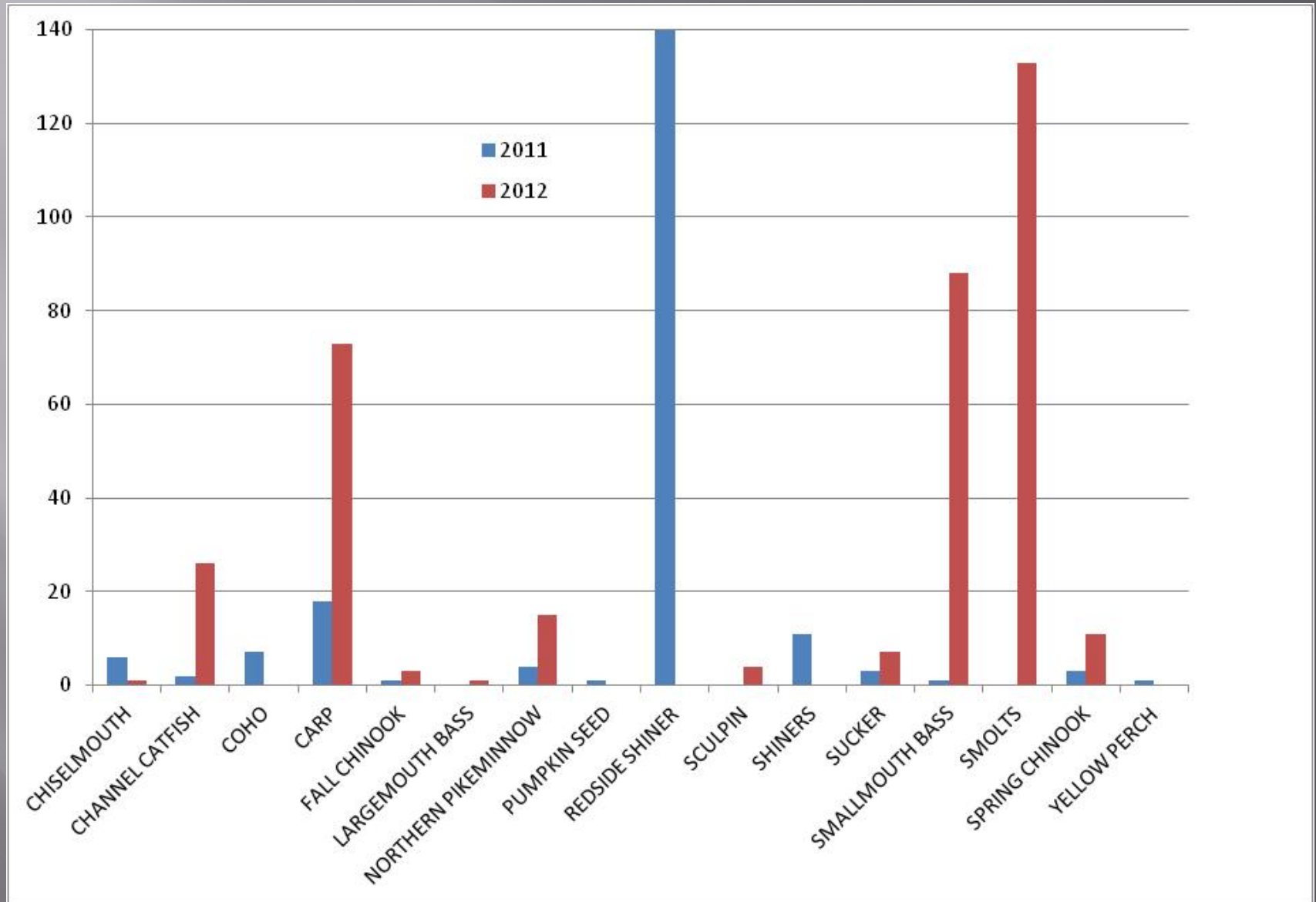
# Yakima River Delta Assessment Project

## *Spring Fish Species:*

### DELTA WEST CAUSEWAY

- CHISELMOUTH
- CHANNEL CATFISH
- COHO
- CARP
- FALL CHINOOK
- LARGEMOUTH BASS
- NORTHERN PIKEMINNOW
- PUMPKIN SEED
- REDSIDE SHINER
- SCULPIN
- SHINERS
- SUCKER
- SMALLMOUTH BASS
- SMOLTS
- SPRING CHINOOK
- YELLOW PERCH

# Spring Fish Totals: Yakima Delta West of Causeway



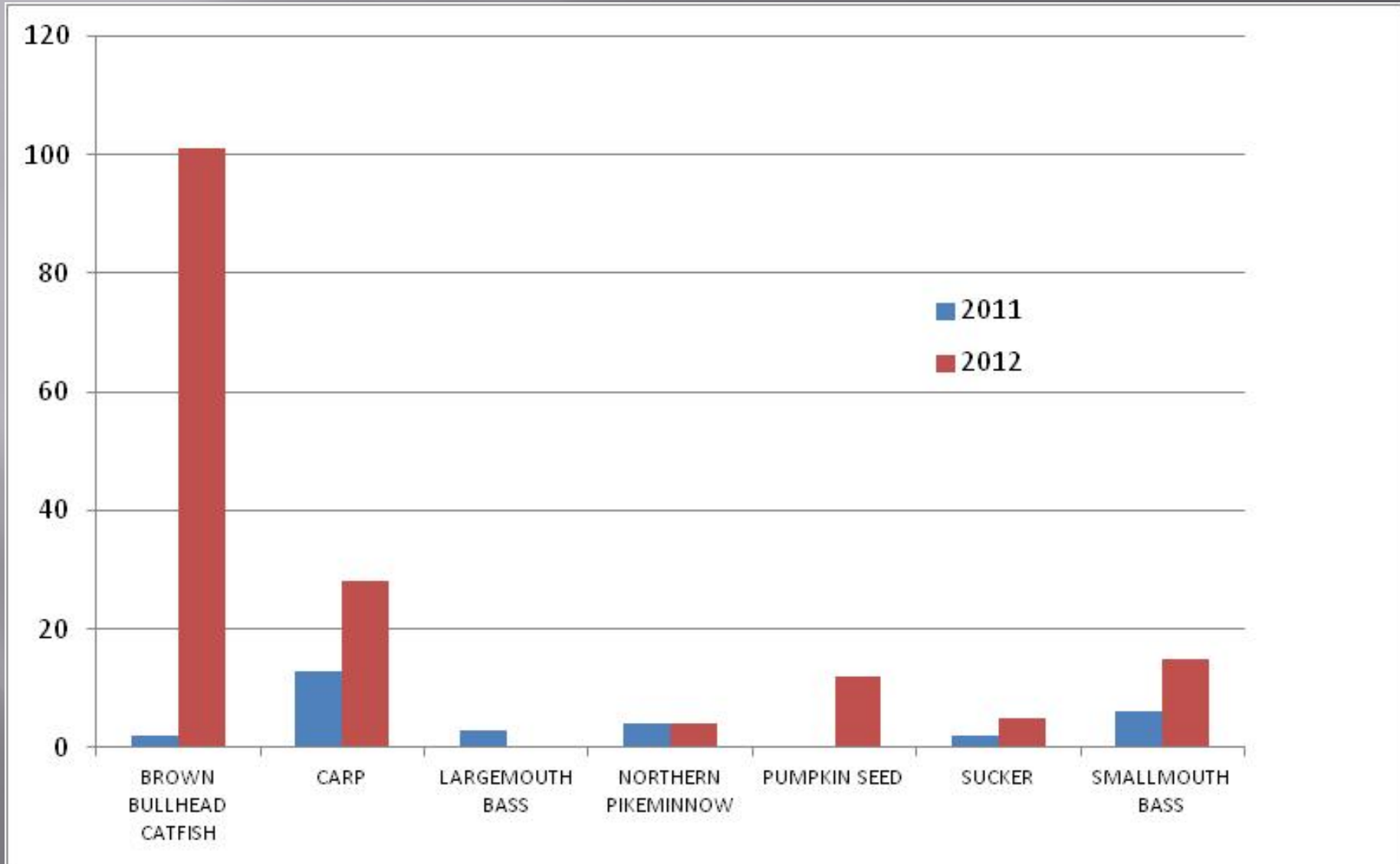
*Red Side Shiner numbers totaled 1002 for 2011 and are not represented in full in graph*

## *Summer Fish Species:*

### DELTA WEST OF CAUSEWAY

- BROWN BULLHEAD CATFISH
- CARP
- LARGEMOUTH BASS
- NORTHERN PIKEMINNOW
- PUMPKIN SEED
- SUCKER
- SMALLMOUTH BASS

## Summer Fish Totals: Yakima Delta West of Causeway



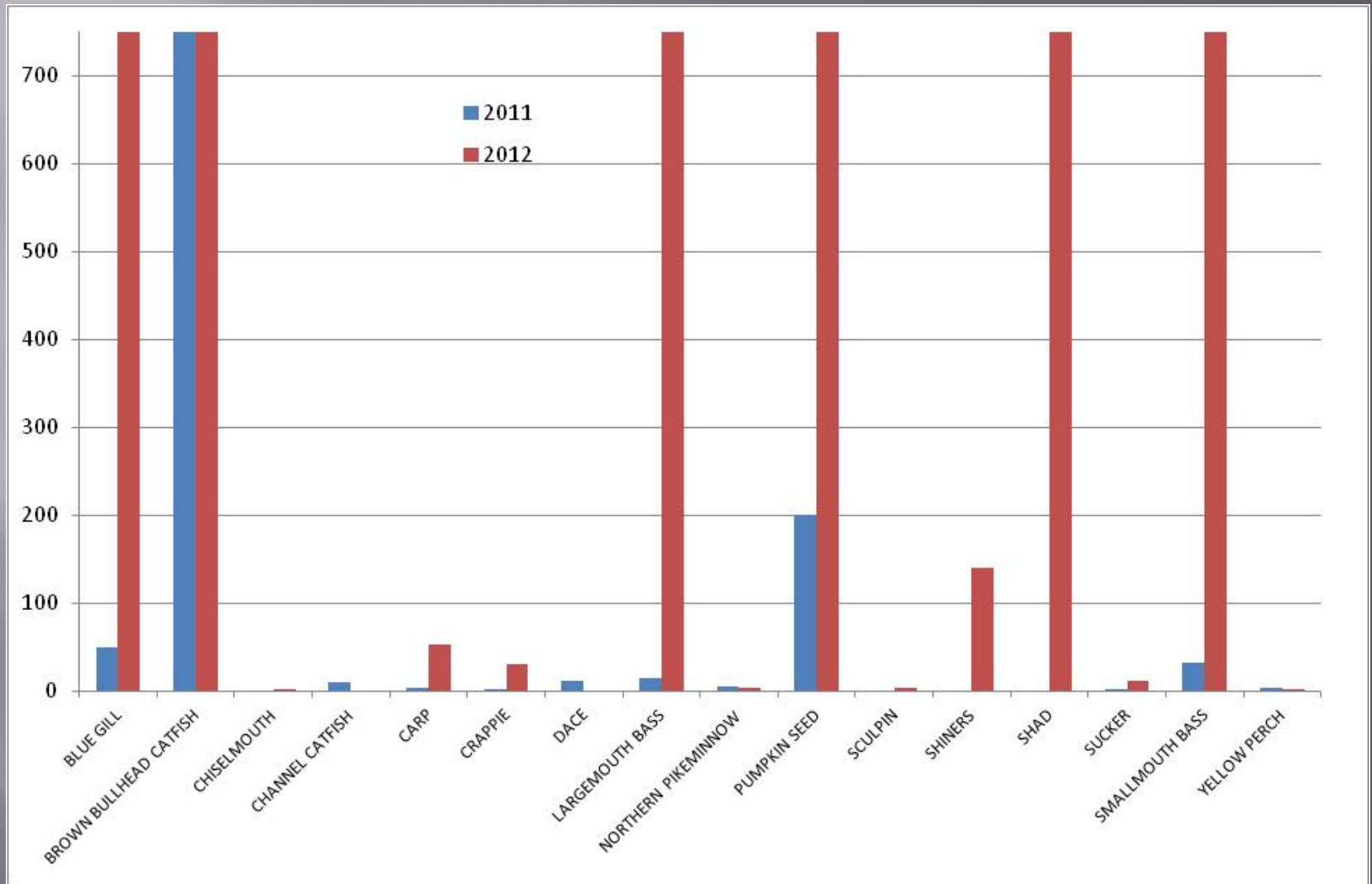
## *Fall Fish Species:*

### DELTA WEST OF CAUSEWAY

- BLUE GILL
- BROWN BULLHEAD CATFISH
- CHISELMOUTH
- CHANNEL CATFISH
- CARP
- CRAPPIE
- DACE
- LARGEMOUTH BASS
- NORTHERN PIKEMINNOW
- PUMPKIN SEED
- SCULPIN
- SHINERS
- SHAD
- SUCKER
- SMALLMOUTH BASS
- YELLOW PERCH

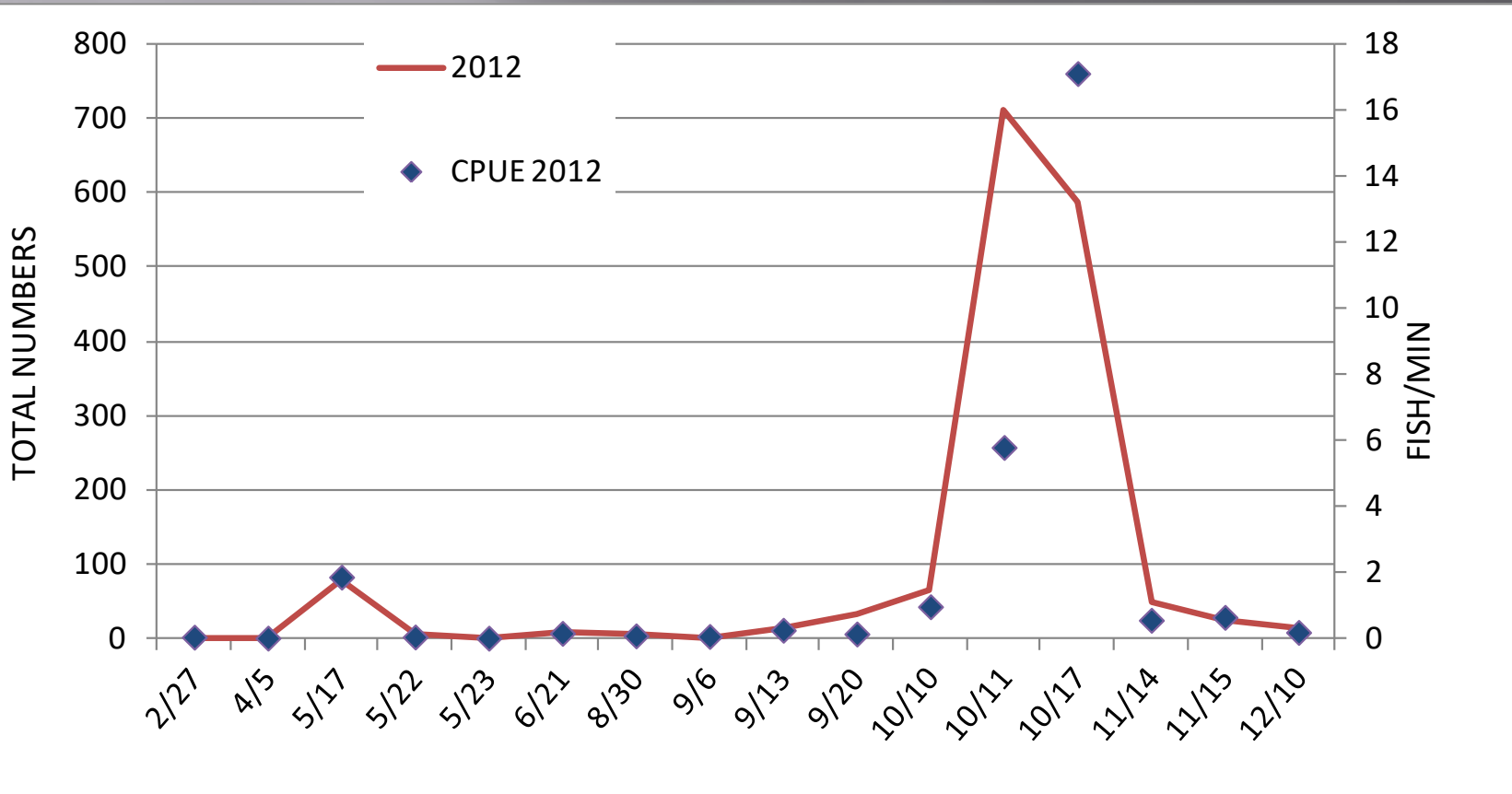


# Fall Fish Totals: Yakima Delta Front of Causeway



# Small Mouth Bass – Front of Causeway

Totals and Catch per Unit effort



# Fall Fish Totals

<b>DELTA FRONT OF CAUSEWAY</b>		
<b>BLUE GILL</b>	<b>50</b>	<b>2090</b>
<b>BROWN BULLHEAD CATFISH</b>	<b>1029</b>	<b>1600</b>
<b>CHISELMOUTH</b>		<b>2</b>
<b>CHANNEL CATFISH</b>	<b>10</b>	
<b>CARP</b>	<b>3</b>	<b>53</b>
<b>CRAPPIE</b>	<b>1</b>	<b>31</b>
<b>DACE</b>	<b>11</b>	
<b>LARGEMOUTH BASS</b>	<b>14</b>	<b>1182</b>
<b>NORTHERN PIKEMINNOW</b>	<b>5</b>	<b>3</b>
<b>PUMPKIN SEED</b>	<b>201</b>	<b>1499</b>
<b>SCULPIN</b>		<b>4</b>
<b>SHINERS</b>		<b>140</b>
<b>SHAD</b>		<b>823</b>
<b>SUCKER</b>	<b>1</b>	<b>12</b>
<b>SMALLMOUTH BASS</b>	<b>32</b>	<b>1485</b>
<b>YELLOW PERCH</b>	<b>4</b>	<b>1</b>

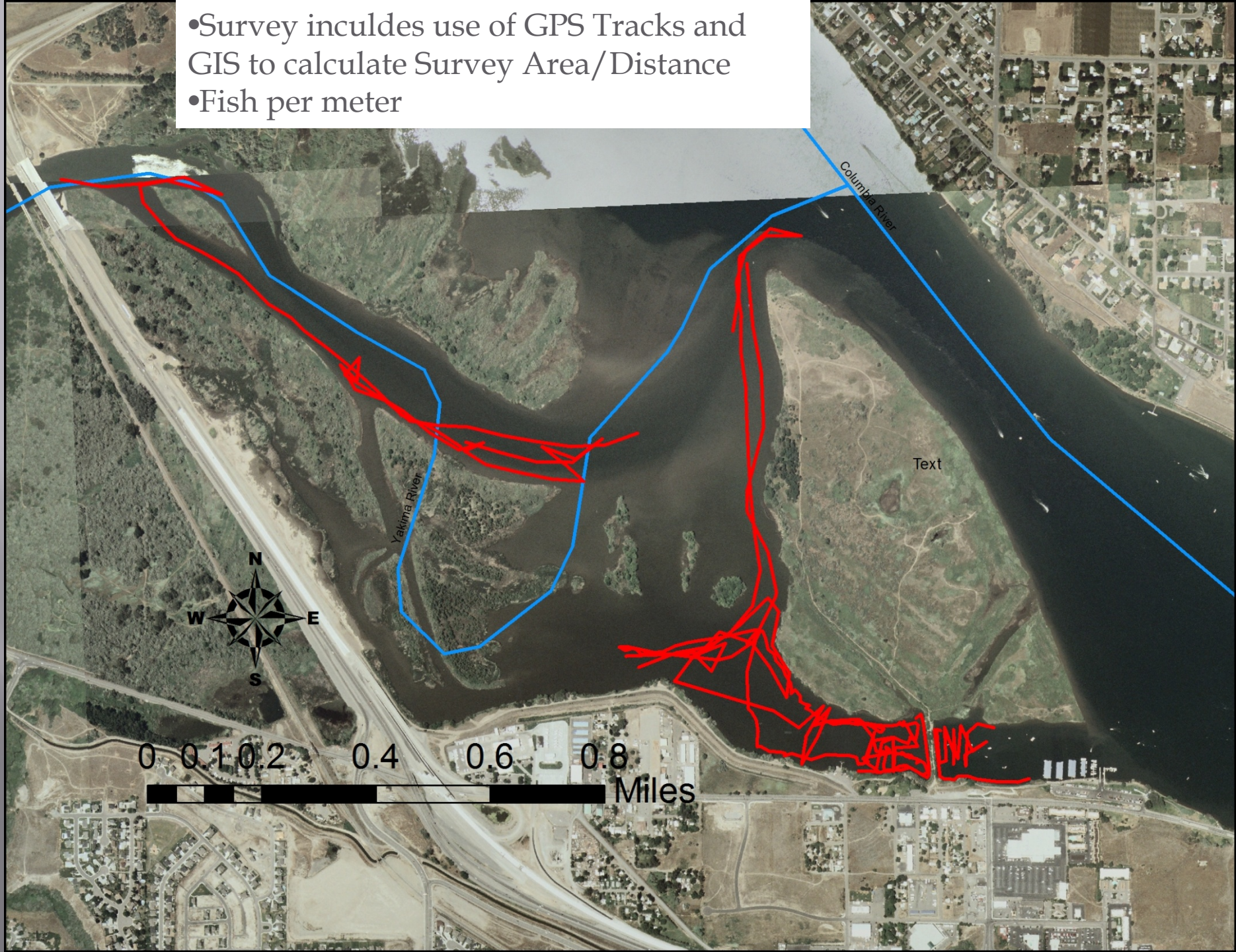




## Smallmouth Bass – Complete Survey Numbers

DATE	SPECIES	NUMBERS	ELECTRODE ON TIME	CPUE (min)	AVG survey	Fish/Meter
5/4/2011	SMB	1	51.07	0.02	3394.60	0.00
7/11/2011	SMB	6	51.53	0.12	3394.60	0.00
9/8/2011	SMB	23	46.33	0.50	3394.60	0.01
11/9/2011	SMB	1	43.37	0.02	3394.60	0.00
11/17/2011	SMB	8	38.57	0.21	3394.60	0.00
2/27/2012	SMB	2	34.50	0.06	3394.60	0.00
4/5/2012	SMB	1	34.10	0.03	3394.60	0.00
5/17/2012	SMB	80	42.68	1.87	3394.60	0.02
5/22/2012	SMB	5	78.65	0.06	3394.60	0.00
5/23/2012	SMB	2	73.57	0.03	3394.60	0.00
6/21/2012	SMB	9	51.87	0.17	3394.60	0.00
8/30/2012	SMB	6	61.32	0.10	3394.60	0.00
9/6/2012	SMB	1	12.53	0.08	3394.60	0.00
9/13/2012	SMB	15	56.07	0.27	3394.60	0.00
9/20/2012	SMB	32	207.90	0.15	3394.60	0.01
10/10/2012	SMB	65	66.40	0.98	3394.60	0.02
10/11/2012	SMB	711	122.63	<b>5.80</b>	404.05	<b>1.76</b>
10/17/2012	SMB	586	34.25	<b>17.11</b>	404.05	<b>1.45</b>
11/14/2012	SMB	50	87.83	0.57	3394.60	0.01
11/15/2012	SMB	25	37.98	0.66	3394.60	0.01
12/10/2012	SMB	13	64.37	0.20	3394.60	0.00
1/2/2013	SMB	1	49.05	0.02	3394.60	0.00
3/4/2013	SMB	5	57.82	0.09	3394.60	0.00
3/21/2013	SMB	1	62.52	0.02	3394.60	0.00

- Survey includes use of GPS Tracks and GIS to calculate Survey Area/Distance
- Fish per meter



## Largemouth Bass- Complete Survey Numbers

LOCATION	Date	SPECIES	NUMBERS	ELECTRODE MINUTES	CPUE
DELTA FRONT OF CAUSEWAY	7/11/2011	LMB	3	51.53	0.058219
DELTA FRONT OF CAUSEWAY	9/8/2011	LMB	3	46.33	0.064753
DELTA FRONT OF CAUSEWAY	11/9/2011	LMB	4	43.37	0.09223
DELTA FRONT OF CAUSEWAY	11/17/2011	LMB	7	38.57	0.181488
DELTA FRONT OF CAUSEWAY	4/5/2012	LMB	1	34.1	0.029326
DELTA FRONT OF CAUSEWAY	9/13/2012	LMB	5	56.07	0.089174
DELTA FRONT OF CAUSEWAY	10/10/2012	LMB	32	66.4	0.481928
DELTA FRONT OF CAUSEWAY	<b>10/11/2012</b>	LMB	<b>778</b>	122.63	6.344288
DELTA FRONT OF CAUSEWAY	<b>10/17/2012</b>	LMB	<b>205</b>	34.25	5.985401
DELTA FRONT OF CAUSEWAY	11/14/2012	LMB	60	87.83	0.683138
DELTA FRONT OF CAUSEWAY	11/15/2012	LMB	75	37.98	1.974724
DELTA FRONT OF CAUSEWAY	3/4/2013	LMB	1	57.82	0.017295
DELTA FRONT OF CAUSEWAY	3/21/2013	LMB	1	62.52	0.015995





## Brown Bullhead – Complete Survey Numbers

LOCATION	Date	SPECIES	NUMBERS	ELECTRODE MINUTES	CPUE
DELTA FRONT OF CAUSEWAY	9/8/2011	BRCT	1000	46.33	21.58429
DELTA FRONT OF CAUSEWAY	11/9/2011	BRCT	1	43.37	0.023057
DELTA FRONT OF CAUSEWAY	11/17/2011	BRCT	5	38.57	0.129634
DELTA FRONT OF CAUSEWAY	11/30/2011	BRCT	23	38.3	0.600522
DELTA FRONT OF CAUSEWAY	8/30/2012	BRCT	100	61.32	1.630789
DELTA FRONT OF CAUSEWAY	9/6/2012	BRCT	15	12.53	1.197127
DELTA FRONT OF CAUSEWAY	9/13/2012	BRCT	2	56.07	0.03567
DELTA FRONT OF CAUSEWAY	10/11/2012	BRCT	1510	122.63	12.31346
DELTA FRONT OF CAUSEWAY	11/14/2012	BRCT	20	87.83	0.227713
DELTA FRONT OF CAUSEWAY	11/15/2012	BRCT	47	37.98	1.237493
DELTA FRONT OF CAUSEWAY	12/10/2012	BRCT	34	64.37	0.528196

## Channel Catfish– Complete Survey Numbers

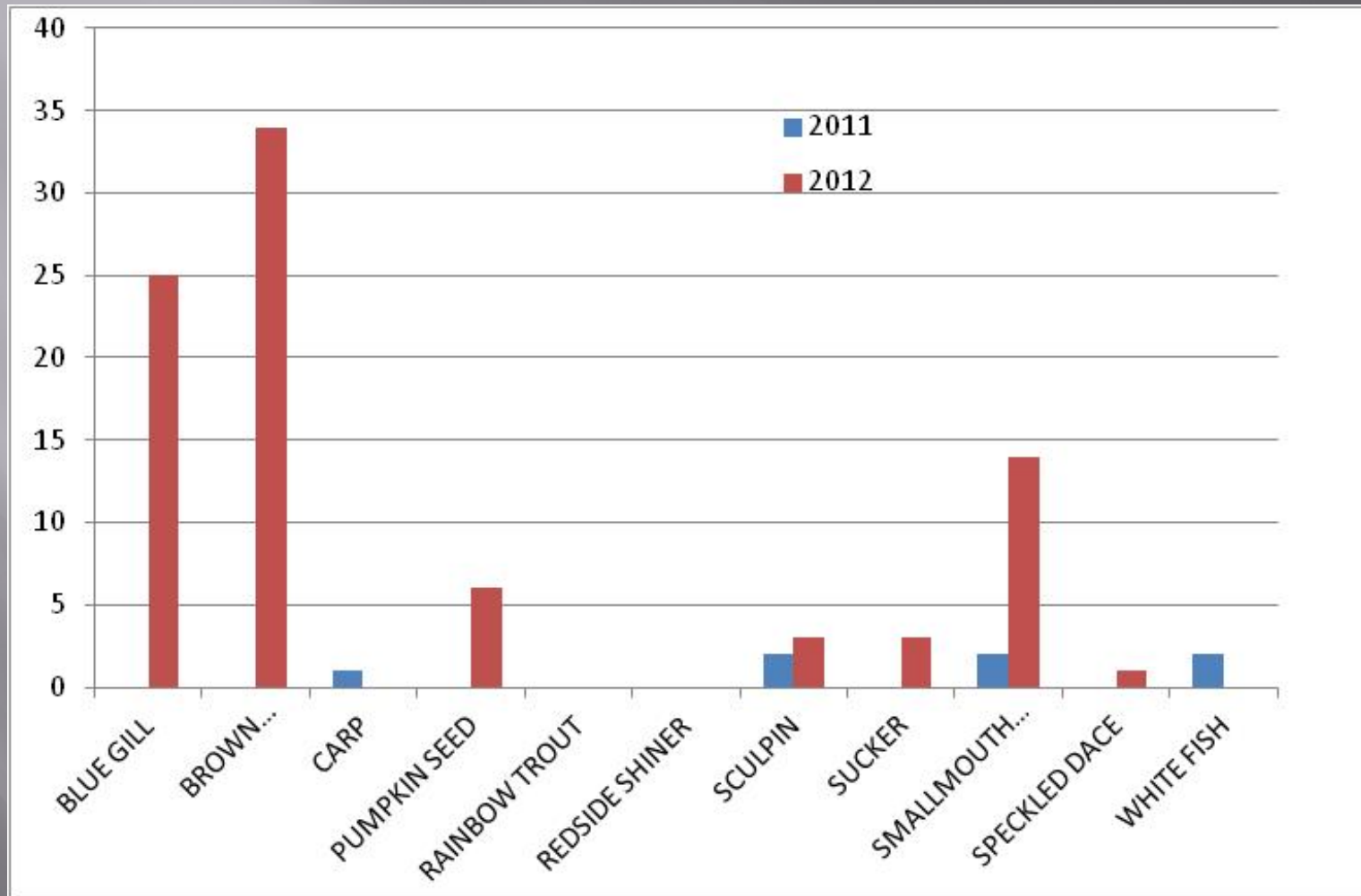
LOCATION	Date	SPECIES	NUMBERS	ELECTRODE MINUTES	CPUE
DELTA FRONT OF CAUSEWAY	5/4/2011	CHCT	1	51.07	0.019581
DELTA FRONT OF CAUSEWAY	5/12/2011	CHCT	1	63.35	0.015785
DELTA FRONT OF CAUSEWAY	7/11/2011	CHCT	2	51.53	0.038812
DELTA FRONT OF CAUSEWAY	9/8/2011	CHCT	10	46.33	0.215843
DELTA FRONT OF CAUSEWAY	5/17/2012	CHCT	26	42.68	0.609185
DELTA FRONT OF CAUSEWAY	6/21/2012	CHCT	1	51.87	0.019279

## *Winter Fish Species:*

### DELTA FRONT OF CAUSEWAY

- BLUE GILL
- BROWN BULLHEAD CATFISH
- CARP
- PUMPKIN SEED
- RAINBOW TROUT
- REDSIDE SHINER
- SCULPIN
- SUCKER
- SMALLMOUTH BASS
- SPECKLED DACE
- WHITE FISH

## Winter Fish Totals: Yakima Delta West Causeway



## Yakima Delta East Causeway Fish Species (Columbia River Side)

- BLUE GILL
- BROWN BULLHEAD CATFISH
- CARP
- CHANNEL CATFISH
- COHO
- DACE
- LARGEMOUTH BASS
- NORTHERN PIKEMINNOW
- PUMPKIN SEED
- SCULPIN
- SHAD
- SHINERS
- SMALLMOUTH BASS
- SPRING CHINOOK
- STEELHEAD
- SUCKER
- YELLOW PERCH

## Largemouth Bass- Complete Survey Numbers

- Only surveyed fish that utilizes the Columbia River side of the causeway
- Juveniles are found in high numbers in late fall utilizing large rocks as rearing area
- Overwinters in these rearing areas

<b>LOCATION</b>	<b>Date</b>	<b>SPECIES</b>	<b>NUMBERS</b>	<b>ELECTRODE MINUTES</b>	<b>CPUE</b>
DELTA BEHIND CAUSEWAY	11/9/2011	LMB	17	26.67	0.63742
DELTA BEHIND CAUSEWAY	11/17/2011	LMB	27	26.55	1.016949
DELTA BEHIND CAUSEWAY	11/30/2011	LMB	1	18.13	0.055157
DELTA BEHIND CAUSEWAY	9/13/2012	LMB	16	16.42	0.974421
DELTA BEHIND CAUSEWAY	11/15/2012	LMB	364	70.68	5.149972
DELTA BEHIND CAUSEWAY	12/11/2012	LMB	51	75.4	0.676393
DELTA BEHIND CAUSEWAY	1/2/2013	LMB	2	28.72	0.069638

## Conclusions:

- Species Distribution, both Temporal and Spatial, varies by species
- Northern Pikeminnow dominate “upper river”
- Smallmouth Bass dominate lower river and delta
- Yakima River Delta over-run by exotic predatory fish, a hazard to out-migrating juvenile salmon