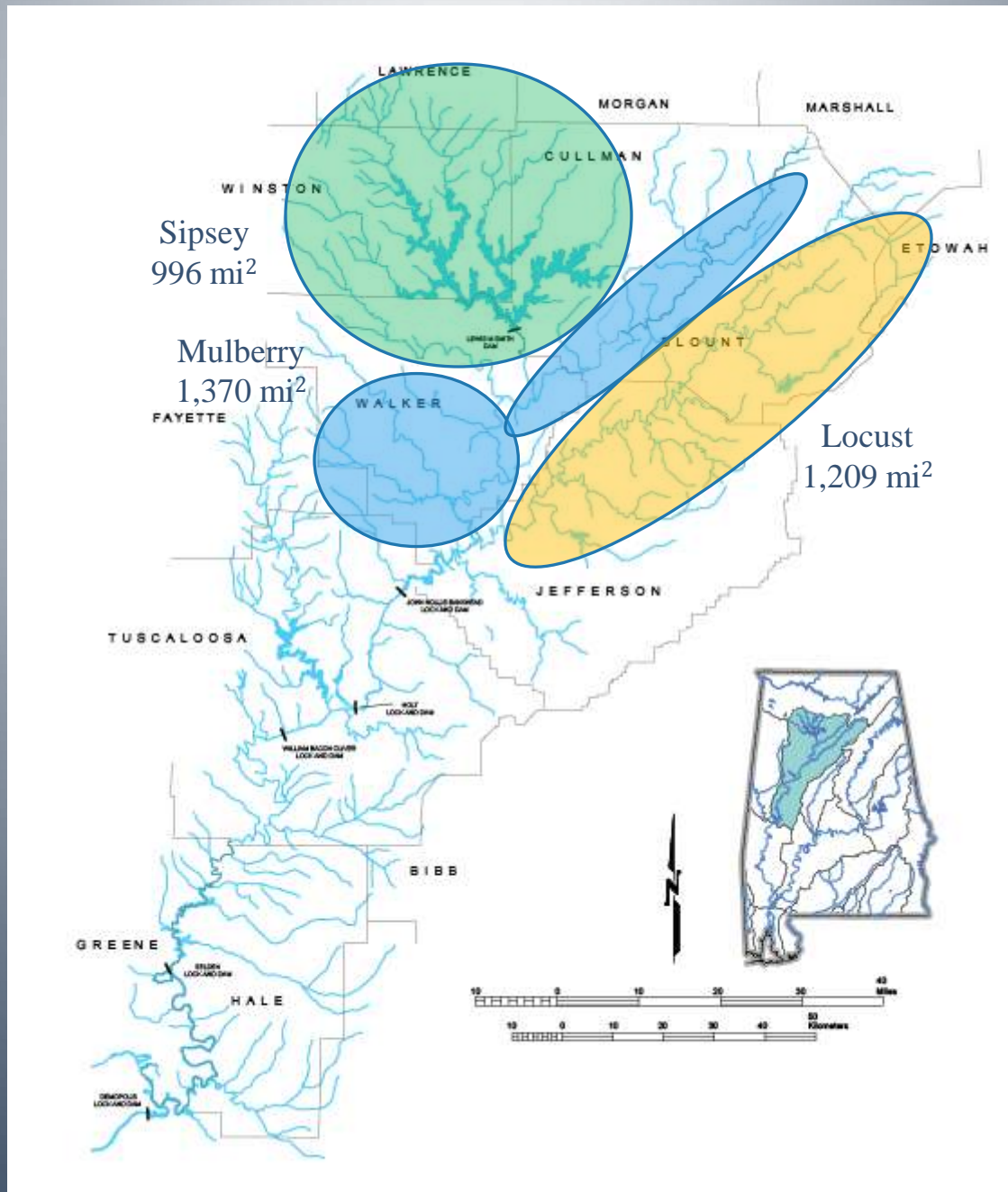


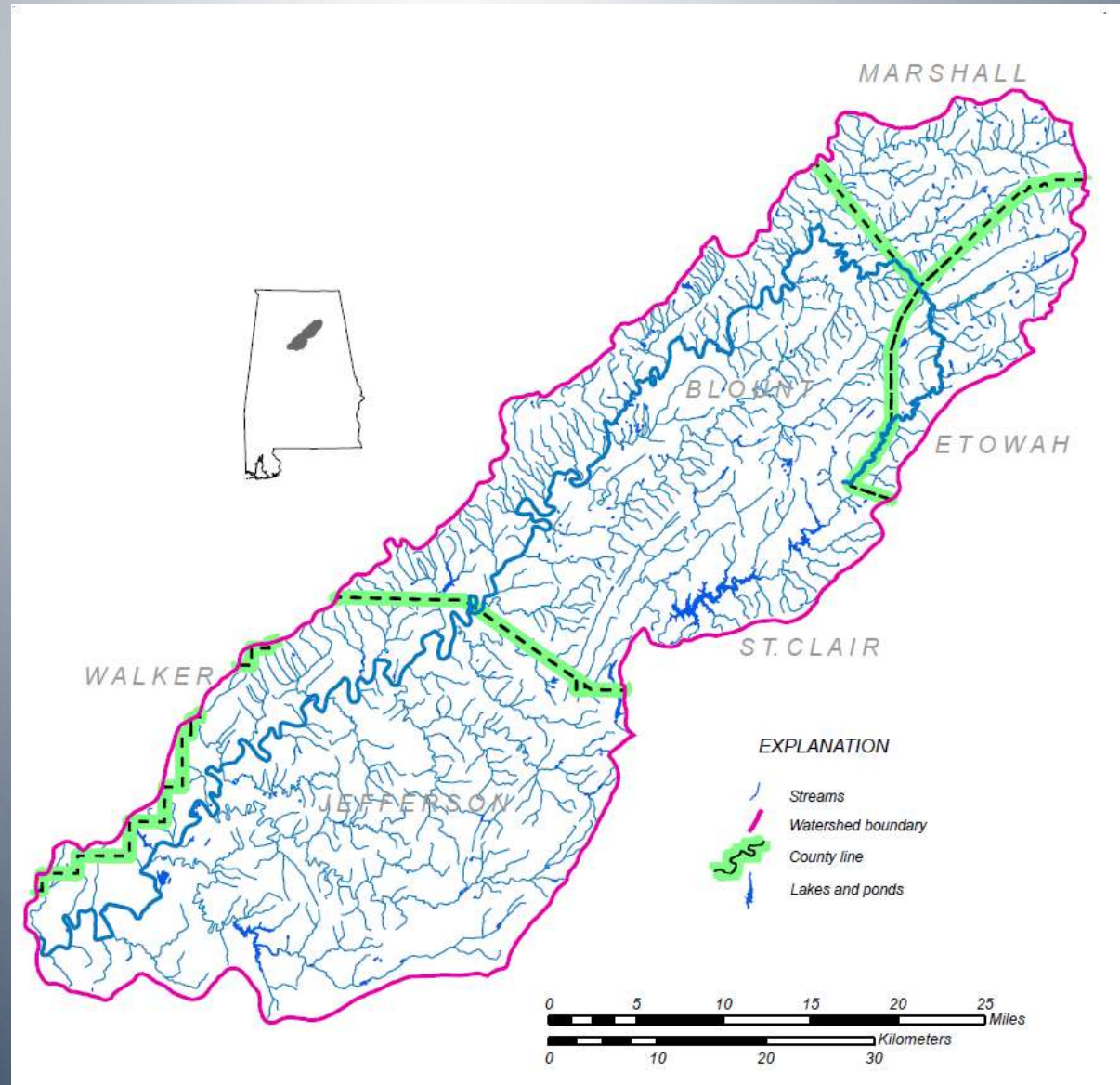
*40 Years of Biological Sampling in the
Locust Fork Watershed
—What Have We Learned—*



The Black Warrior River System

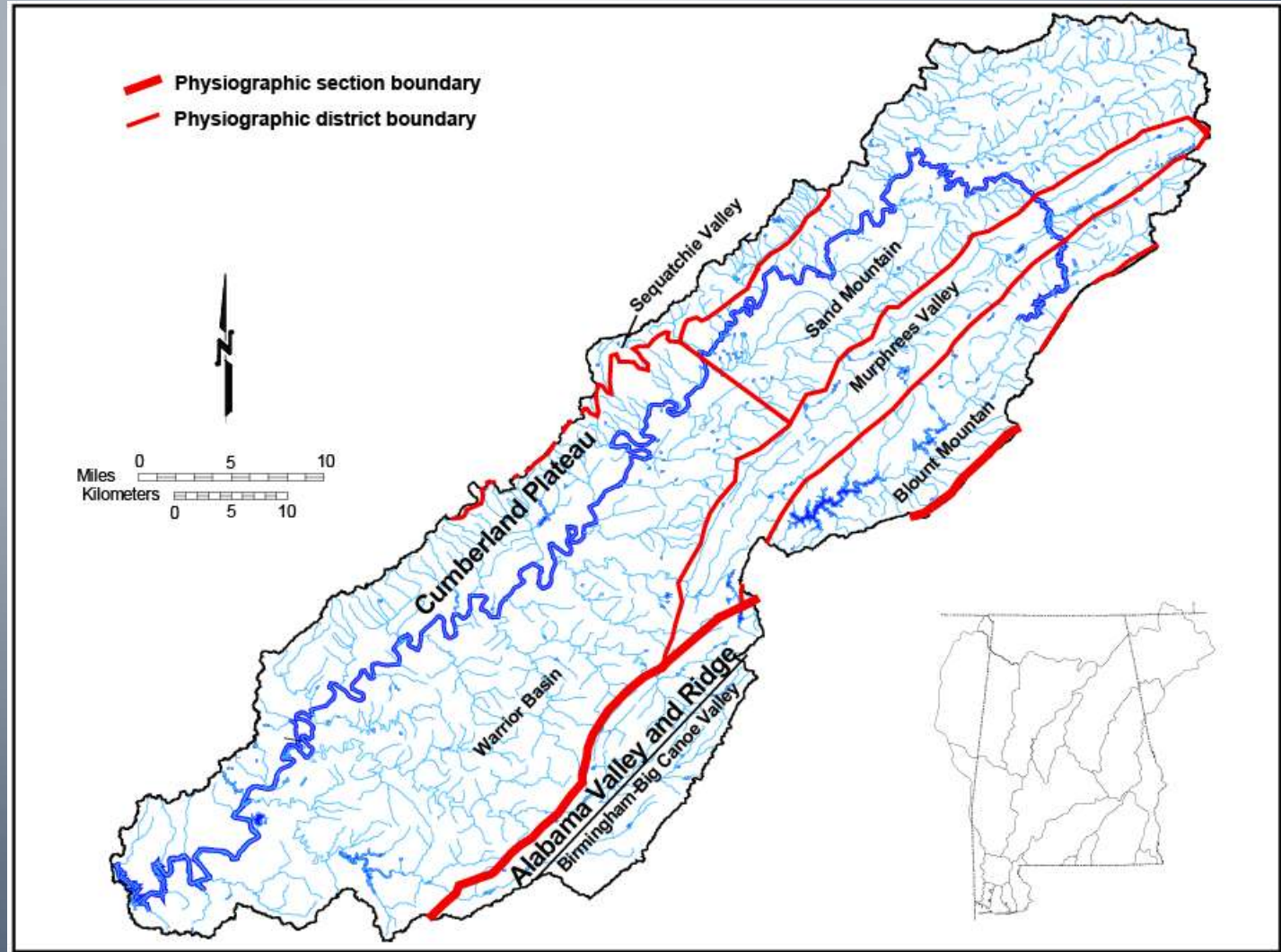


The Locust Fork Watershed



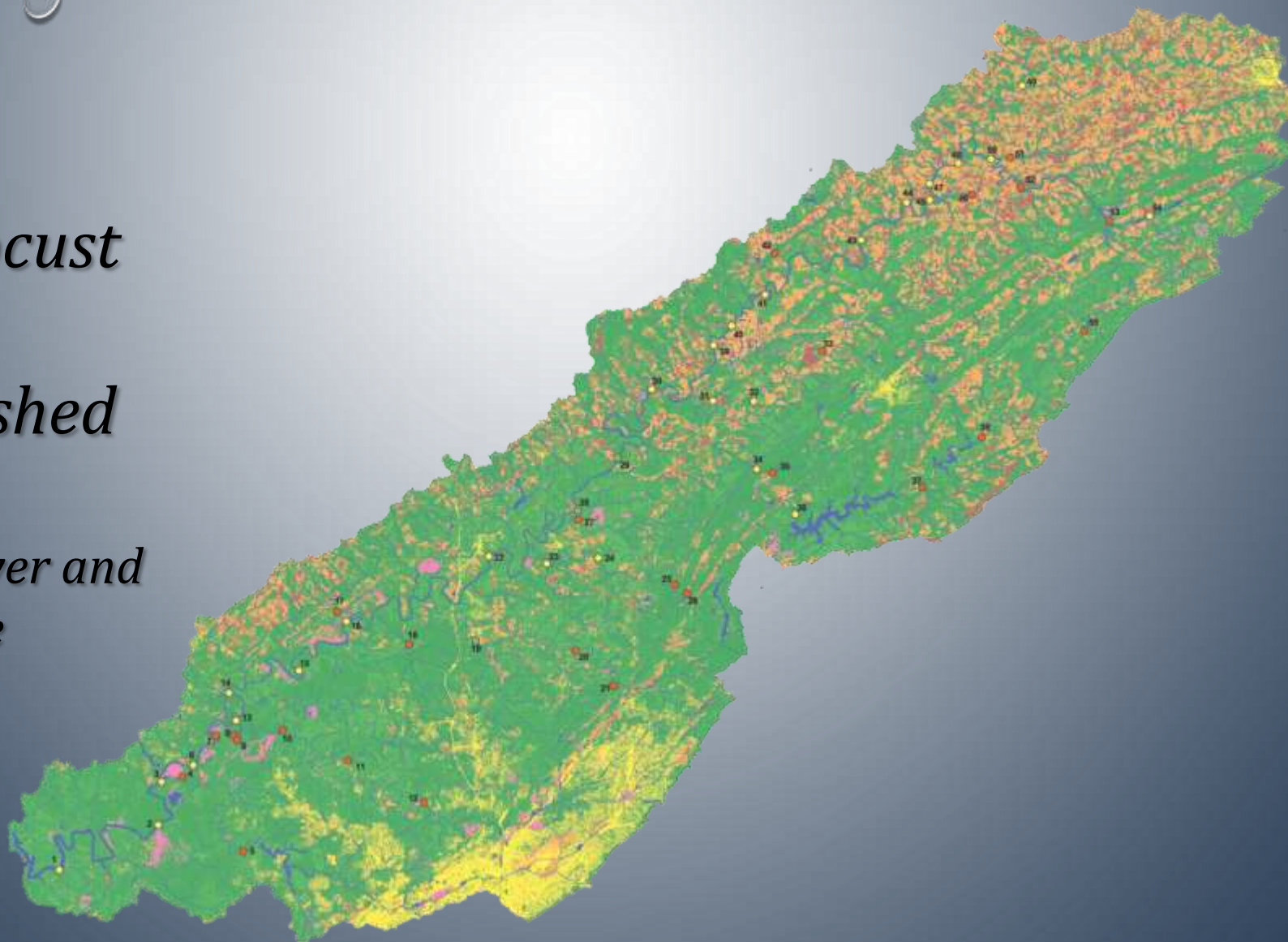
The Locust Fork Watershed

Physiography



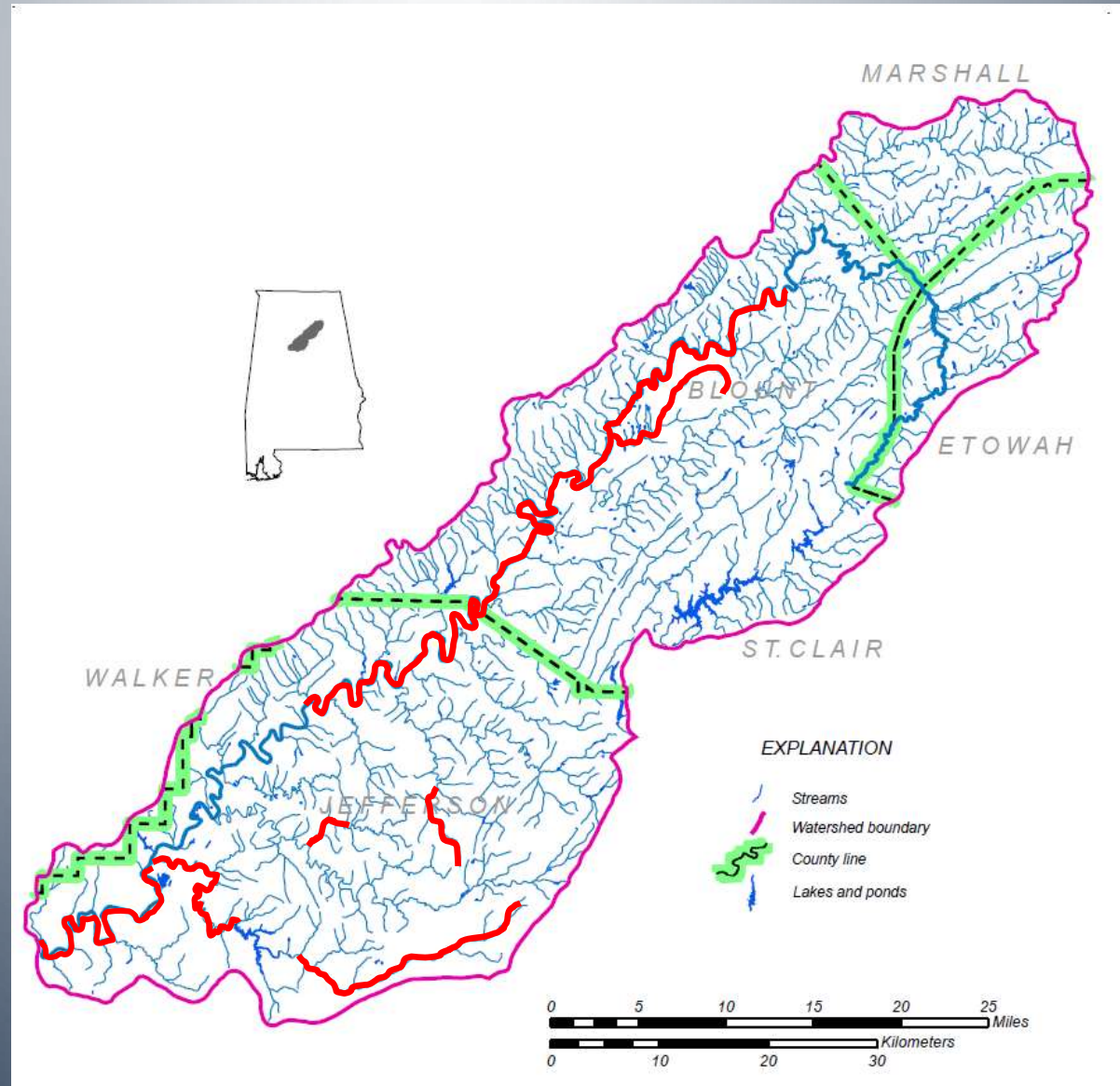
The Locust Fork Watershed

*Land Cover and
Land Use*



The Locust Fork Watershed

303(d)



The Locust Fork Watershed 303(d)

Locust Fork	R	Black Warrior	Jefferson	Public Water Supply Swimming Fish & Wildlife	Nutrients	Industrial Municipal Urban runoff/storm sewers	2005-2011	6.88 miles	Junction of Locust and Mulberry Forks / Jefferson County Hwy 61
Locust Fork	R	Black Warrior	Jefferson	Fish & Wildlife	Nutrients	Industrial Municipal Urban runoff/storm sewers	2005-2011	13.06 miles	Jefferson County Hwy 61 / Village Creek
Locust Fork	R	Black Warrior	Blount Jefferson	Fish & Wildlife	Nutrients	Agriculture Surface mining-abandoned	1998	14.25 miles	Jefferson County Road 77 / US Highway 31
Locust Fork	R	Black Warrior	Blount Jefferson	Fish & Wildlife	Siltation (habitat alteration)	Agriculture Surface mining-abandoned	1998	14.25 miles	Jefferson County Road 77 / US Highway 31
Locust Fork	R	Black Warrior	Blount Jefferson	Public Water Supply Fish & Wildlife	Nutrients	Agriculture Surface mining-abandoned	1998	14.86 miles	US Highway 31 / County road between Hayden and County Line
Locust Fork	R	Black Warrior	Blount Jefferson	Public Water Supply Fish & Wildlife	Siltation (habitat alteration)	Agriculture Surface mining-abandoned	1998	14.86 miles	US Highway 31 / County road between Hayden and County Line
Locust Fork	R	Black Warrior	Blount Jefferson	Fish & Wildlife	Nutrients	Agriculture Surface mining-abandoned	1998	18.15 miles	County road between Hayden and County Line / Little Warrior River
Locust Fork	R	Black Warrior	Blount Jefferson	Fish & Wildlife	Siltation (habitat alteration)	Agriculture Surface mining-abandoned	1998	18.15 miles	County road between Hayden and County Line / Little Warrior River
Locust Fork	R	Black Warrior	Blount	Fish & Wildlife	Siltation (habitat alteration)	Agriculture Surface mining-abandoned	1987 1998	27.18 miles	Little Warrior River / Blount County Road 30
Dry Creek	R	Black Warrior	Blount	Fish & Wildlife	Nutrients Organic enrichment (CBOD, NBOD)	Municipal Pasture grazing	1988 1991	12.00 miles	Locust Fork / its source
Black Creek	R	Black Warrior	Jefferson	Fish & Wildlife	pH	Surface mining-abandoned	2012	6.36 miles	Cunningham Creek / its source
Newfound Creek	R	Black Warrior	Jefferson	Fish & Wildlife	Siltation (habitat alteration)	Urban runoff/storm sewers	1986 2002	2.76 miles	Fivemile Creek / Impoundment
Village Creek	R	Black Warrior	Jefferson	Fish & Wildlife	Nutrients	Industrial Municipal Urban runoff/storm sewers	2005-2011	17.9 miles	Locust Fork / Bayview Lake dam
Village Creek	R	Black Warrior	Jefferson	Limited Warmwater Fishery	Pathogens	Collection system failure Urban runoff/storm sewers	2000 2001 2002 2004	12.60 miles	Second Creek / Woodlawn Bridge
Village Creek	R	Black Warrior	Jefferson	Limited Warmwater Fishery	Pesticides (Dieldrin)	Urban runoff/storm sewers	2000 2001 2002 2004	12.60 miles	Second Creek / Woodlawn Bridge
Village Creek	R	Black Warrior	Jefferson	Limited Warmwater Fishery	Pathogens	Collection system failure Urban runoff/storm sewers	2000 2001 2002 2004	4.04 miles	Woodlawn Bridge / Its source
Village Creek	R	Black Warrior	Jefferson	Limited Warmwater Fishery	Pesticides (Dieldrin)	Urban runoff/storm sewers	2000 2001 2002 2004	4.04 miles	Woodlawn Bridge / its source



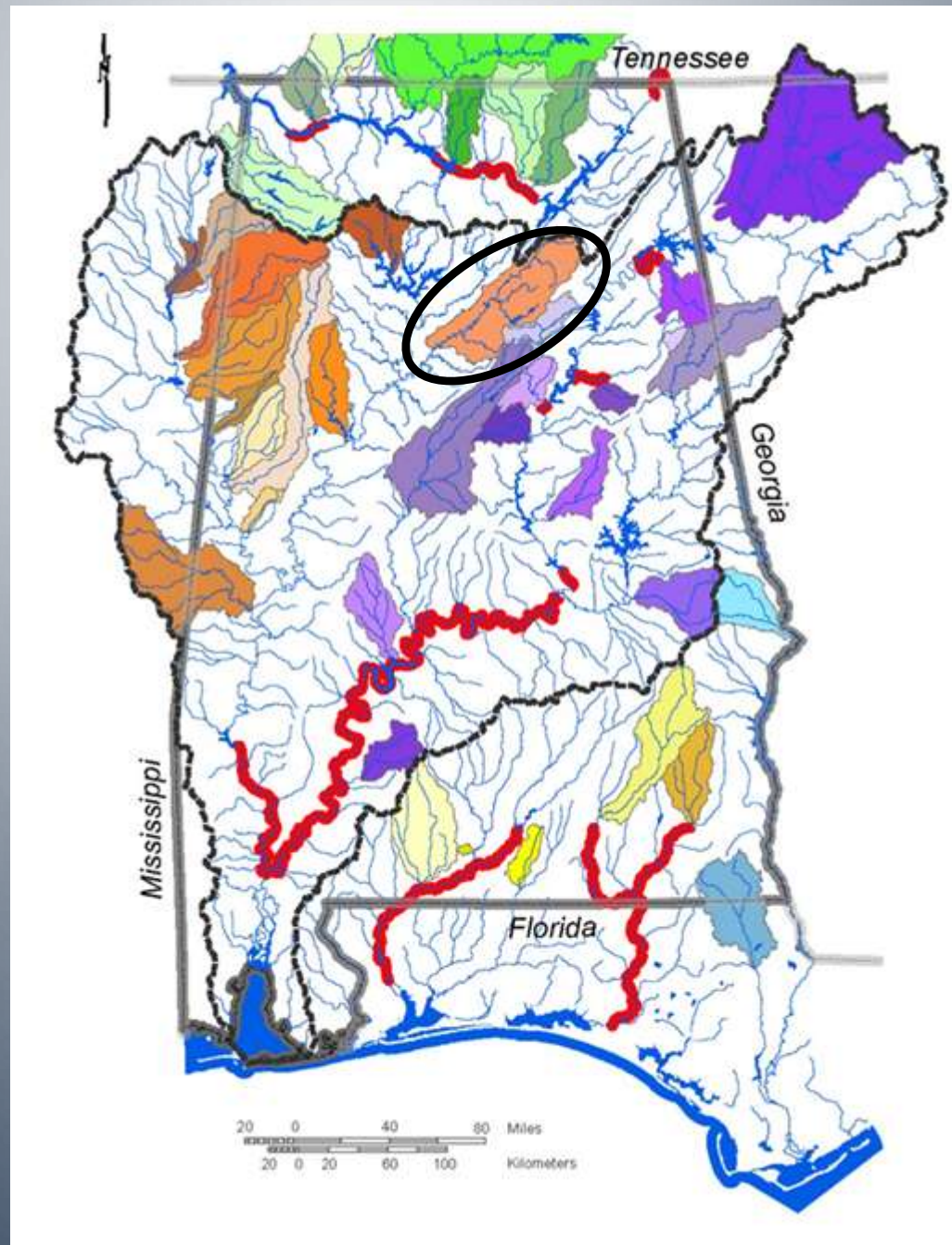
Nonpoint pollution potential

Subwatersheds of 03160111	Overall NPS impairment potential	NPS impairment potential ¹							
		Animals	Aquaculture	Row crop	Pasture	Mining	Forestry	Sediment	Urban
010 Upper Locust Fork	L	M	L	L	M	L	L	L	L
020 Bristow Creek	L	L	L	M	M	L	L	L	L
030 Clear Creek	M	M	L	H	M	L	L	L	H
040 Slab Creek	M	M	L	H	M	L	L	L	M
050 Middle Locust Fork	M	M	L	M	M	M	L	L	L
060 Calvert Prong	L	L	L	M	M	L	L	L	M
070 Blackburn Fork	L	L	L	M	M	L	L	L	L
080 Sugar Creek	L	L	L	M	M	M	L	L	L
090 Gurley Creek	L	L	L	L	L	L	M	M	L
100 Hogeland Creek	L	L	L	M	M	L	M	L	H
110 Turkey Creek	L	L	L	L	L	L	M	M	M
120 Cane Creek	M	L	L	M	L	M	M	M	L
130 Five Mile Creek	L	L	L	L	L	L	L	M	H
140 Village Creek	L	L	L	L	L	L	L	H	M
150 Lower Locust Fork	M	L	L	L	L	M	H	M	L

¹ - L-low potential, M-moderate potential, H-high potential

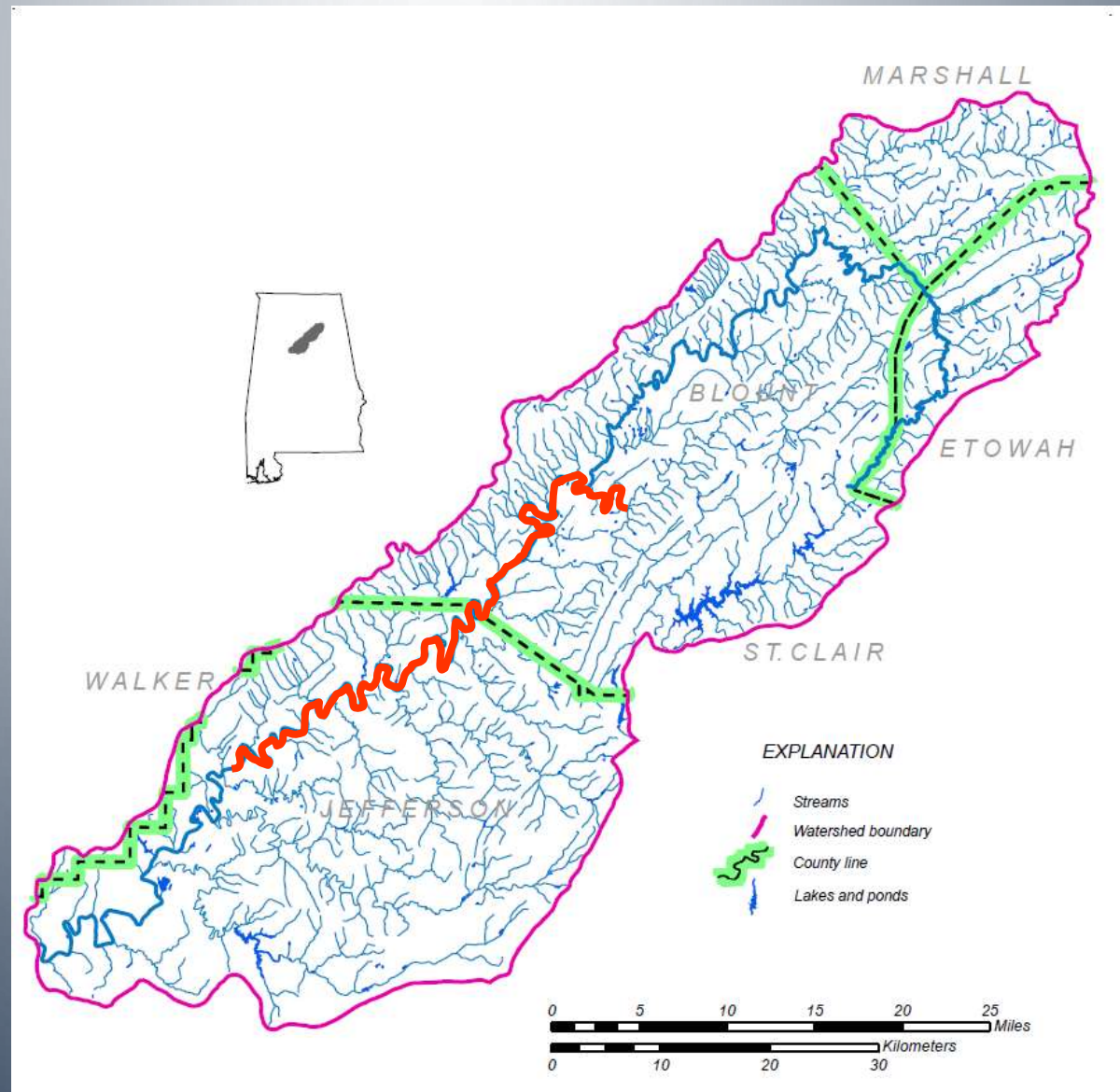


*Strategic
Habitat Units
--SHUs--*



The Locust Fork Watershed

SHU
Critical habitat



Aquatic Species of Conservation Concern

MUSSELS

Orangenacre Mucket (P2,T)
Alabama Spike (P1)
Delicate Spike (P2)
Upland Combshell (Ex,E)
Alabama Moccasinshell (P1,T)
Dark Pigtoe (P1,E)
Triangular Kidneyshell (P1,E)

SNAILS

Hispid Elimia (P2)
Gladiator Elimia (P2)
Black Mudalia (P2, C)
Plicate Rocksnail (P1, E)

FISHES

Vermillion Darter (P1,E)
Watercress Darter (P1,E)
Rush Darter (P1,E)
Locust Fork Darter (P2)
Cahaba Shiner (P1,E)
Coal Darter (P2)

HERPTILES

Black Warrior Waterdog (P1,C)
Alligator Snapping Turtle (P2)
Flattened Muck Turtle (P1,T)



Record of Fish Survey Investigations

<i>Barclay (1971)</i>	1969-70
<i>Barclay and Howell (1973)</i>	1969-70
<i>Shepard and others (2004)</i>	1997-98
<i>O'Neil and Shepard (2016)</i>	2010-11

Total List – 92 species



*Barclay
and
Howell
(1973)*

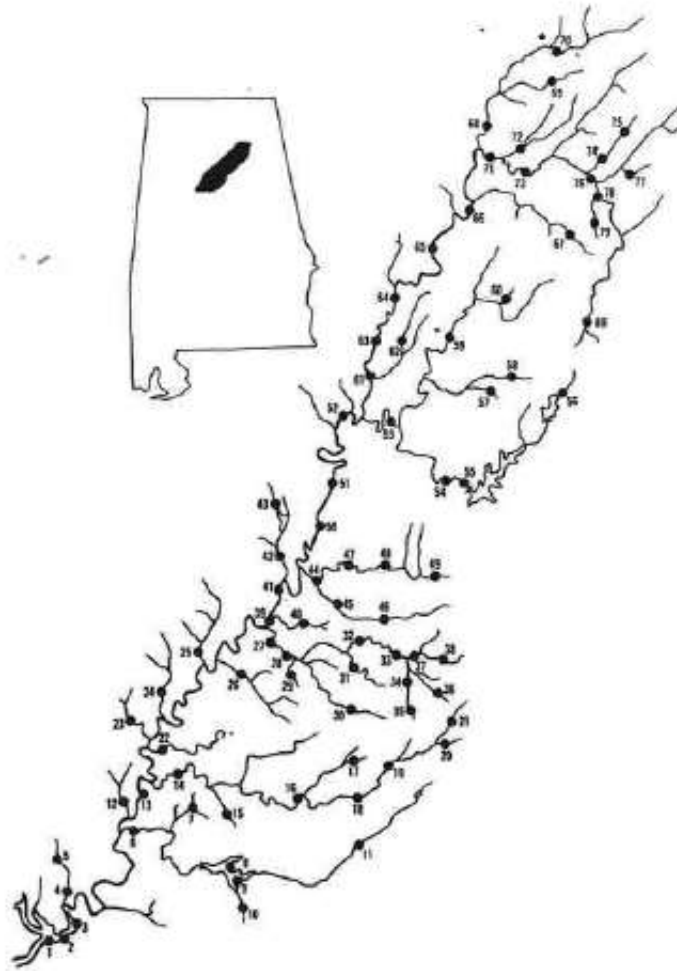


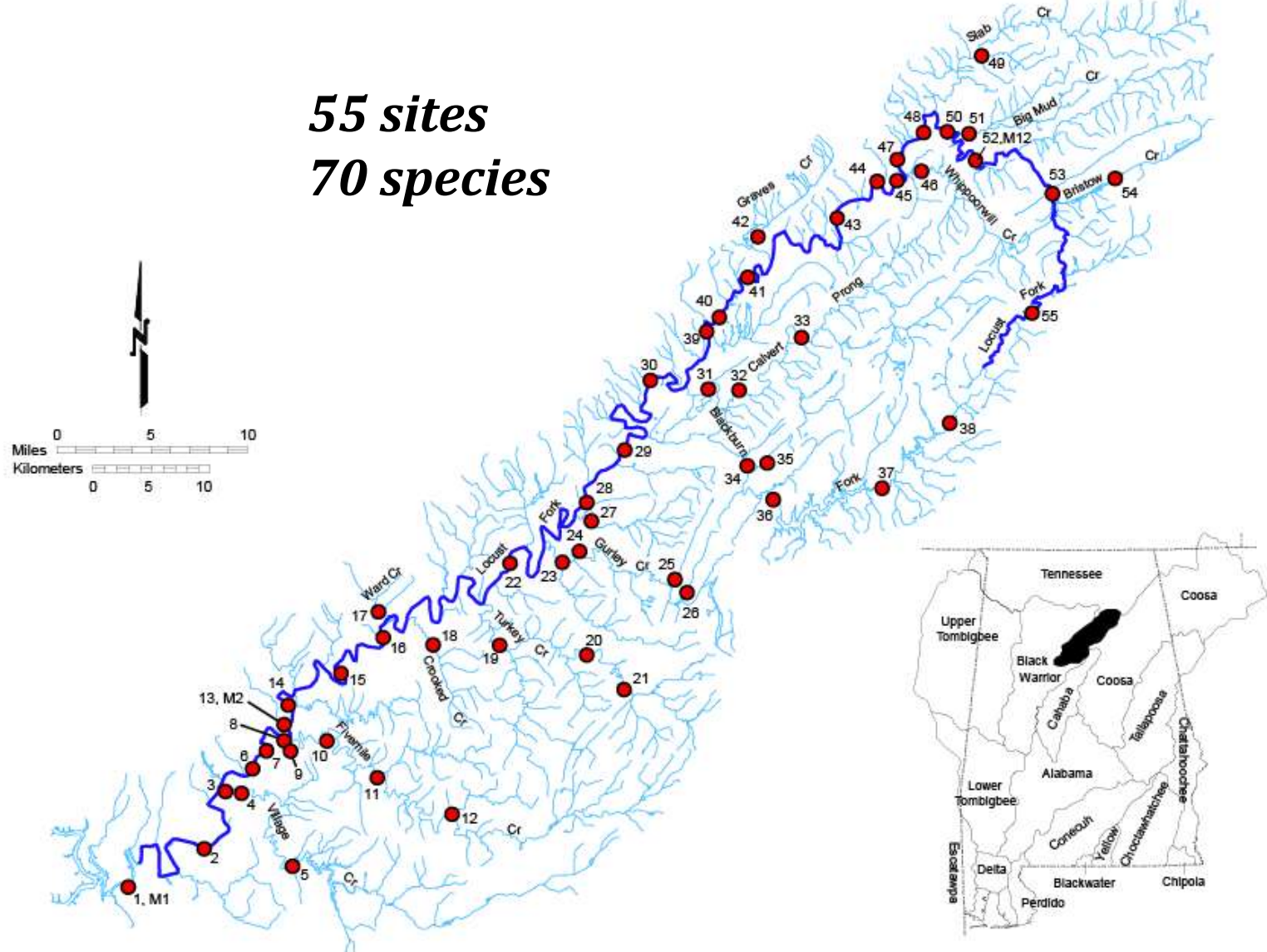
FIGURE 1. Locations of collecting stations in the Locust Fork drainage.

*80 sites
74 species*

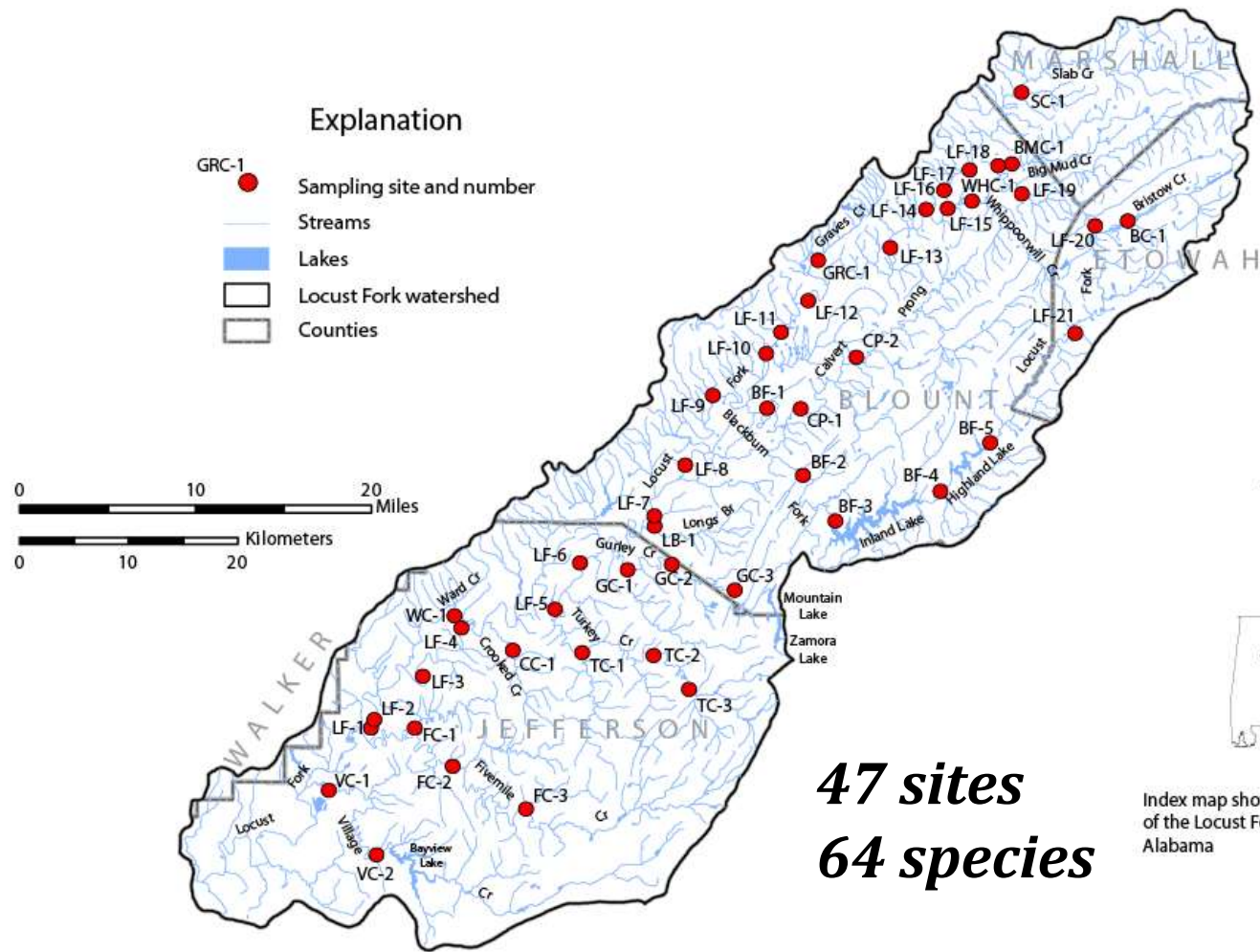


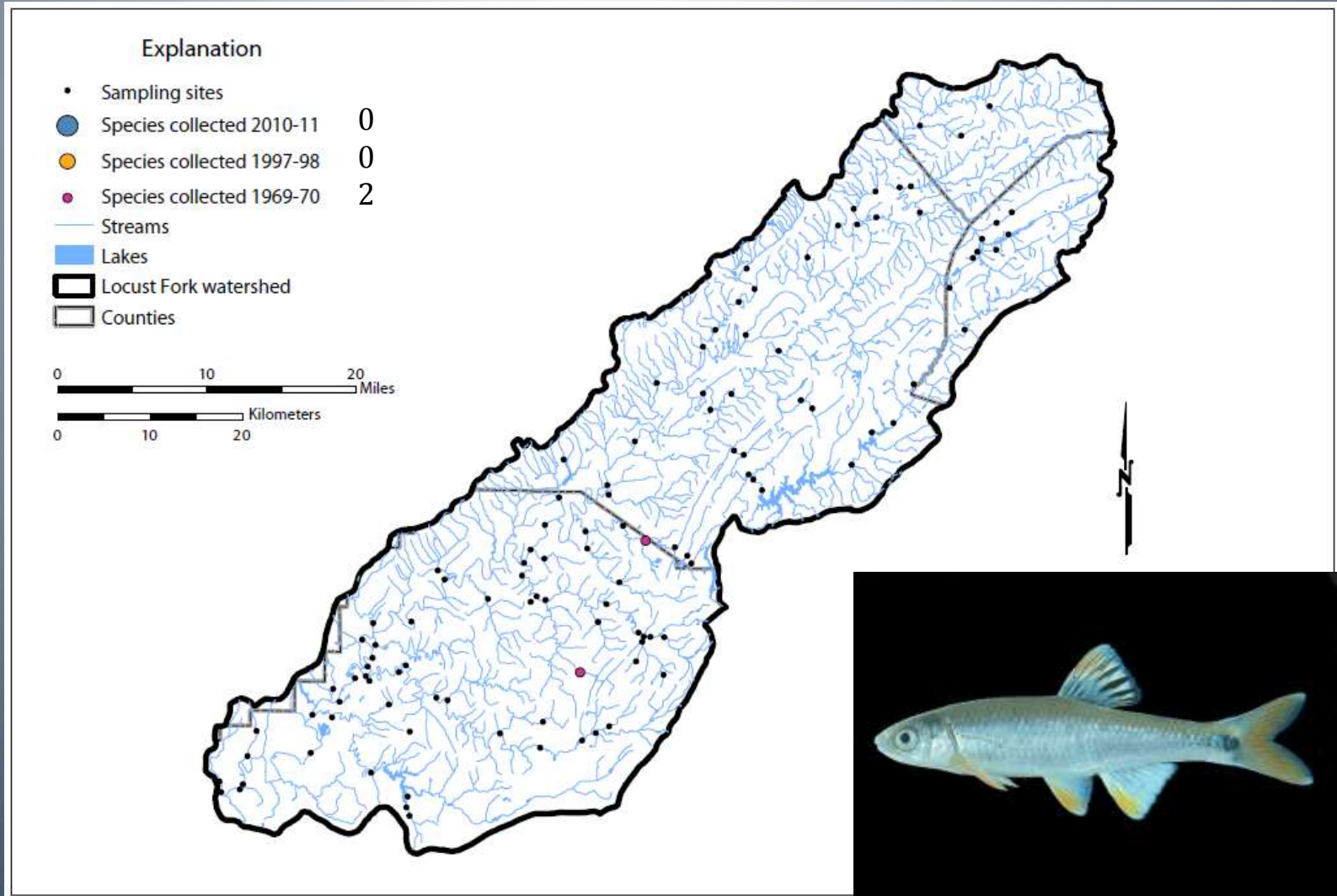
*Shepard
and
others
(2004)*

55 sites
70 species



O'Neil and Shepard (2016)



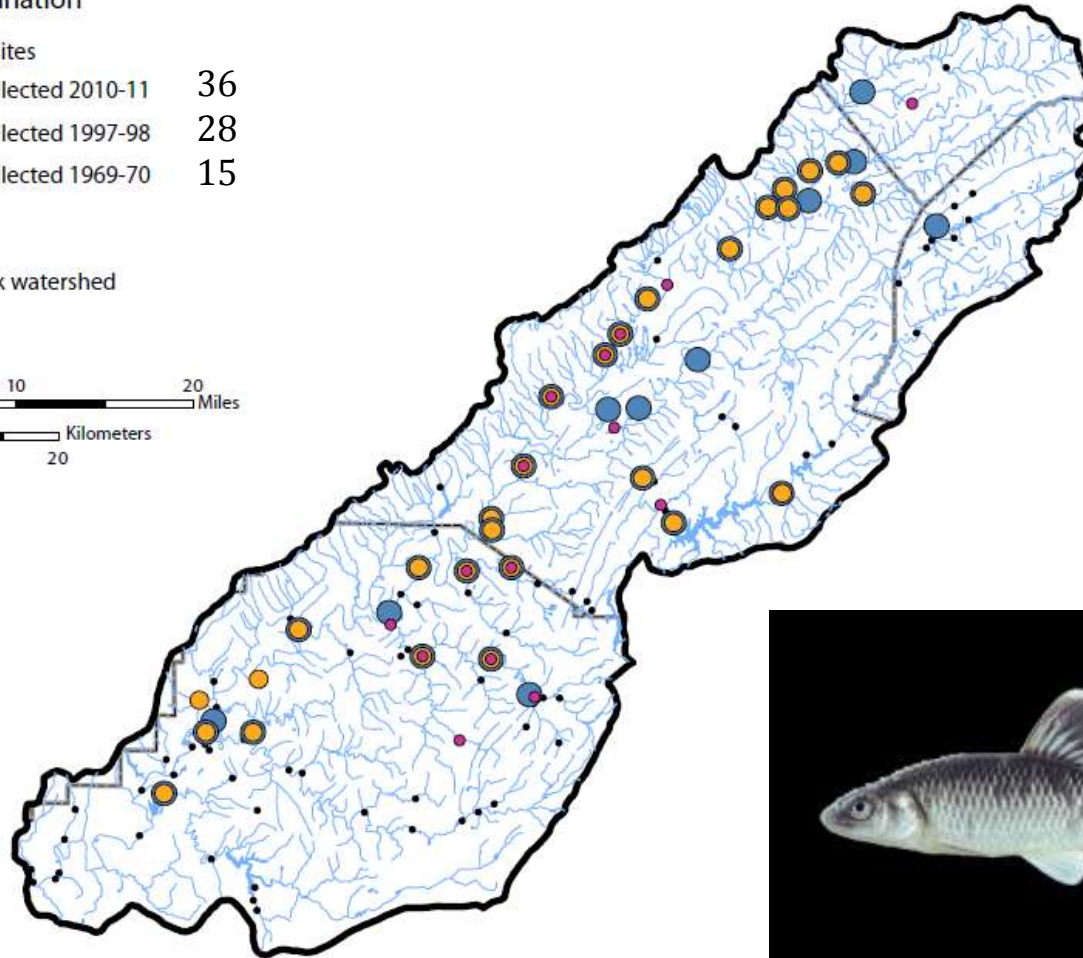
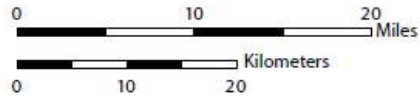


Tricolor Shiner, *Cyprinella trichroistia*,



Explanation

- Sampling sites
- Species collected 2010-11 36
- Species collected 1997-98 28
- Species collected 1969-70 15
- Streams
- Lakes
- ▭ Locust Fork watershed
- ▭ Counties

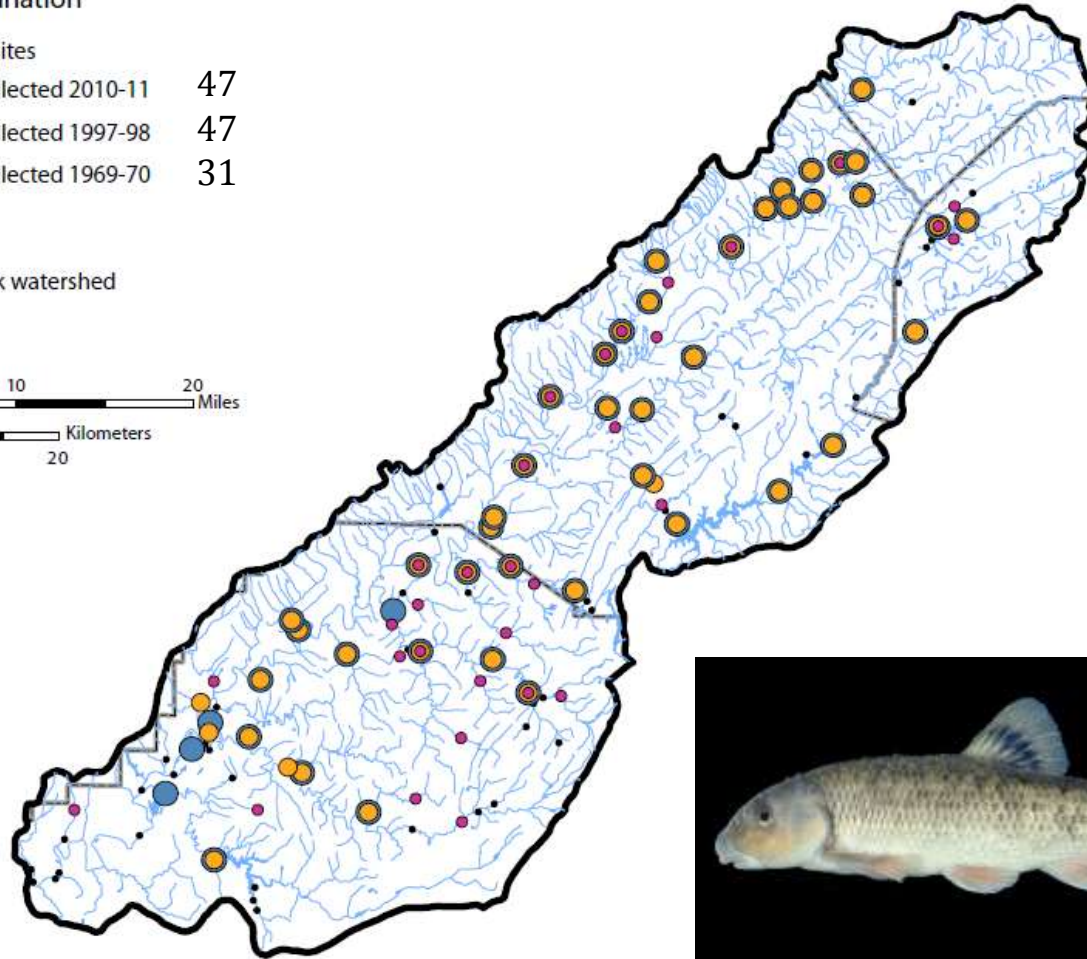
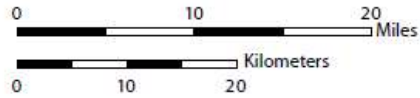


Alabama Shiner, *Cyprinella callistia*,



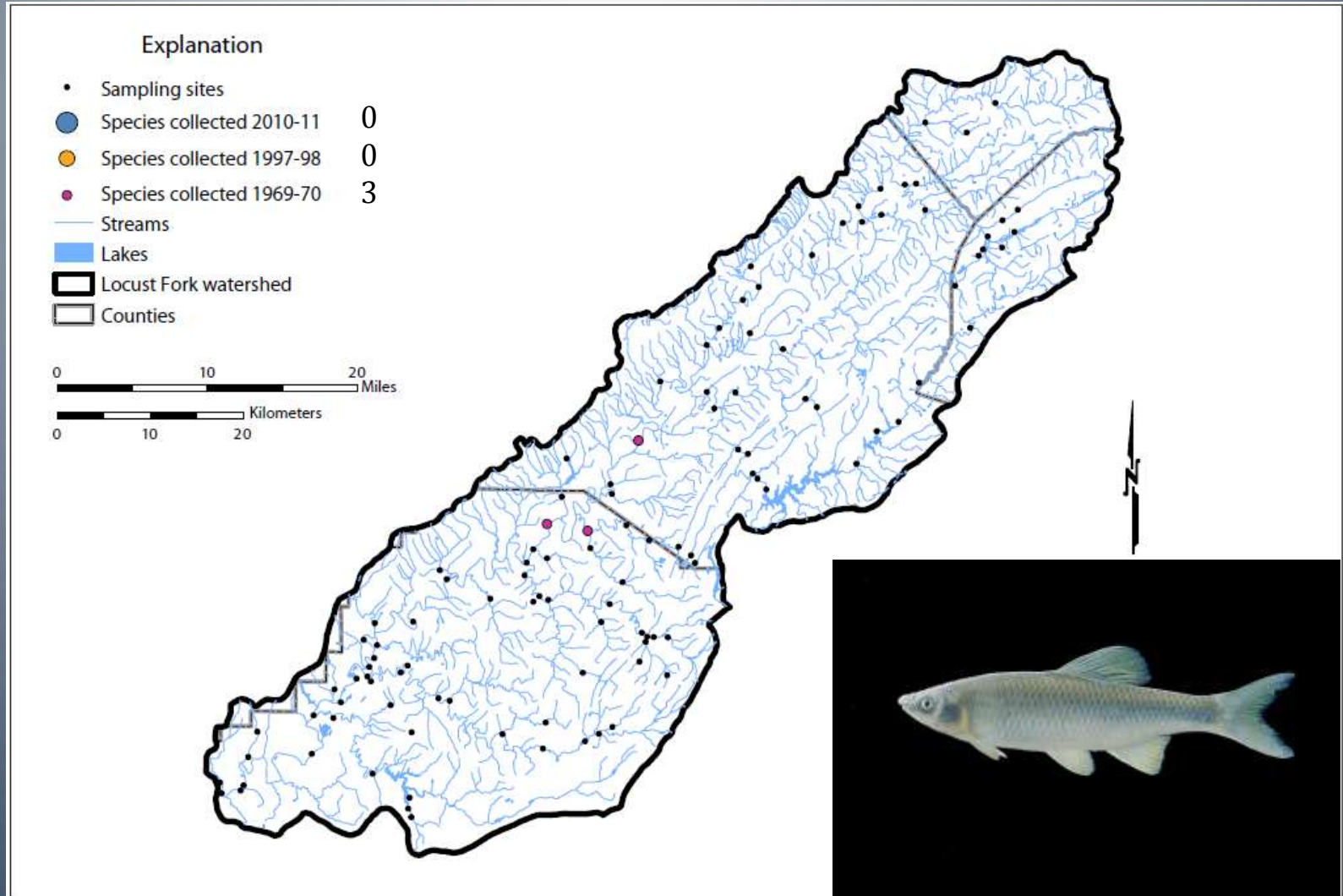
Explanation

- Sampling sites
- Species collected 2010-11 47
- Species collected 1997-98 47
- Species collected 1969-70 31
- Streams
- Lakes
- ▭ Locust Fork watershed
- ▭ Counties

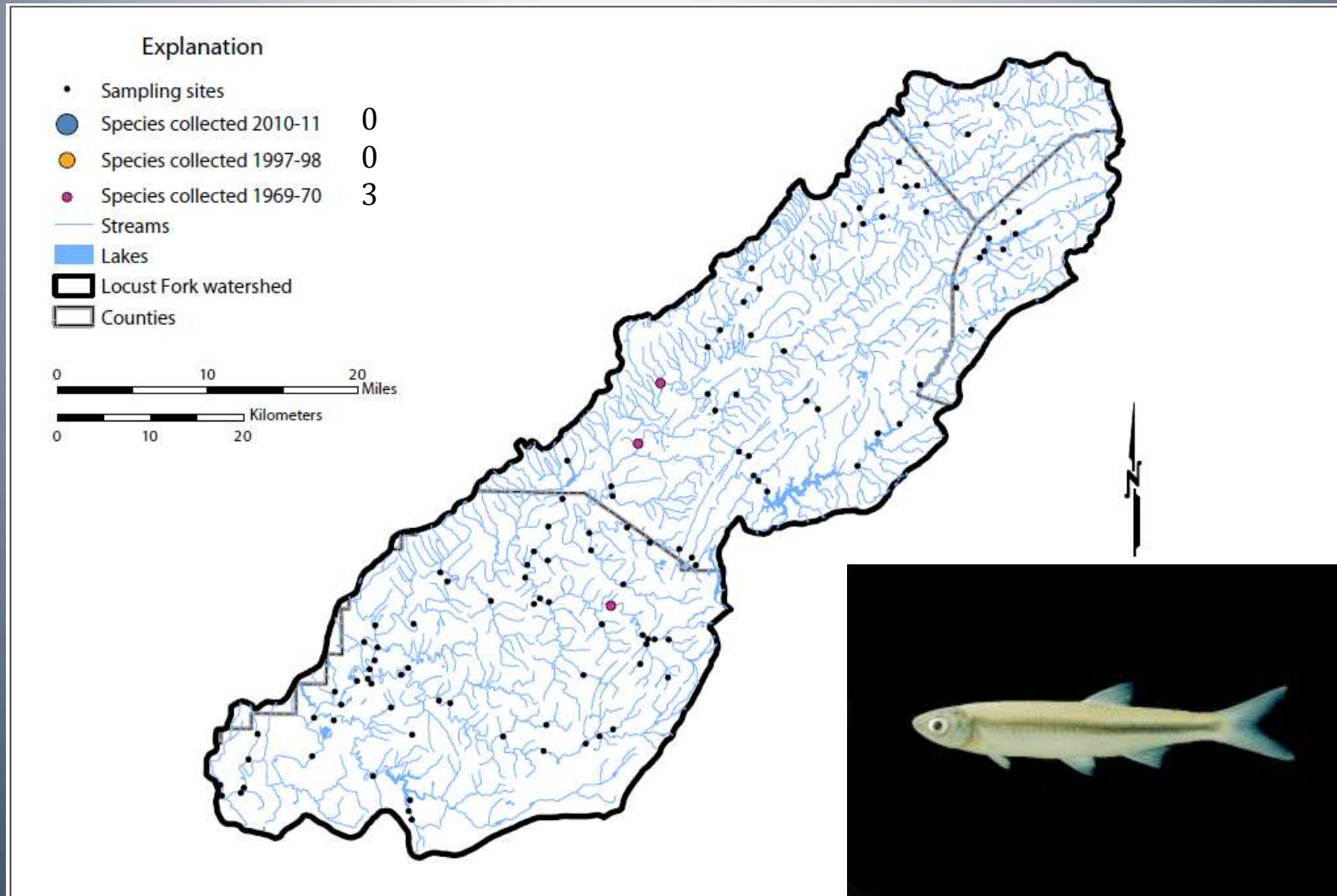


Largescale Stoneroller, *Campostoma oligolepis*



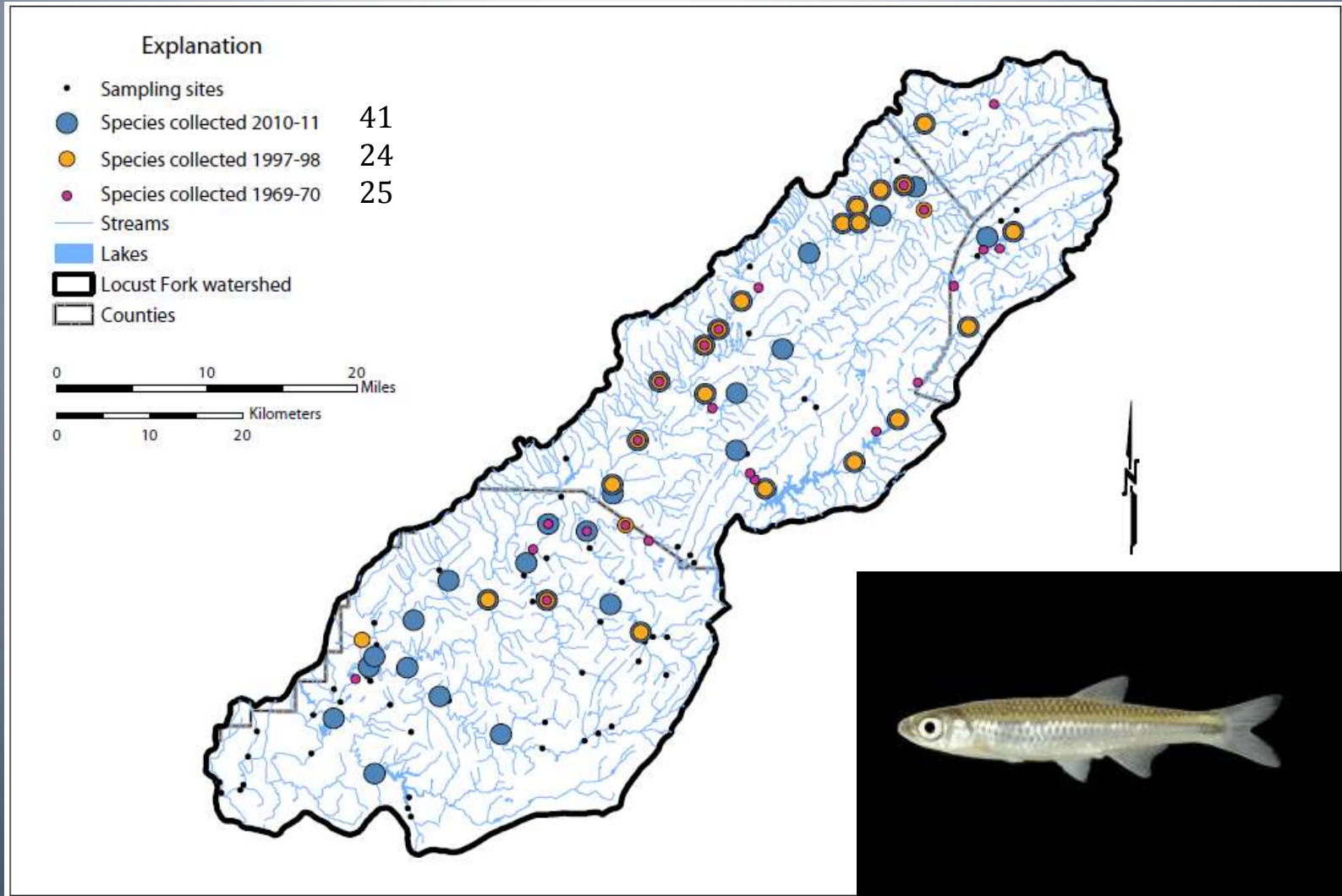


Steelcolor Shiner, *Cyprinella whipplei*



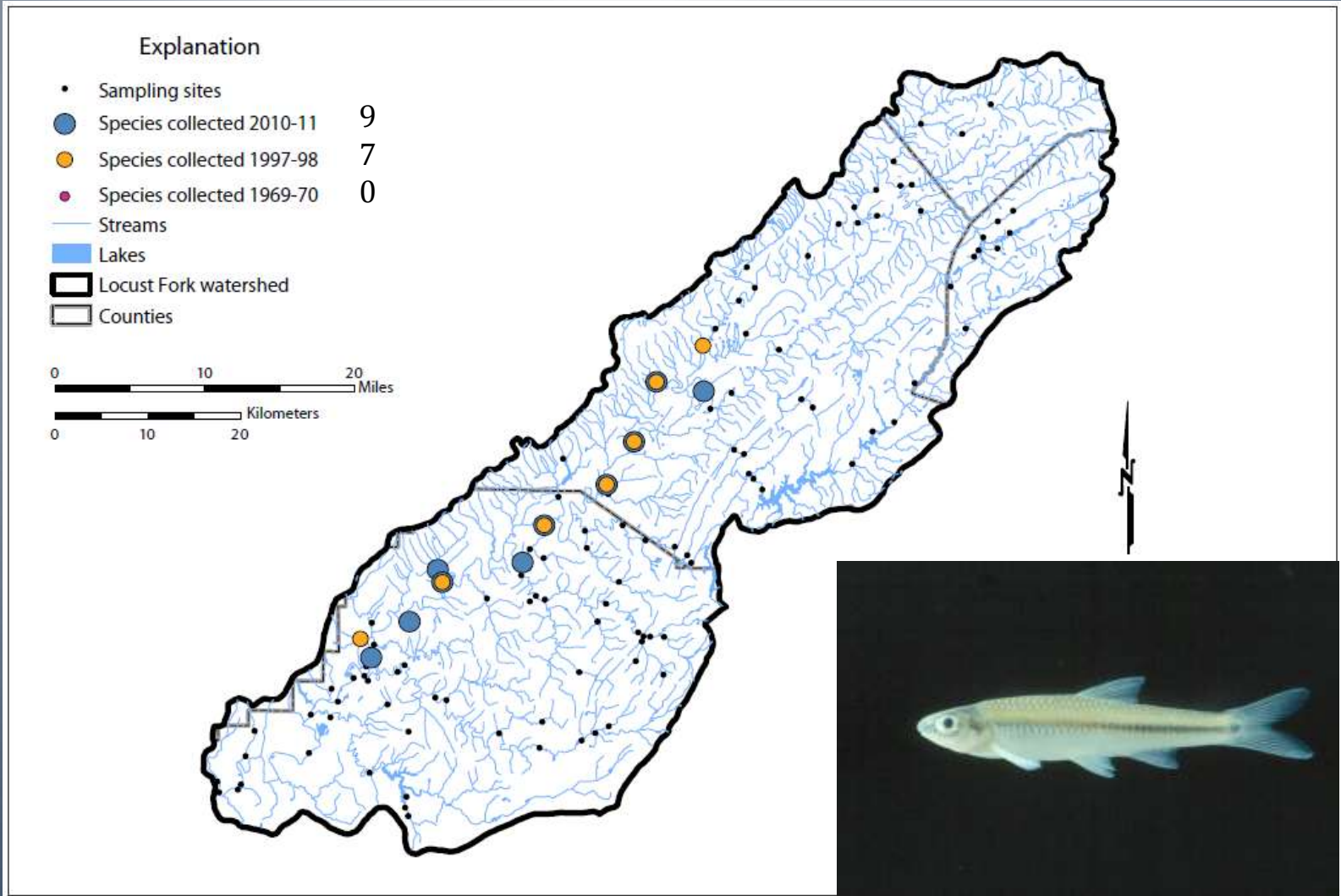
Emerald Shiner, *Notropis atherinoides*





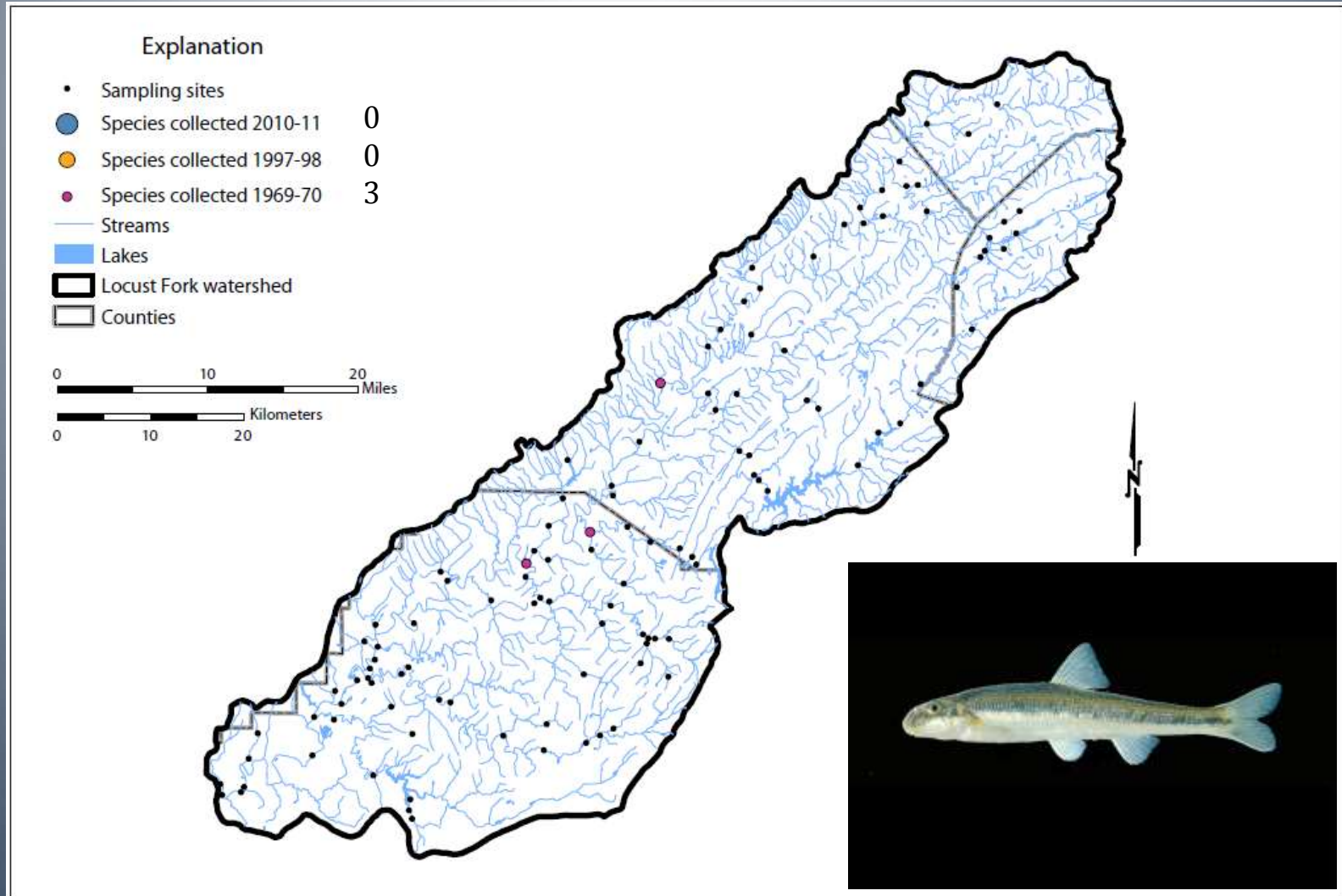
Silverstripe Shiner, *Notropis stilbius*





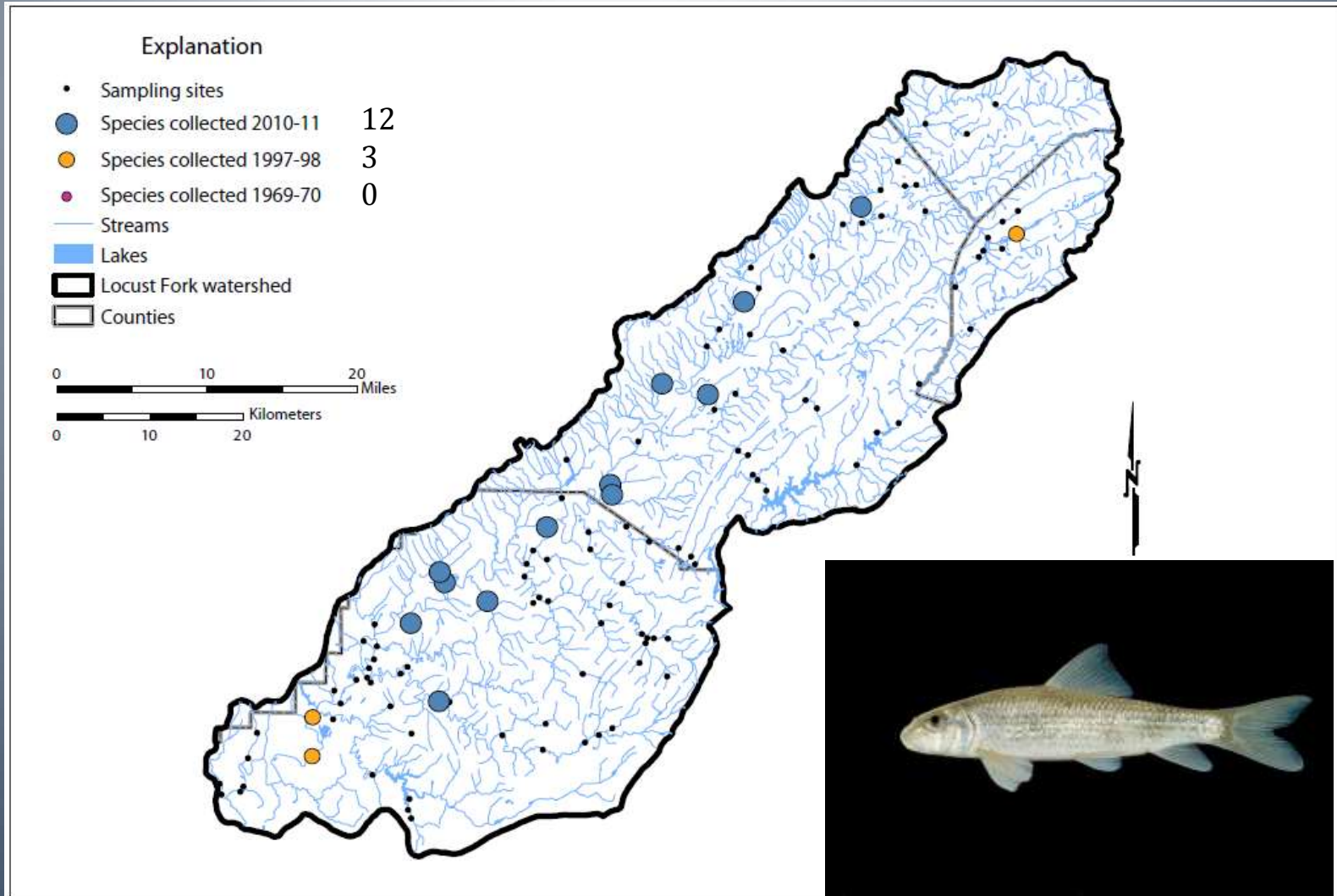
Cahaba Shiner, *Notropis cahabae*

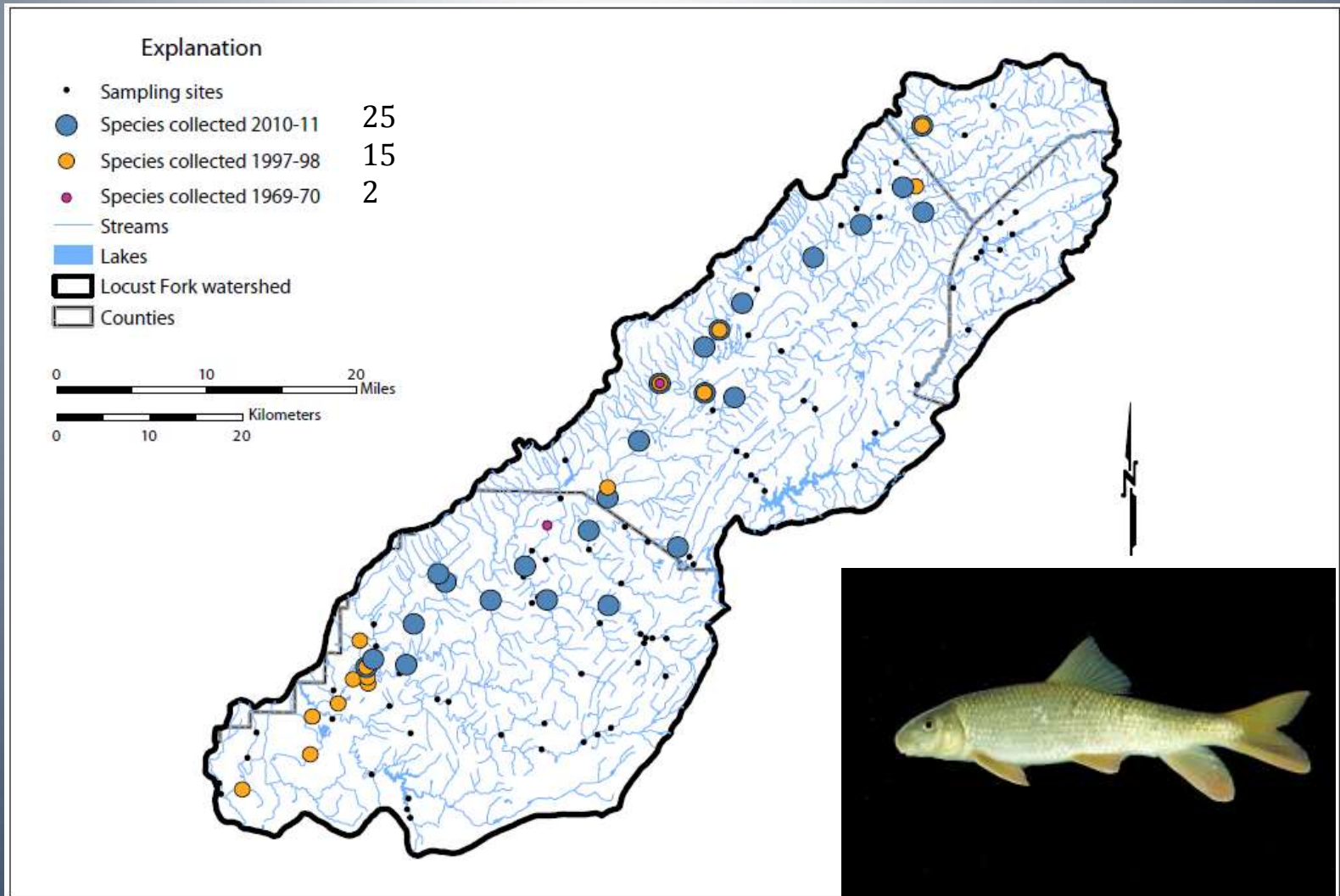




Riffle Minnow, *Phenacobius catostomus*

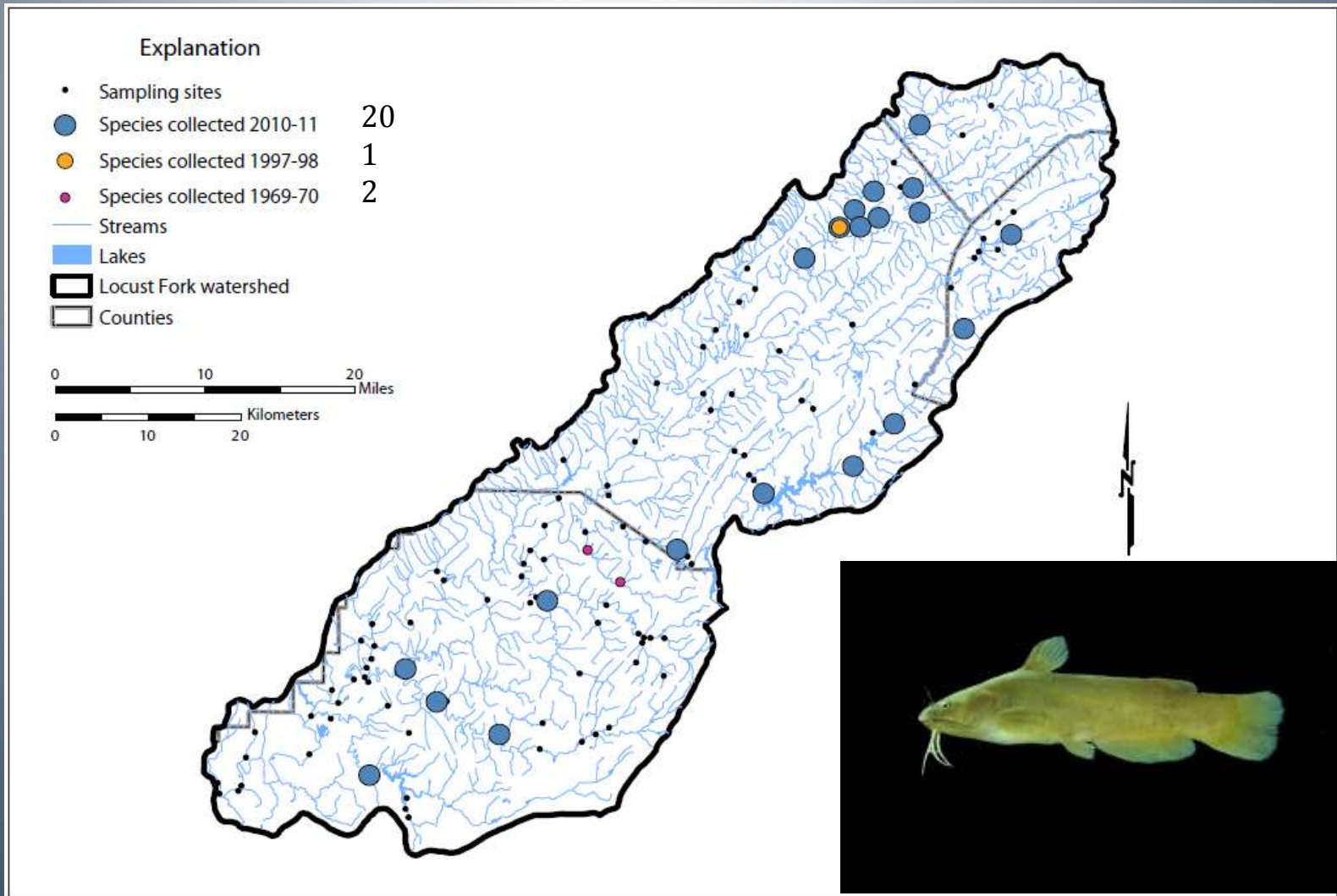






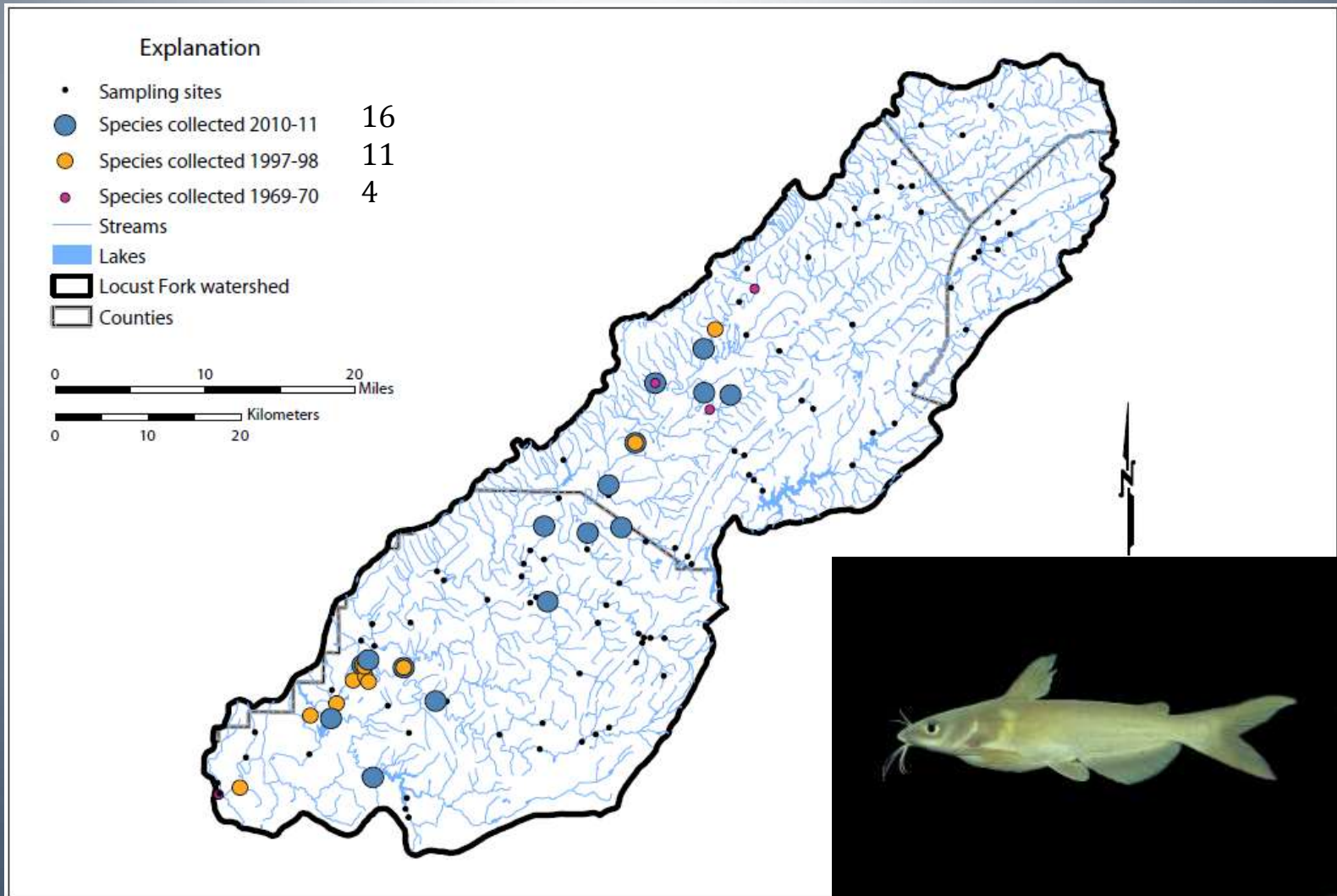
Blacktail Redhorse, *Moxostoma poecilurum*



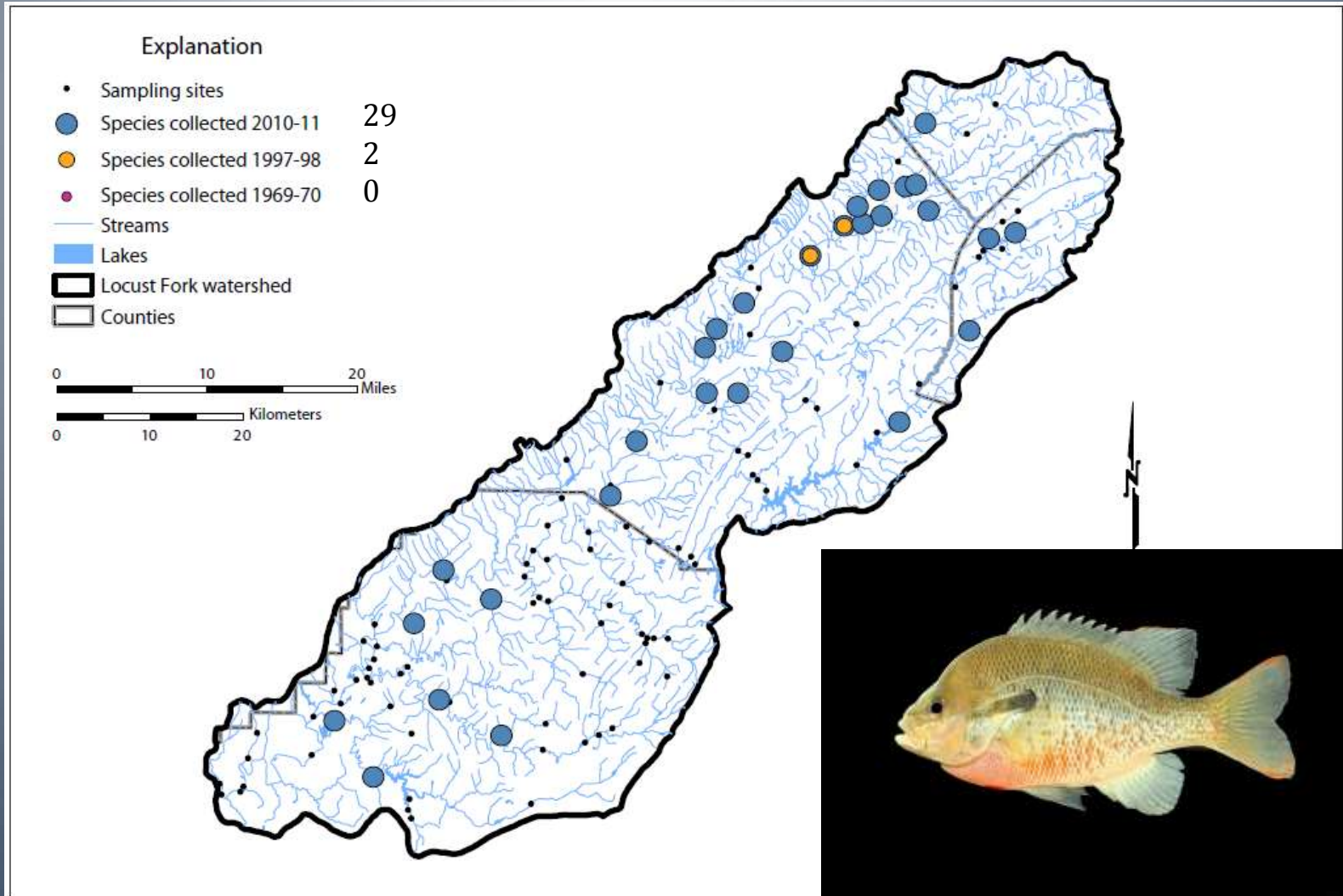


Yellow Bullhead, *Ameiurus natalis*



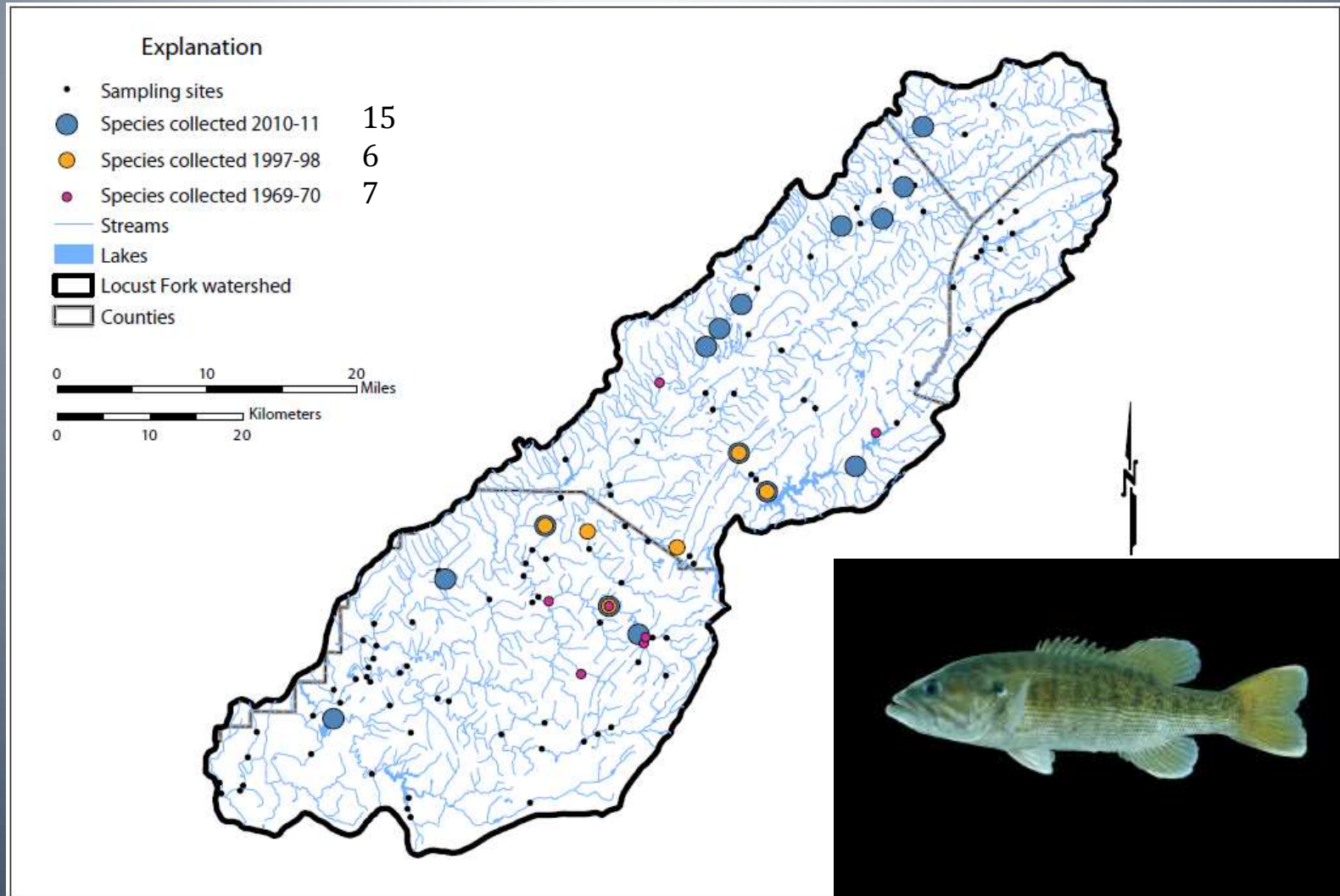


Channel Catfish, *Ictalurus punctatus*



Redbreast Sunfish, *Lepomis auritus*

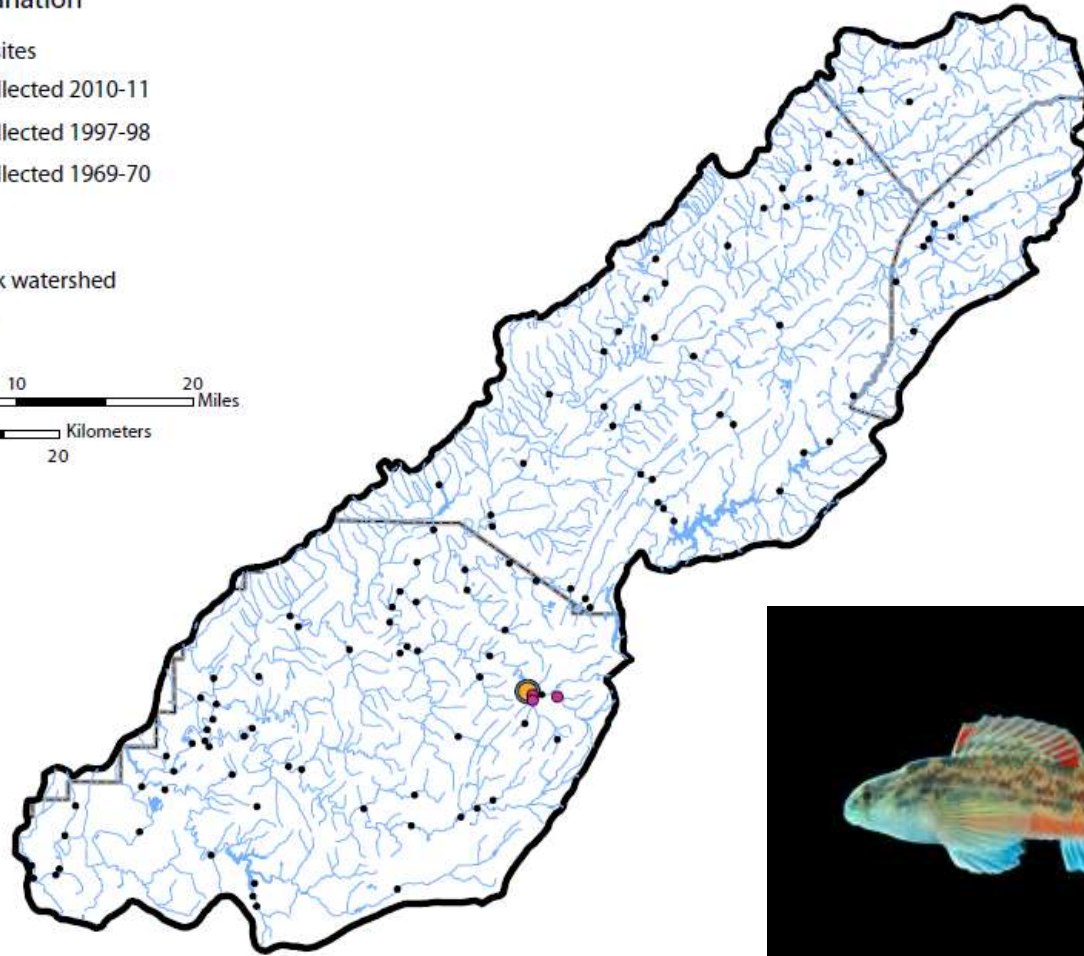
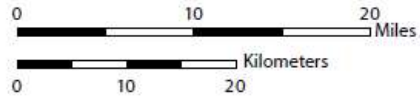




Warrior Bass, *Micropterus warriorensis*

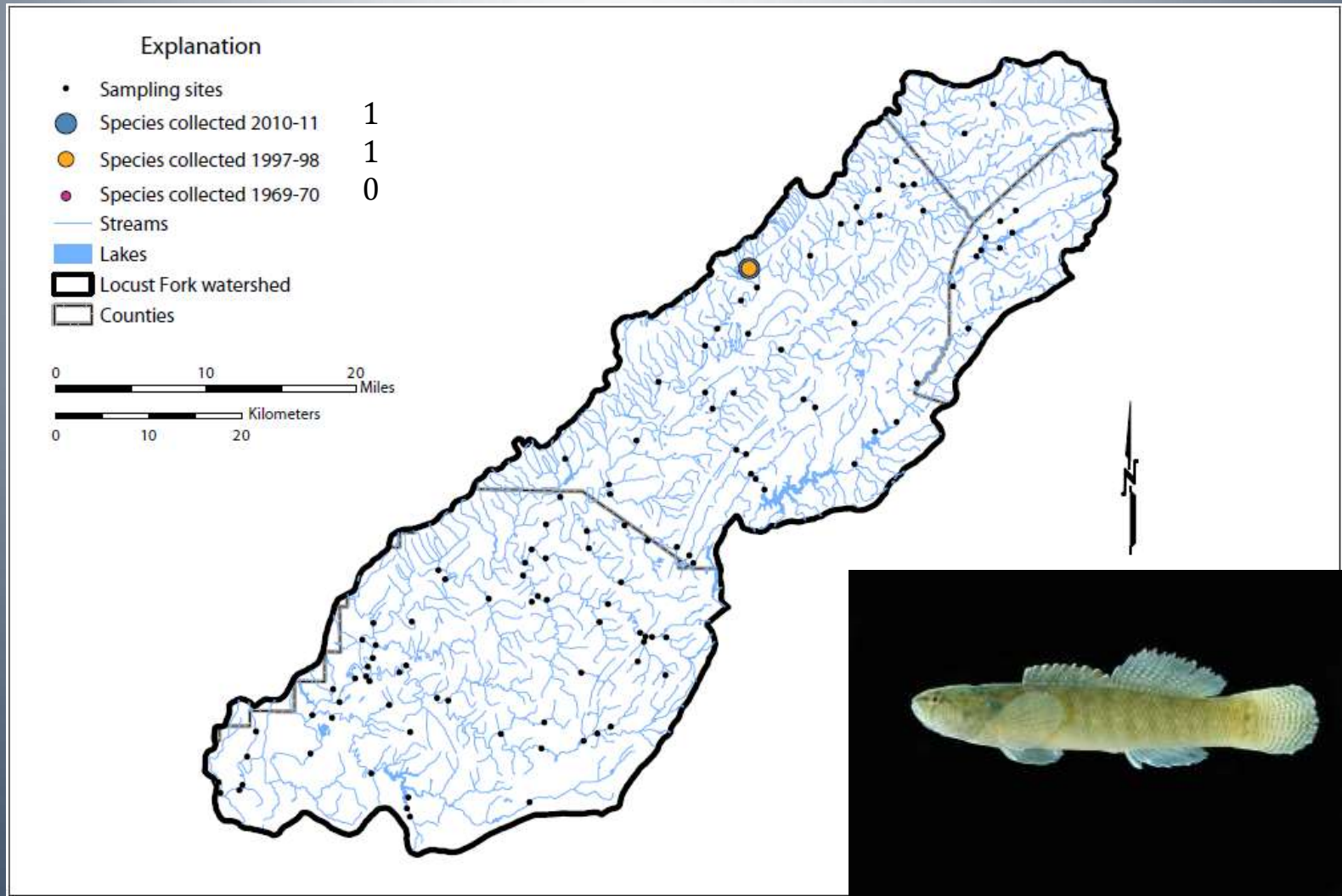
Explanation

- Sampling sites
- Species collected 2010-11
- Species collected 1997-98
- Species collected 1969-70
- Streams
- Lakes
- ▭ Locust Fork watershed
- ▭ Counties



Vermillion Darter, *Etheostoma chermocki*



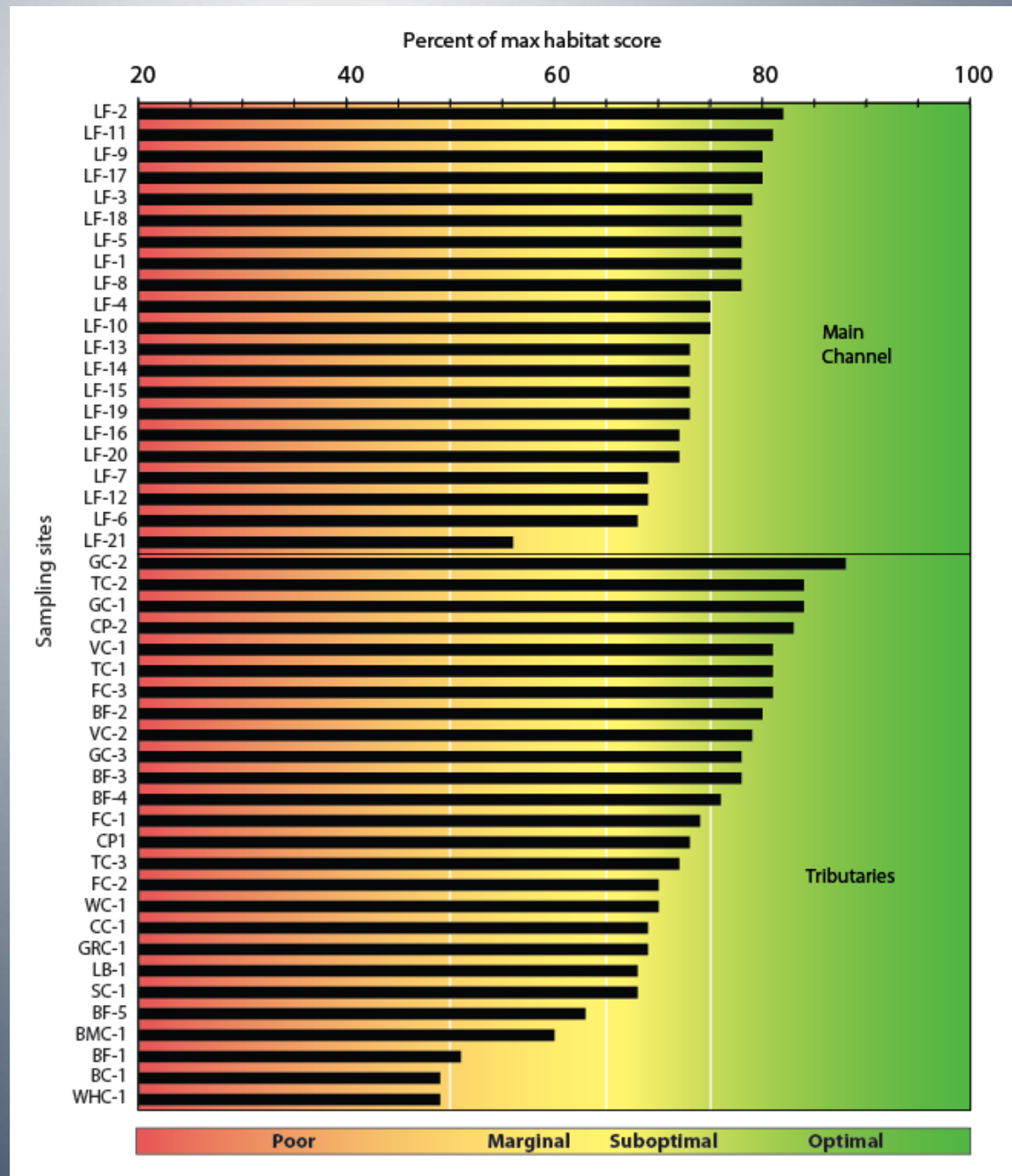


Blackfin Darter, *Etheostoma nigripinne*



Visual Habitat Assessment

2010-11



Visual Habitat Assessment

Comparison
1997-98 to 2010-11

Station number	1997-98		2010-11		Change ²
	max habitat	Habitat condition ¹	max habitat	Habitat condition ¹	
LF-1	68	S	78	O	+
LF-2	69	S	82	O	+
LF-3	71	S	79	O	+
LF-4	60	M	75	S	+
LF-5	--	--	78	O	--
LF-6	57	M	68	S	+
LF-7	59	M	69	S	+
LF-8	63	M	78	O	++
LF-9	71	S	80	O	+
LF-10	69	S	75	S	nc
LF-11	76	O	81	O	nc
LF-12	71	S	69	S	nc
LF-13	58	M	73	S	+
LF-14	60	M	73	S	+
LF-15	61	M	73	S	+
LF-16	61	M	72	S	+
LF-17	60	M	80	O	++
LF-18	54	M	78	O	++
LF-19	76	O	73	S	-
LF-20	67	S	72	S	nc
LF-21	57	M	56	M	nc
VC-1	56	M	81	O	++
VC-2	81	O	79	O	nc
FC-1	68	S	74	S	nc
FC-2	59	M	70	S	+
FC-3	63	M	81	O	++
WC-1	68	S	70	S	nc
CC-1	72	S	69	S	nc
TC-1	66	S	81	O	+
TC-2	70	S	84	O	+
TC-3	66	S	72	S	nc
GC-1	78	O	84	O	nc
GC-2	76	O	88	O	nc
GC-3	64	M	78	O	++
LB-1	67	S	68	S	nc
BF-1	40	P	51	M	+
BF-2	82	O	80	O	nc
BF-3	68	S	78	O	+
BF-4	68	S	76	O	+
BF-5	40	P	63	M	+
CP-1	59	M	73	S	+
CP-2	65	M	83	O	++
GRC-1	47	P	69	S	++
WHC-1	56	M	49	P	-
SC-1	71	S	68	S	nc
BMC-1	74	S	60	M	-
BC-1	65	M	49	P	-

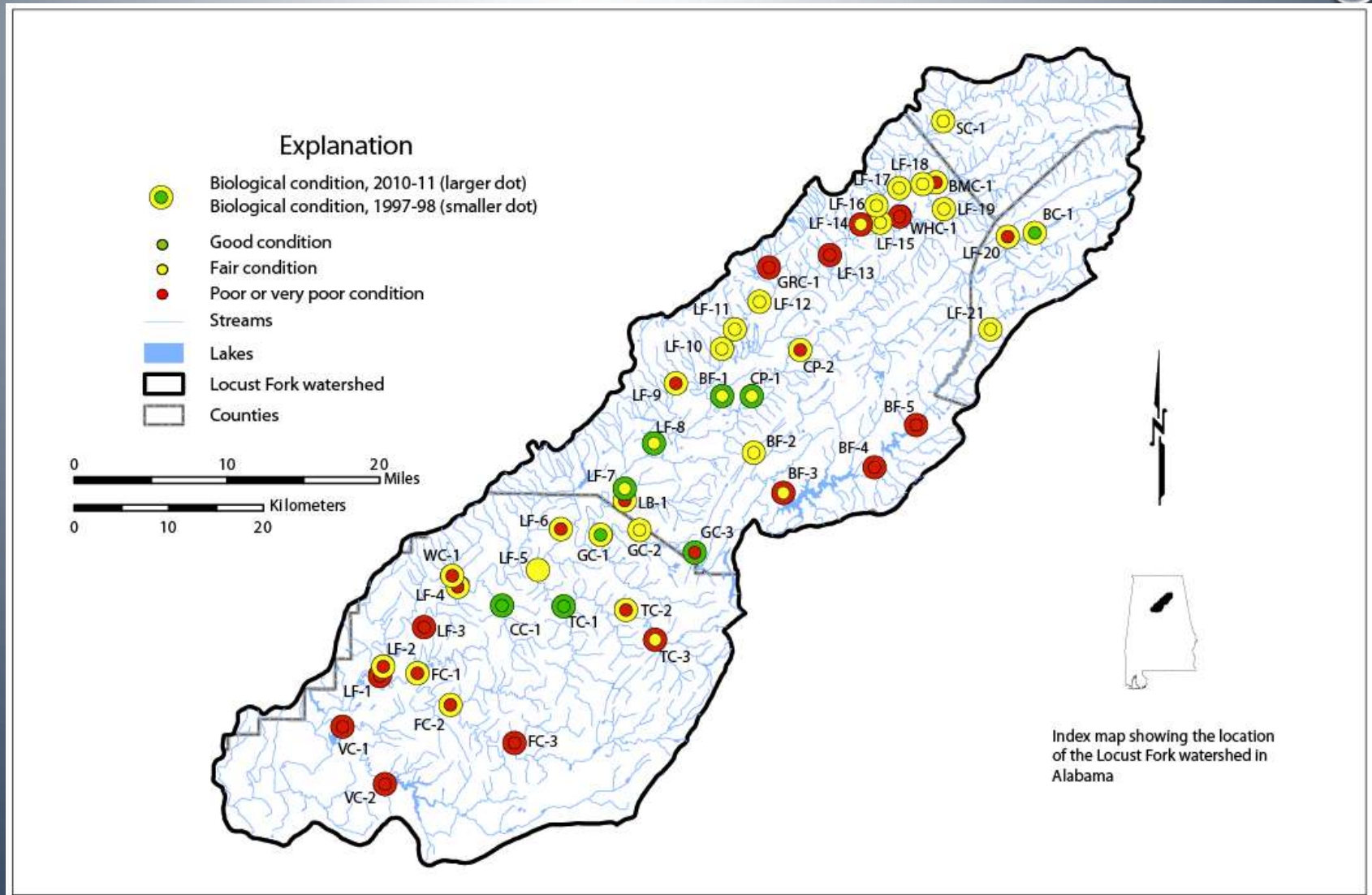
Improving - 27 (58%)

No Change - 15 (33%)

Declining - 4 (9%)



Biological Condition - IBI



Biological Condition

Comparison 1997-98 to 2010-11

Station number	1997-98		2010-11		Change ²
	IBI Score	Biological Condition ¹	IBI Score	Biological Condition	
LF-1	32	P	30	P	nc
LF-2	32	P	34	F	+
LF-3	32	P	32	P	nc
LF-4	28	P	34	F	+
LF-5	--	--	40	F	--
LF-6	32	P	40	F	+
LF-7	38	F	42	G	+
LF-8	34	F	44	G	+
LF-9	32	P	40	F	+
LF-10	38	F	40	F	nc
LF-11	38	F	38	F	nc
LF-12	38	F	40	F	nc
LF-13	32	P	32	P	nc
LF-14	34	F	30	P	-
LF-15	36	F	36	F	nc
LF-16	36	F	36	F	nc
LF-17	38	F	34	F	nc
LF-18	36	F	36	F	nc
LF-19	34	F	38	F	nc
LF-20	32	P	34	F	+
LF-21	38	F	40	F	nc
VC-1	32	P	32	P	nc
VC-2	24	VP	28	P	+
FC-1	28	P	38	F	+
FC-2	24	VP	34	F	++
FC-3	22	VP	32	P	+
WC-1	22	VP	36	F	++
CC-1	42	G	42	G	nc
TC-1	42	G	44	G	nc
TC-2	32	P	36	F	+
TC-3	36	F	32	P	-
GC-1	42	G	38	F	-
GC-2	38	F	36	F	nc
GC-3	30	P	42	G	++
LB-1	28	P	40	F	+
BF-1	40	F	46	G	+
BF-2	34	F	38	F	nc
BF-3	40	F	30	P	-
BF-4	28	P	30	P	nc
BF-5	28	P	32	P	nc
CP-1	40	F	44	G	+
CP-2	30	P	36	F	+
GRC-1	24	VP	22	VP	nc
WHC-1	30	P	32	P	nc
SC-1	38	F	36	F	nc
BMC-1	32	P	34	F	+
BC-1	46	G	34	F	-

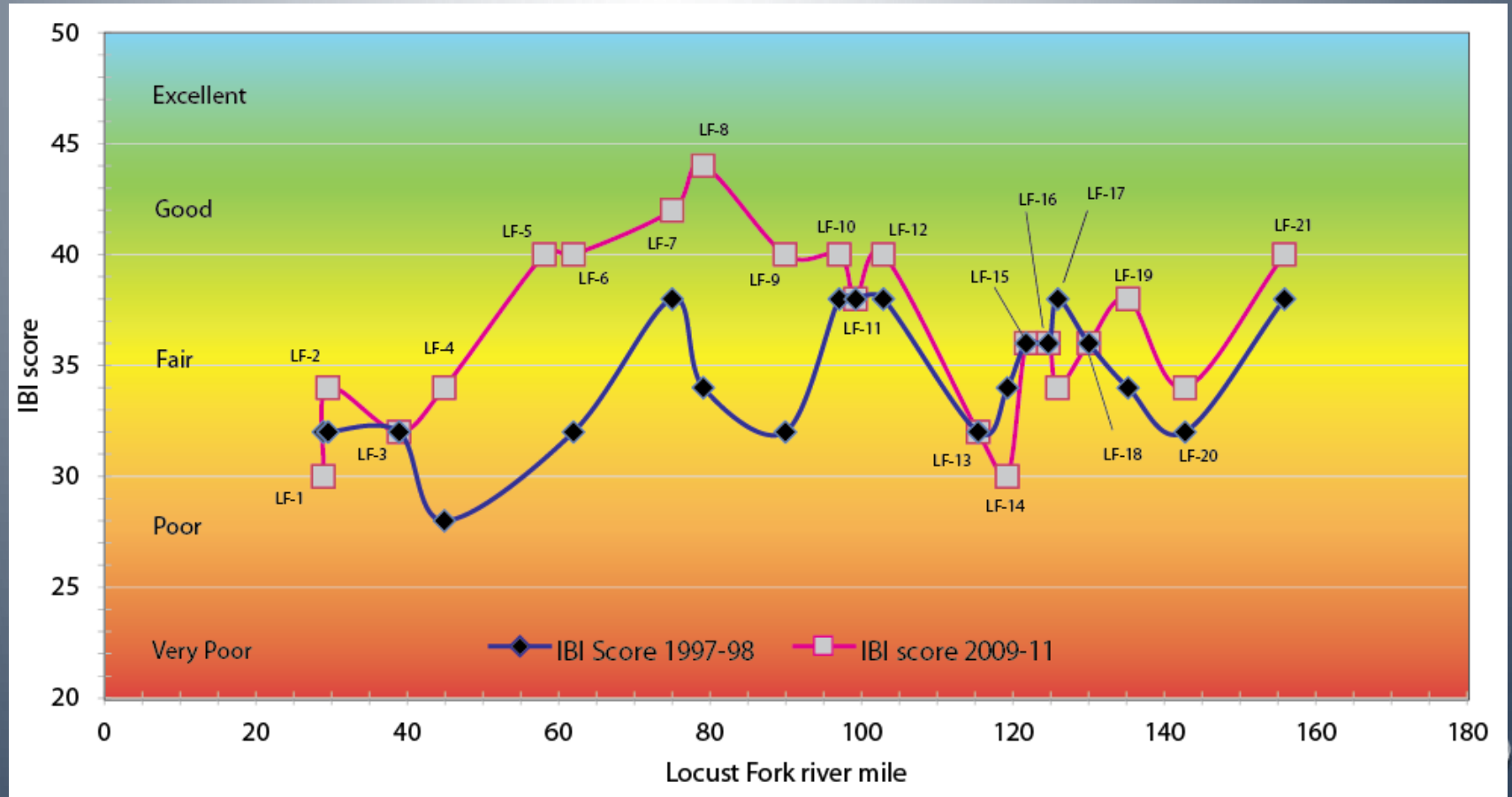
Improving - 19 (41%)

No Change - 22 (48%)

Declining - 5 (11%)



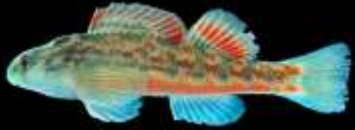
Biological Condition – Main Channel IBI



What Have We Learned?

- *Six fish species are possible extirpations (Tricolor Shiner, Steelcolor Shiner, Emerald Shiner, Riffle Minnow, Blacknose Dace, Speckled Madtom).*
- *Eight fish species newly reported from Locust Fork by Shepard and O'Neil studies (Chestnut Lamprey, Clear Chub, Cahaba Shiner, Atlantic Needlefish, Blackfin Darter, Highfin Carpsucker, White Catfish, Yellow Perch).*
- *Some invasive species have expanded their range in Locust Fork (Redbreast Sunfish).*
- *Habitat appears to have improved overall since 1997-98, but remains poor in select subwatersheds.*
- *Biological condition appears to have improved overall since 1997-98, but areas of poor condition still occur.*





Questions ?

