Appendix I1: Young-of-the-Year (YOY) Bluegill Assessment

Attachment I1-1: Completed Young-of-the-Year (YOY) Bluegill Field Sampling Forms

Attachment I1-2: Completed Young-of-the-Year (YOY) Bluegill Assessment Samples: Group Health Examination Forms

Attachment I1-3: Completed Young-of-the-Year (YOY) Bluegill Assessment Samples: Individual Assessment Forms

Attachment I1-4: Completed Third-Party (J. Hawke, LSU) Young-of-the-Year (YOY) Bluegill Assessment Forms

Attachment I1-5: Young-of-the-Year (YOY) Bluegill Analytical Samples: Digital Image Log

Appendix I2: Alternative Selenium and Arsenic Screening Criteria Considerations

Appendix I1: Young-of-the-Year (YOY) Bluegill Assessment

Attachment I1-1: Completed Young-of-the-Year (YOY) Bluegill Field Sampling Forms

		Lake Young-C COLLECTION E			RA	MBCLL
Sampling Date(s): Weather Forecast: Air Temp: 204 Wat	6			mplin	б	
YOY Bass Sampling Region (circle one):         Curds Inlet       HQ Inlet       LHL1(Rocky Arm)       LHL2(Dix Dam)       LHL3 Cove       LHL 6						
Sample ID: e.g. (YOYBASS-001-LHL6), or (YOYBASS - 001TS - LHL6)	Sampling Location Description e.g. 50' north of CI2, west shore)	Sampling Method (Seine, Electrofish, Minnow Trap etc.)	Start Time (24hr clock)	Sampling Duration (in hrs)	Sample Size (N=)	No. in Photo <sup>a,b</sup> (N=)
	Curds Ind Near Of 1	Minnau Klops	930am	1	15	
	yppur outfall	Sein Drop	) 1:045A	n 2	~:500+	
						17.
Notes: a) For unaffected YOY	Bass, a maximum of 100 indi	viduals will fit wit	hin 20" X 10"	image field, pr	oviding detaile	d imagery of

both the left and right sides of the fish (two photos). b) For the YOY analytical subsample of approximately 10 YOY bass (minimum 5 grams total weight), detailed imagery will be captured of both the left and right sides of each individual (two photos) before they are frozen for shipment to the laboratory.

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	-	Lake Young-C COLLECTION E			RA	MBCLL
Primary Fish Collect Sampling Date(s): Weather Forecast: Air Temp: <u>30</u> f Wat	July 20, 2018 UNK er Temp: 80f			I sam	rlo sepe	sat
Curds Inlet		ss Sampling Reg ocky Arm) Lł	ion (circle o IL2(Dix Dam)	-	ove LHL	6 Cove
Sample ID: e.g. (YOYBASS-001-LHL6), or (YOYBASS - 001TS - LHL6)	Sampling Location Description e.g. 50' north of CI2, west shore)	Sampling Method (Seine, Electrofish, Minnow Trap etc.)	Start Time (24hr clock)	Sampling Duration (in hrs)	Sample Size (N=)	No. in Photo <sup>a,b</sup> (N=)
	Middle CI O CONO OF OWAFall + just downstrees east shore		1030	0.25	598	
	N.	(2 haulo)	1.	0.25	1282	
Notes:			I			

b) For the YOY analytical subsample of approximately 10 YOY bass (minimum 5 grams total weight), detailed imagery will be captured of both the left and right sides of each individual (two photos) before they are frozen for shipment to the laboratory.

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		Lake Young-C COLLECTION E			RA	MBULL
Primary Fish Collect	or(s): AJS, FW	Notes:				
	Jul 21 St, 2018		- 0.014	Att wel.	eased vi	270
Weather Forecast:	UNK	TT PIS		Juli	eased vi	reside
Air Temp: 854 Wat	- Concel					Minhows
Curds Inlet	<b>\</b>	ss Sampling Reg ocky Arm) Lł	ion (circle o 1L2(Dix Dam)	-	ove LHL	6 Cove
Sample ID: e.g. (YOYBASS-001-LHL6), or (YOYBASS - 001TS - LHL6)	Sampling Location Description e.g. 50' north of CI2, west shore)	Sampling Method (Seine, Electrofish, Minnow Trap etc.)	Start Time (24hr clock)	Sampling Duration (in hrs)	Sample Size (N=)	No. in Photo <sup>a,b</sup> (N=)
	Middle CI & dry outfa Near CI 2	el Seine Net	1500	.73	181	
	Middle CI & dry outfa Near CI2 Midde OF O Wetout fall Near CI 2.I	(2 pulls)	1545	. 25	49*	
		U				
÷						
Netosi						
<u>Notes:</u> a) For unaffected YOY	Bass, a maximum of 100 indi	viduals will fit wit	hin 20" X 10"	image field, pr	oviding detaile	d imagery of

both the left and right sides of the fish (two photos). b) For the YOY analytical subsample of approximately 10 YOY bass (minimum 5 grams total weight), detailed imagery will be captured of both the left and right sides of each individual (two photos) before they are frozen for shipment to the laboratory.

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		Lake Young-C COLLECTION E			RA	MBCLL
Primary Fish Collec	tor(s): ASJ DJ	Notes:				
Sampling Date(s):	July 20,2018	1				
Weather Forecast:	Sunny, possibly rain	1				
Air Temp: 72° Wa	ter Temp: cstimate souse	1				
		ss Sampling Reg	ion (circle o	ne):		
Curds Inlet	HQ Inlet LHL1(Ro	ocky Arm) Li	IL2(Dix Dam)	LHL3 C	ove LHL	6 Cove
Sample ID: e.g. (YOYBASS-001-LHL6), or (YOYBASS - 001TS - LHL6)	Sampling Location Description e.g. 50' north of CI2, west shore)	Sampling Method (Seine, Electrofish, Minnow Trap etc.)	Start Time (24hr clock)	Sampling Duration (in hrs)	Sample Size (N=)	No. in Photo <sup>a,b</sup> (N=)
	Lover Curds CT-4 west shore	Seine	10:45	2 hrs 15 min	31	
Notes:						

b) For the YOY analytical subsample of approximately 10 YOY bass (minimum 5 grams total weight), detailed imagery will be captured of both the left and right sides of each individual (two photos) before they are frozen for shipment to the laboratory.

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	FISH	Lake Young-C COLLECTION E	FFORT FO	RM	2.4	MEGIL
Primary Fish Collect Sampling Date(s):		Notes: directions	lleft	id Da	o Loni of	L. L.K
	Powest, Alan	-			GEYMMEA	ey lan
Weather Forecast:	- TO sinny	into the	careliv	let		
	er Temp: estimate 80-85					
YOY Bass Sampling Region (circle one):           Curds Inlet         HQ Inlet         LHL1(Rocky Arm)         LHL2(Dix Dam)         LHL3 Cove						
Sample ID: e.g. (YOYBASS-001-LHL6), or (YOYBASS - 001TS - LHL6)	Sampling Location Description e.g. 50' north of CI2, west shore)	Sampling Method (Seine, Electrofish, Minnow Trap etc.)	Start Time (24hr clock)	Sampling Duration (in hrs)	Sample Size (N=)	No. in Pho (N=)
	3.2 transact right bank tleft pank mouth of inlet	Trap	10210	30 Mins	10	
	Mouth of inlet Aight side 30067 for point	trap	13:35	Smins	vD	
5						
		-				

b) For the YOY analytical subsample of approximately 10 YOY bass (minimum 5 grams total weight), detailed imagery will be captured of both the left and right sides of each individual (two photos) before they are frozen for shipment to the laboratory.

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		n Lake Young-C COLLECTION E			RA	MBŐLL
Primary Fish Collect Sampling Date(s): Weather Forecast: Air Temp: ~70° Wat	tor(s): Forest Alan	Notes: divection looking int			determined	l by
Curds Inlet	-	ss Sampling Reg ocky Arm) Lł	ion (circle o IL2(Dix Dam)		ove LHL	6 Cove
Sample ID: e.g. (YOYBASS-001-LHL6), or (YOYBASS - 001TS - LHL6)	Sampling Location Description e.g. 50' north of CI2, west shore)	Sampling Method (Seine, Electrofish, Minnow Trap etc.)	Start Time (24hr clock)	Sampling Duration (in hrs)	Sample Size (N=)	No. in Photo <sup>a,</sup> (N=)
	all of laner Crudic intet	traps	14:15	the 30mins	48	
n						
	E					
Notes:	Bass, a maximum of 100 ind	ividuals will fit wit	hin 20" X 10"	image field or	roviding details	d imagery of

b) For the YOY analytical subsample of approximately 10 YOY bass (minimum 5 grams total weight), detailed imagery will be captured of both the left and right sides of each individual (two photos) before they are frozen for shipment to the laboratory.

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	FISH	Lake Young-C COLLECTION E			RA	MBCLL
Primary Fish Collec Sampling Date(s):	51/14 22,2018	Notes:				
Weather Forecast:	75 cloudy	1				
Air Temp: 70 Wat						
Curds Inlet		ss Sampling Reg ocky Arm) Lł	ion (circle o 1L2(Dix Dam)		ove LHL	6 Cove
Sample ID: e.g. (YOYBASS-001-LHL6), or (YOYBASS - 001TS - LHL6)	Sampling Location Description e.g. 50' north of CI2, west shore)	Sampling Method (Seine, Electrofish, Minnow Trap etc.)	Start Time (24hr clock)	Sampling Duration (in hrs)	Sample Size (N=)	No. in Photo <sup>a,b</sup> (N=)
	Lover CI West Bank	Minnow traps (5)	940avn	0.5	27	
Notes:						

b) For the YOY analytical subsample of approximately 10 YOY bass (minimum 5 grams total weight), detailed imagery will be captured of both the left and right sides of each individual (two photos) before they are frozen for shipment to the laboratory.

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Primary Fish Collect	or(s): AJSEU	Notes:				
Sampling Date(s):	5,113	-				
	Dai JOF		÷.			
Weather Forecast: Air Temp: 70 Wate	er Temp: N& OF	1				
		ss Sampling Regi	on (circle or	ne):		
Curds Inlet	HQ Inlet LHL1(Ro	ocky Arm) LH	LHL2(Dix Dam) LHL3 Cove LHL 6 Cove			
Sample ID: e.g. (YOYBASS-001-LHL6), or (YOYBASS - 001TS - LHL6)	Sampling Location Description e.g. 50' north of C12, west shore)	Sampling Method (Seine, Electrofish, Minnow Trap etc.)	Start Time (24hr clock)	Sampling Duration (in hrs)	Sample Size (N=)	No. in Photo <sup>a,</sup> (N=)
star i	Lower CI Vegtshore	Minu Trapo	945 AM	15	4	
	eastshore	v	1015	ylhr	52	
	×					
- · · ·						

a) For unaffected YOY Bass, a maximum of 100 individuals will fit within 20" X 10" image field, providing detailed imagery of

both the left and right sides of the fish (two photos). b) For the YOY analytical subsample of approximately 10 YOY bass (minimum 5 grams total weight), detailed imagery will be captured of both the left and right sides of each individual (two photos) before they are frozen for shipment to the laboratory.

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mary Fish Collect mpling Date(s): eather Forecast:	Jul 25, 2018 Sunny 807	Notes:			5	
ir Temp: 20+Wate LowEft Curds Inlet	YOY Bas	ss Sampling Regi ocky Arm) LH	on (circle or IL2(Dix Dam)	ne): LHL3 C	ove LHL	6 Cove
Sample ID: e.g. (YOYBASS-001-LHL6), or (YOYBASS - 001TS - LHL6)	Sampling Location Description e.g. 50' north of C12, west shore)	Sampling Method (Seine, Electrofish, Minnow Trap etc.)	Start Time (24hr clock)	Sampling Duration (in hrs)	Sample Size (N=)	No. in Photo <sup>a,b</sup> (N=)
	Rock Bowl	Minnau Trops (14)	1100	1. Shrs	56	
	îı	Dip Net	1200	XL-V ,5	53	
	* 1 <b>\</b>	mimow T(9ps (14)	1230	, 3hr	25	
	Ju	L)	1330	.3hr	7	
	÷	Dip Net	1345		8	
	Ì1	minnow Traps(14)	1440	.25	. 11	
		P.p Net	1440	15	))	

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	tor(s): AJS DJ	Notes:				
ampling Date(s): /eather Forecast:	Thur Jul 26th 85f sunny	_				
ir Temp: 164 Wat	er Temp: 82-84f	10				
	$\langle \rangle$	ocky Arm) LF	ion (circle or 1L2(Dix Dam)	ne): LHL3 C	ove LHL	6 Cove
Sample ID: e.g. (YOYBASS-001-LHL6), or (YOYBASS - 001TS - LHL6)	Sampling Location Description e.g. 50' north of CI2, west shore)	Sampling Method (Seine, Electrofish, Minnow Trap etc.)	Start Time (24hr clock)	Sampling Duration (in hrs)	Sample Size (N=)	No. in Photo <sup>a,b</sup> (N=)
	Rock Boull Nock Boull Near point	Trops (14)	9 AM	lhr	80	
	n	dip vel	9 30AM	0.25h	8	
	и	Minnow Traps	300pm	lhr	28	
i - i - i	il	Electro Shocking	3.45pm	0.Zhr (3435)	43	

(d)

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HQ Inlet LHL1(Ro	Notes: ss Sampling Regi cky Arm) LH	on (circle or	1e):		
HQ Inlet		on (circle or	ne):		
HQ Inlet		on (circle or	1e):		
HQ Inlet LHL1(Ro		on (circle or	1e):		
HQ Inlet LHL1(Ro		on (circle or	1e):		
	cky Arm) LH				
		L2(Dix Dam)	LHL3 Co	ove LHL	6 Cove
Sampling ocation Description e.g. 50' north of CI2, west shore)	Sampling Method (Seine, Electrofish, Minnow Trap etc.)	Start Time (24hr clock)	Sampling Duration (in hrs)	Sample Size (N=)	No. in Photo <sup>a</sup> (N=)
Ha Inled East Bank	Fluttro	100	18 <b>4</b> 35 (1hr)	144	
Ha Tulit	bandy in	1200	(16575) :75hr	77	
d D					
	.g. 50' north of CI2, west shore) HQ Inted East Bowk Half Bried 12 Inted 12 Inted 12 Inted 12 Inted 13 Inted 14 Bowk 14 Bowk 1	.g. 50' north of CI2, west shore) (Seine, Electrofish, Minnow Trap etc.) HQ INLED ELECTRO E Gott Bonk Hay of Next bank to Tweet to Tweet t	.g. 50' north of CI2, west shore)       (Seine, Electrofish, Minnow Trap etc.)       (24hr clock)         HQ Intel       Fultro Shock       [100]         HQ Intel       HQ Intel       [100]         HQ Intel       [100]       [100]         HQ Intel       [100]       [100]	g. 50' north of CI2, west shore)     (Seine, Electrofish, Minnow Trap etc.)     (24hr clock)     United (in hrs)       HQ Intel     Fault to Shock shock     1100     1843s (1hr)       HQ Intel     Fault to Shock shock     1100     1843s (1hr)       HQ Intel     Fault to Shock shock     1100     1843s (1hr)       HQ Intel     Fault to Shock shock     1100     1843s (1hr)       HQ Intel     Fault to Shock shock     11200     (1hr)       HQ Intel     West bowk 11     1200     (1hr)       Habb Habb Hack     Intel     Intel     Intel       Near Habb Hack     Intel     Intel     Intel       Intel     Intel     Intel     Intel	Image: Sol north of CI2, west shore)     (Seine, Electrofish, Minnow Trap etc.)     Image: Construction (in hrs)     (N=)       Ha Inlet     Felettros     1100     18435     144       Fact     Bank     Shock     1100     18435     144

both the left and right sides of the fish (two photos). b) For the YOY analytical subsample of approximately 10 YOY bass (minimum 5 grams total weight), detailed imagery will be captured of both the left and right sides of each individual (two photos) before they are frozen for shipment to the laboratory.

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	Notes: ss Sampling Reg pcky Arm) Lł	ion (circle o IL2(Dix Dam)	ne):		
85F 82F YOY Ba		-	ne):		
85F 82F YOY Ba		-	ne):		
		-	ne):		
		-	ne):		
/	ocky Arm) Lł	L2(Dix Dam)	- 0		
pling			LHL3 C	ove LHL	6 Cove
Description th of CI2, west ore)	Sampling Method (Seine, Electrofish, Minnow Trap etc.)	Start Time (24hr clock)	Sampling Duration (in hrs)	Sample Size (N=)	No. in Photo <sup>a,I</sup> (N=)
a viooft Ne	Electro Shoch	1350	1 5 Loch 40	61	
#1					
					A viooft Electro 1340 I food 4085

b) For the YOY analytical subsample of approximately 10 YOY bass (minimum 5 grams total weight), detailed imagery will be captured of both the left and right sides of each individual (two photos) before they are frozen for shipment to the laboratory.

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		1				
		Lake Young-O			RA	MBCLL
Primary Fish Collect	or(s): Forrest, Alan					1 1 kin
Sampling Date(s):	7-24-18	Notes: directions	lefin	ight) de	termine cl	by 10011 ing
Weather Forecast:	~800 Sunny	into the	covelint	et		
Air Temp: 🎾 🛛 Wat						
10 C	YOY Ba	ss Sampling Regi	ion (circle o	ne):		
Curds Inlet	HQ Inist LHL1(Ro	ocky Arm) LH	IL2(Dix Dam)	LHL3 Co	ove LHL	6 Cove
Sample ID: e.g. (YOYBASS-001-LHL6), or (YOYBASS - 001TS - LHL6)	Sampling Location Description e.g. 50' north of CI2, west shore)	Sampling Method (Seine, Electrofish, Minnow Trap etc.)	Start Time (24hr clock)	Sampling Duration (in hrs)	Sample Size (N=)	No. in Photo <sup>a,</sup> (N=)
28124	Woterfall at back of Invert	dip net	13:00	48 mins	6	
1						
						*
<sup>- 2</sup>						
Notes:						

b) For the YOY analytical subsample of approximately 10 YOY bass (minimum 5 grams total weight), detailed imagery will be captured of both the left and right sides of each individual (two photos) before they are frozen for shipment to the laboratory.

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		Lake Young-C COLLECTION E			RA	MBOLL	
Primary Fish Collect	or(s): Forest, Alga	Notes:				1	
Sampling Date(s):		direction looking in	slleft	(abt) d	eterminer	a bu	
Weather Forecast:	rain and avercast			1. 1.	lat		
Air Temp:	er Temp: Ost mate 80-85"				VICI		
10000	YOY Bass Sampling Region (circle one):						
Curds Inlet	HQ Inlet LHL1(Ro	ocky Arm) Lł	IL2(Dix Dam)	LHL3 C	ove LHL	6 Cove	
Sample ID: e.g. (YOYBASS-001-LHL6), or (YOYBASS - 001TS - LHL6)	Sampling Location Description e.g. 50' north of CI2, west shore)	Sampling Method (Seine, Electrofish, Minnow Trap etc.)	Start Time (24hr clock)	Sampling Duration (in hrs)	Sample Size (N=)	No. in Photo <sup>a,b</sup> (N=)	
	left side of Ha inlet, 200 ft of	Seine	(0:35	(O mins	0		
	right side of HR inlet, 300 ft of shareline caed	Seine	10:50	1hr	15		
	1/	dip net	11:50	(Omins	1		
in the state							
8 g. 1	а 2						
Notes:							

b) For the YOY analytical subsample of approximately 10 YOY bass (minimum 5 grams total weight), detailed imagery will be captured of both the left and right sides of each individual (two photos) before they are frozen for shipment to the laboratory.

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	Herrington FTSH (	Lake Young-O COLLECTION E	f-The-Year FFORT FOR	(YOY) M	RA	MBCLL
Primary Fish Collecto Sampling Date(s):	or(s): Fowest Alan	Notes: directions	10 M	1125	termined	by
Weather Forecast:	~70° swiny	looking in-	to the c	arelinlet		
Air Temp: 10° Wate	er Temp: est male 90 gs	s Sampling Regi	on (circle or	ne):		
Curds Inlet			IL2(Dix Dam)		ove LHL	6 Cove
Sample ID: e.g. (YOYBASS-001-LHL6), or (YOYBASS - 001TS - LHL6)	Sampling Location Description e.g. 50' north of CI2, west shore)	Sampling Method (Seine, Electrofish, Minnow Trap etc.)	Start Time (24hr clock)	Sampling Duration (in hrs)	Sample Size (N=)	No. in Photo <sup>a,</sup> (N=)
	Fallen Branch at waterfall at back of inlet	Trap	14'10	Smins	= 2	
	right side of intet. start at 1200 feel from notab	Seine	14:40	2hrs 20min	105	
	Covered ~200 St of bank					
and the						
Notes:	Y Bass, a maximum of 100 in		vithin 20" X 1	0" image field,	providing deta	iled imagery of

both the left and right sides of the fish (two photos). b) For the YOY analytical subsample of approximately 10 YOY bass (minimum 5 grams total weight), detailed imagery will be captured of both the left and right sides of each individual (two photos) before they are frozen for shipment to the laboratory.

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		Lake Young-C COLLECTION E			RA	MBCLL		
	tor(s): Fonest Alan	Notes:	(10)	$\lambda 0 1$	1 , 1	1 Inoking		
Sampling Date(s):	7-21-18	directions	s llett,	right) de	etermined	by looking		
Weather Forecast:	~70° swny	Into the c	are/inlet	-				
Air Temp: ~ /// Wat	er Temp: estimate 80-850							
Curds Inlet	YOY Bass Sampling Region (circle one):           Curds Inlet         LHL1(Rocky Arm)         LHL2(Dix Dam)         LHL3 Cove         LHL 6 Cove							
Sample ID: e.g. (YOYBASS-001-LHL6), or (YOYBASS - 001TS - LHL6)	Sampling Location Description e.g. 50' north of CI2, west shore)	Sampling Method (Seine, Electrofish, Minnow Trap etc.)	Start Time (24hr clock)	Sampling Duration (in hrs)	Sample Size (N=)	No. in Photo <sup>a,b</sup> (N=)		
	Fallon Branch at waterful at back of inlet	Traps	0:00	10mins	1			
*	21							

b) For the YOY analytical subsample of approximately 10 YOY bass (minimum 5 grams total weight), detailed imagery will be captured of both the left and right sides of each individual (two photos) before they are frozen for shipment to the laboratory.

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		Lake Young-C			RA	MBCLL
Primary Fish Collect Sampling Date(s):		Notes:	FW2	Am Ar	rived in nued Ser	H2
Weather Forecast:		1	2 1400	- Comm	nver or	5
Air Temp: 20+ Wat	er Temp: - 18-f-80f		0~ ~	Jegn she	~ <del>,</del> C	
Curds Inlet	$\bigcirc$	ss Sampling Reg	ion (circle o 1L2(Dix Dam)		ove LHL	6 Cove
Sample ID: e.g. (YOYBASS-001-LHL6), or (YOYBASS - 001TS - LHL6)	Sampling Location Description e.g. 50' north of CI2, west shore)	Sampling Method (Seine, Electrofish, Minnow Trap etc.)	Start Time (24hr clock)	Sampling Duration (in hrs)	Sample Size (N=)	No. in Photo <sup>a,b</sup> (N=)
	Inner HQ Oback	Seine (3 hauks)	1300	1.068	40+10+10 ~= 60	
	H2 Wost Shore	(5 houls)	1400	0.5h1	n 20fish	
			~			
<u>Notes:</u> a) For unaffected YOY	Bass, a maximum of 100 ind	ividuals will fit wit	hin 20" X 10"	image field, pi	oviding detaile	d imagery of

both the left and right sides of the fish (two photos). b) For the YOY analytical subsample of approximately 10 YOY bass (minimum 5 grams total weight), detailed imagery will be captured of both the left and right sides of each individual (two photos) before they are frozen for shipment to the laboratory.

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		Lake Young-C			RA	MBCLL	
Primary Fish Collect	tor(s): AJS, FW	Notes:					
Sampling Date(s):	July 17th, 2018	1					
Weather Forecast:	808 Sunny						
Air Temp: 20fWat	er Temp: 826 J						
Curds Inlet	YOY Bass Sampling Region (circle one):           Curds Inlet         HQ Inlet           LHL1(Rocky Arm)         LHL2(Dix Dam)           LHL3 Cove         LHL 6 Cove						
Sample ID: e.g. (YOYBASS-001-LHL6), or (YOYBASS - 001TS - LHL6)	Sampling Location Description e.g. 50' north of CI2, west shore)	Sampling Method (Seine, Electrofish, Minnow Trap etc.)	Start Time (24hr clock)	Sampling Duration (in hrs)	Sample Size (N=)	No. in Photo <sup>a,b</sup> (N=)	
	Ha Inled hear water	Mirrow	1015	~25 \$\$51	~10		
	Ha Ind	Seine	1300	00	65		
Notes:							

a) For unaffected YOY Bass, a maximum of 100 individuals will fit within 20" X 10" image field, providing detailed imagery of

both the left and right sides of the fish (two photos). b) For the YOY analytical subsample of approximately 10 YOY bass (minimum 5 grams total weight), detailed imagery will be captured of both the left and right sides of each individual (two photos) before they are frozen for shipment to the laboratory.

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v		Lake Young-C COLLECTION E			RA	MBOLL			
Primary Fish Collec	tor(s): AJS, DJ	Notes:							
Sampling Date(s):	July 22, 2018	1							
Weather Forecast:	75 clardy	1							
Air Temp: 70 Wat	ter Temp: ~88	1							
	YOY Bass Sampling Region (circle one):								
Curds Inlet HQ Inlet LHL1(Rocky Arm) LHL2(Dix Dam) LHL3 Cove LHL 6 Cove						6 Cove			
Sample ID: e.g. (YOYBASS-001-LHL6), or (YOYBASS - 001TS - LHL6)	Sampling Location Description e.g. 50' north of CI2, west shore)	Sampling Method (Seine, Electrofish, Minnow Trap etc.)	Start Time (24hr clock)	Sampling Duration (in hrs)	Sample Size (N=)	No. in Photo <sup>a,b</sup> (N=)			
	LHL- 1. Rockyfork left fork@waterfall	Dip net	12 15	2	~570 +~190				
Notes:									

b) For the YOY analytical subsample of approximately 10 YOY bass (minimum 5 grams total weight), detailed imagery will be captured of both the left and right sides of each individual (two photos) before they are frozen for shipment to the laboratory.

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		Lake Young-C COLLECTION E			RA	MBCLL
Primary Fish Collect	or(s): ATS, FW	Notes:				
Sampling Date(s):	July 17th, 2018					
Weather Forecast:	807 Sunny					
Air Temp: 864 Wat	er Temp: v8lf					
	ҮОҮ Ва	ss Sampling Reg	ion (circle o	ne):	~	
Curds Inlet	HQ Inlet LHL1(Ro	ocky Arm) Lł	1L2(Dix Dam)	LHL3 C	ove LHL	6 Cove
Sample ID: e.g. (YOYBASS-001-LHL6), or (YOYBASS - 001TS - LHL6)	Sampling Location Description e.g. 50' north of CI2, west shore)	Sampling Method (Seine, Electrofish, Minnow Trap etc.)	Start Time (24hr clock)	Sampling Duration (in hrs)	Sample Size (N=)	No. in Photo <sup>a,b</sup> (N=)
	LHL 3 Innes Cove	Seine Net	1400	1,5	25	
Notes:						

a) For unaffected YOY Bass, a maximum of 100 individuals will fit within 20" X 10" image field, providing detailed imagery of both the left and right sides of the fish (two photos).
b) For the YOY analytical subsample of approximately 10 YOY bass (minimum 5 grams total weight), detailed imagery will be

b) For the YOY analytical subsample of approximately 10 YOY bass (minimum 5 grams total weight), detailed imagery will be captured of both the left and right sides of each individual (two photos) before they are frozen for shipment to the laboratory.

Page <u>|</u> of \_

		n Lake Young-C COLLECTION E			RA	MBCLL
Primary Fish Collect	tor(s): Forrest Alan	Notes:				
Sampling Date(s):	7-20-18	1				
Weather Forecast:	Sunny	1				
Air Temp: 72 Wat	er Temp: est mate 80-850					
	YOY Ba	ss Sampling Reg	ion (circle o	ne):	_	
Curds Inlet	HQ Inlet LHL1(R	ocky Arm) Li	HL2(Dix Dam)		ove) LHL	6 Cove
Sample ID: e.g. (YOYBASS-001-LHL6), or (YOYBASS - 001TS - LHL6)	Sampling Location Description e.g. 50' north of CI2, west shore)	Sampling Method (Seine, Electrofish, Minnow Trap etc.)	Start Time (24hr clock)	Sampling Duration (in hrs)	Sample Size (N=)	No. in Photo <sup>a,t</sup> (N=)
	LHL-3 cove	Seine	15:00	(3.5)	3	
<u>Notes:</u> a) For unaffected YOY	Bass, a maximum of 100 ind	ividuals will fit wit	hin 20" X 10"	image field, pi	roviding detaile	d imagery of

both the left and right sides of the fish (two photos).

b) For the YOY analytical subsample of approximately 10 YOY bass (minimum 5 grams total weight), detailed imagery will be captured of both the left and right sides of each individual (two photos) before they are frozen for shipment to the laboratory.

Page ⊥ of <u>1</u>

	FIS	on Lake Young-C H COLLECTION E			RA	MBOLL
Primary Fish Collect	tor(s): Forest Alan	Notes:				
Sampling Date(s):	7-22-18					
Weather Forecast:	Overcast (slighting!	0				
Air Temp: ~ 🔗 Wat	er Temp: estimate 80-8.	Se				
	YOY	Bass Sampling Reg	ion (circle o	ne):	-	
Curds Inlet	HQ Inlet LHL1(	Rocky Arm) Ll	HL2(Dix Dam)	LHL3 C	ove LHL	6 Cove
Sample ID: e.g. (YOYBASS-001-LHL6), or (YOYBASS - 001TS - LHL6)	Sampling Location Description e.g. 50' north of CI2, west shore)	Sampling Method (Seine, Electrofish, Minnow Trap etc.)	Start Time (24hr clock)	Sampling Duration (in hrs)	Sample Size (N=)	No. in Photo <sup>a,b</sup> (N=)
	LHL-3 cove	dip net	15:50	0.5 (30 mins)	2	
Notes:	Page 4					d improved

b) For the YOY analytical subsample of approximately 10 YOY bass (minimum 5 grams total weight), detailed imagery will be captured of both the left and right sides of each individual (two photos) before they are frozen for shipment to the laboratory.

Page  $\_$  of  $\_$ 

or(s): AJS, FW July 23, 2018 Clandy	Notes:				
Clandy	1				
er Temp: estimate 80°850					
YOY Bas	ss Sampling Reg	ion (circle o	ne):	_	
Curds Inlet HQ Inlet LHL1(Rocky Arm) LHL2(Dix Dam) LHL3 Cove LHL 6 Cove					
Sampling Location Description e.g. 50' north of CI2, west shore)	Sampling Method (Seine, Electrofish, Minnow Trap etc.)	Start Time (24hr clock)	Sampling Duration (in hrs)	Sample Size (N=)	No. in Photo <sup>a,b</sup> (N=)
LHL-3 cove	Traps	11:30	0.25	2	
	r Temp: <u>estimate</u> 80°859 YOY Bas HQ Inlet LHL1(Ro Sampling Location Description e.g. 50' north of C12, west shore)	r Temp: <u>estimate 80%850</u> YOY Bass Sampling Regination HQ Inlet LHL1(Rocky Arm) LH Sampling Sampling Location Description e.g. 50' north of C12, west shore) Method (Seine, Electrofish, Minnow Trap etc.)	r Temp:       Softward & S	Temp: OSI male 80%850         YOY Bass Sampling Region (circle one):         HQ Inlet       LHL1(Rocky Arm)       LHL2(Dix Dam)       LHL3 Colspan="2">LHL3 Colspan="2">LHL3 Colspan="2">LHL3 Colspan="2">Colspan="2">Colspan="2">LHL3 Colspan="2">Colspan="2">Colspan="2">Colspan="2">Colspan="2">Colspan="2">Colspan="2">Colspan="2">Colspan="2">Colspan="2"Colspan="2"Colspan="2"Colspan="2"Colspan="2"Colspan="2"Colspan="2"Colspan="2"Colspan="2"Colspan="2">Colspan="2"Colspan="2	T Temp: estimate 80%850         YOY Bass Sampling Region (circle one):         HQ Inlet       LHL1(Rocky Arm)       LHL2(Dix Dam)       LHL3 Cove       LHL         Sampling       Sampling       Start       Sampling       LHL3 Cove       LHL         Sampling       Sampling       Start       Sampling       Duration (in hrs)       Sample Size (N=)         shore)       How Trap etc.)       How Trap etc.)

b) For the YOY analytical subsample of approximately 10 YOY bass (minimum 5 grams total weight), detailed imagery will be captured of both the left and right sides of each individual (two photos) before they are frozen for shipment to the laboratory.

Page  $\underline{1}$  of  $\underline{1}$ 

	н		Lake Young-C COLLECTION E			R/A	MBCLL
Primary Fish Collect	or(s): ACS	FW	Notes:				
Sampling Date(s):	July 24,	7018					
Weather Forecast:	86tSun	ny					
Air Temp: 36 Wat	er Temp: 827	<i>E</i> I					
		YOY Bas	ss Sampling Reg	ion (circle or	1e):	~	
Curds Inlet	HQ Inlet	LHL1(Ro	ocky Arm) Lł	IL2(Dix Dam)		DVe LHL	6 Cove
Sample ID: e.g. (YOYBASS-001-LHL6), or (YOYBASS - 001TS - LHL6)	Samplin Location Des e.g. 50' north of shore)	cription CI2, west	Sampling Method (Seine, Electrofish, Minnow Trap etc.)	Start Time (24hr clock)	Sampling Duration (in hrs)	Sample Size (N=)	No. in Photo <sup>a,I</sup> (N=)
	LHL3 CO	ne	mmon Traps (1)	ል 1			
	LHL3 N		(7)	1800 745AU	141	Coning ac	lults)
	li	×	Geine Neti (1pm	ų)	.lshr	0	
	LHL3MC NS	فمر	"(2 pull	»)	.shr	0	
*							
- <sup>-</sup> -							
Notes:							

b) For the YOY analytical subsample of approximately 10 YOY bass (minimum 5 grams total weight), detailed imagery will be captured of both the left and right sides of each individual (two photos) before they are frozen for shipment to the laboratory.

Page <u>|</u> of <u>|</u>

		n Lake Young-C COLLECTION E			RA	MBCLL
Primary Fish Collect Sampling Date(s): Weather Forecast:	Jul 26th, 2018	Notes:				
	er Temp: est. mate 80-85	3				
		ss Sampling Reg	ion (circle o	ne):		
Curds Inlet	The true		IL2(Dix Dam)		ove LHL	6 Cove
Sample ID: e.g. (YOYBASS-001-LHL6), or (YOYBASS - 001TS - LHL6)	Sampling Location Description e.g. 50' north of CI2, west shore)	Sampling Method (Seine, Electrofish, Minnow Trap etc.)	Start Time (24hr clock)	Sampling Duration (in hrs)	Sample Size (N≃)	No. in Photo <sup>a,</sup> (N=)
	Both Banks of	Electro Stock	1330	1.0	41	
				- <del>1 1 3 685/</del>		
						-
					÷	
×						

) For unaffected YOY Bass, a maximum of 100 individuals will fit within 20" X 10" image field, providing detailed imagery of both the left and right sides of the fish (two photos). b) For the YOY analytical subsample of approximately 10 YOY bass (minimum 5 grams total weight), detailed imagery will be

captured of both the left and right sides of each individual (two photos) before they are frozen for shipment to the laboratory.

Page 📙 of 📕

		Lake Young-C			RA	MBCLL
Sampling Date(s): Weather Forecast: Air Temp: 🏹 🗸 Wat	er Temp: 824	Notes:				
Curds Inlet	to the	ss Sampling Reg ocky Arm) Lł	ion (circle o HL2(Dix Dam)	-	ove LHL	6 Cove
Sample ID: e.g. (YOYBASS-001-LHL6), or (YOYBASS - 001TS - LHL6)	Sampling Location Description e.g. 50' north of CI2, west shore)	Sampling Method (Seine, Electrofish, Minnow Trap etc.)	Start Time (24hr clock)	Sampling Duration (in hrs)	Sample Size (N=)	No. in Photo <sup>a,t</sup> (N=)
	HI near port vor mp	Jeine Nel	1800	. Shr	~230	
	21					
Notes:						

a) For unaffected YOY Bass, a maximum of 100 individuals will fit within 20" X 10" image field, providing detailed imagery of

both the left and right sides of the fish (two photos). b) For the YOY analytical subsample of approximately 10 YOY bass (minimum 5 grams total weight), detailed imagery will be captured of both the left and right sides of each individual (two photos) before they are frozen for shipment to the laboratory.

Page 🔟 of 🔟

			Lake Young-C			R.A	MBGLL.
Primary Fish Collect Sampling Date(s):	or(s): AJS. Jul 25,7	18 18	Notes:				
Weather Forecast:	Sunny	1					
Air Temp: 70° Wat							
Curds Inter	DIN INLET HQ Inlet		ss Sampling Reg ocky Arm) Lł	ion (circle oi 1L2(Dix Dam)		ove LHL	6 Cove
Sample ID: e.g. (YOYBASS-001-LHL6), or (YOYBASS - 001TS - LHL6)	Sampl Location De e.g. 50' north c shore	scription of CI2, west	Sampling Method (Seine, Electrofish, Minnow Trap etc.)	Start Time (24hr clock)	Sampling Duration (in hrs)	Sample Size (N=)	No. in Photo <sup>a,b</sup> (N=)
	Boad	Rom 30'right	zeine (2) pulls	830au	,5	. 0	
2		n.					
	2 X1	<					
	÷.						
Notes:							

b) For the YOY analytical subsample of approximately 10 YOY bass (minimum 5 grams total weight), detailed imagery will be captured of both the left and right sides of each individual (two photos) before they are frozen for shipment to the laboratory.

Page *L* of \_

		Lake Young-C COLLECTION E			RA	MBOLL
Primary Fish Collect Sampling Date(s):	P P P P P	Notes: direction	s (left	(right) i	s determ	ined by
Weather Forecast:		looking	in her the	e cu oli	10t	
Air Temp: ~650 Wate		rooting	INTO IN	- Cover w	101	
	YOY Ba	ss Sampling Reg	ion (circle o	ne):		×
Curds Inlet	HQ Inlet LHL1(Ro	ocky Arm) Lł	1L2(Dix Dam)	LHL3 Co	ove LHL	6 Cove
Sample ID: e.g. (YOYBASS-001-LHL6), or (YOYBASS - 001TS - LHL6)	Sampling Location Description e.g. 50' north of CI2, west shore)	Sampling Method (Seine, Electrofish, Minnow Trap etc.)	Start Time (24hr clock)	Sampling Duration (in hrs)	Sample Size (N=)	No. in Photo <sup>a</sup> (N=)
	been 300 ft left of water fall at end of cove	dip net	ci:50	2 hrs 10 nin	а <b>д</b> Ам, 109	
	500 A left of waterfall atend of cove	Seine	12:05	2 hrs	392	
	At workerfall out end o E cove	traps	9:30	30min	11	
an tra			-	•		
2						
-					¢	
	2					

b) For the YOY analytical subsample of approximately 10 YOY bass (minimum 5 grams total weight), detailed imagery will be captured of both the left and right sides of each individual (two photos) before they are frozen for shipment to the laboratory.

Page \_ of \_

Sampling Date(s):		Notes: divection looking in	ns (lef	t, right) ave/miet	determine	ed by
		s Sampling Regi	on (circle or	ne):	-	
Curds Inlet	HQ Inlet LHL1(Ro	cky Arm) Lł	IL2(Dix Dam)	LHL3 Co	ove LHL	6 Cove
Sample ID: e.g. (YOYBASS-001-LHL6), or (YOYBASS - 001TS - LHL6)	Sampling Location Description e.g. 50' north of CI2, west shore)	Sampling Method (Seine, Electrofish, Minnow Trap etc.)	Start Time (24hr clock)	Sampling Duration (in hrs)	Sample Size (N=)	No. in Photo <sup>a,</sup> (N=)
	Small cove on right Mon heading into LAI-6 cove	traps	9:35	20mins	12	
	11	dsp net	9:55	Lonins	8	
	left bank 230000 Examuaterkan	Seine	10:15	20 mins	504	
	×					
both the left and righ	Y Bass, a maximum of 100 ind t sides of the fish (two photo tical subsample of approxima left and right sides of each in	S).	(minimum F c	irams total wei	oht), detailed i	magery will be

Page 1 of 1

.

Attachment I1-2: Completed Young-of-the-Year (YOY) Bluegill Assessment Samples: Group Health Examination Forms

_	e Young-Of-The-Y XAMINATION FO	-	DY)		RAMB	GLL
Recorder: h	in		Notes:			
Primary Fish Hea	Ith Assessor: 10	the	7			
Third-Party Asses	sor:					
Assessment Date		/	# of YOY in samp	le: (()	Of assess	d 600
YOY Fish Samplin	7~1,-103	Snecies	s distribution in sa		1 0014	
Voper Cur	The and the		0% percent largem		s):	
	(no visible deformi	ties): S	595		Assessment Guide for YOY	Contrarchidan
Fish Anatomy	Anatomical Anomaly	# of fish	Anatomical Anomaly	# of fish	Eye abnormalities - includir exophthalmos	ng lens cataracts and
	I. Even beth newsels	600		11511	Fin irregularities - missing, missing (aka vestigial)	misshaped, partly
	Eyes both normal: Left	600	Right		Coinel supjeture - kupheric	lordorin and
	normal:	/	normal:		Spinal curvature - kyphosis scoliosis	, lordosis, and
Eyes	exophthalmic;	/	exophthalmic;	/	Craniofacial defects - mou	th iaw and gill cover
-	opaque:		opaque:		Edema - fluid accumulation	
	missing:		mjssing:		Note: To avoid multiple-co	unting of fish with
	Other (list):		Other (list):		multiple deformities, this fo	orm counts the
					prominent deformity and d details of specific fish will a	0 0
		+051				
	Fins all normal:	200	Caudal fin (	(tail)	Anatomical	#
	Left pectora		partly missing:		Anomaly	of fish
	partly missing:	/	missing:	a		
Fins	missing:	/	Downtwisted:	5	Dorsal	fin
	twisted:	-	Anal fir	-	partly missing:	
	Right pector	aı	-		missing: twisted:	/
	partly missing: missing:		partly missing: missing:	/	fins other (list).	/
	twisted:		twisted:	r		
		a chi			I	600
	Spine normal:	775	(per		Head Normal:	600
Spine	kyphosis		Craniofac	ial	mouth	
_	lordosis:				jaw:	
	scoliosis: Other (list):				gill cover: Other (list):	
	 	600	J L	d	l	
	normal:	au	-	ſ		caudal fin
Edema	Edema:		- Fin Mem	ibrane	7 spines	(tail)
	Other (list):	1	upper jaw bone nape	effektelet ber et der	Survey of States	soft rays
			Eye	And A more	Contraction of the owner o	all and a
Other (List)		Č.	Contraction of the second	Lateral Li	ne Caud <u>al Pedun</u>	cle
Other (List)			Cheek		- inc	100 m
			lower jaw		anus y	12
			(throat) gill cover gill flap	K	Nr. J	
				ectoral fin pel	vic fin anal spines anal (	fin
Page of	/		Length is measured from tin of	flower jaw to tin of t	ail with fish laid flat and tail lobes sq	lucezed together
			···· ··· ···	,,		

Recorder: W	u-		Notes:	. î	_ /	
Primary Fish Hea	Ith Assessor: $\mathcal M$	/	674 total v 93 exophth	eview	2-1	
Third-Party Asses	sor:	STF.	93 exodith	alissur	-Skimeye	issue
Assessment Date	(s): 8/24,27,28/	18	# of YOY in samp	le: 67	79-10-1-	
YOY Fish Samplin Mid CL	g Location:		distribution in sa % percent largen		:):	
# of Normal Fish	(no visible deform	ities):	76		Assessment Guide for YOY	Centrarchidae
Fish Anatomy	Anatomical Anomaly	# of fish	Anatomical Anomaly	# of fish	Eye abnormalities - includin exophthalmos Fin irregularities - missing, r	-
	Eyes both normal:	581			missing (aka vestigial)	
	Left		Right		Spinal curvature - kyphosis,	lordosis, and
10	normal:		normal:		scoliosis	
Eyes	exophthalmic:	93	exophthalmic:	93	Craniofacial defects - mouth, jaw, and gill cov	
2.6	opaque:	087	opaque:		Edema - fluid accumulation	
	missing:		missing:		Note: To avoid multiple-cou multiple deformities, this fo	-
	Other (list):		Other (list):		prominent deformity and di details of specific fish will a	gital images and
	Fins all normal:	613	Caudal fin	(tail)		#
	Left pectora	al p	partly missing:		Anatomical Anomaly	of
	partly missing:		missing:			fish
Fins	missing:		twisted:		Dorsal	fin
	twisted:	V			partly missing:	
	Right pector	al	Anal fir	ו ו	missing:	
	partly missing:		partly missing:		twisted: fins other (list):	
	missing: twisted:		twisted:			
						123
	Spine normal:	~			Head Normal:	675
Spine	kyphosis lordosis:	V	Craniofac	ial hel	mouth UDD-v/jaw:	12 Der
	scoliosis:	1-2	a near		gill cover:	-
	Other (list):		Senerally Children		Other (list):	· · · · · · · · · · · · · · · · · · ·
			° st	201057		
	normal:	670	V	du	orsal fin	
	Edema:	91				caudal fi
Edema			Fin Mem	ibrane	A STATISTICS	oft rays \
Edema	I Other (list)		upper jaw bone nape	allerin an	Trent of	12
Edema	Other (list):	/				
Edema	Other (list):		Eye	Ser Barris	Caudal Pedure	A Stranger
Edema Other (List)	Other (list):		Eye	Lateral Lin	a Caudal Peduno	le
	Other (list):		Eve Cheek	Lateral Lin	a Caudal Pedunc	tet de la companya de
	Other (list):		Eve Cheek Iower jaw Isthmus (throat)	1	a Caudal Peduno	le l

4

Recorder: // Primary Fish Healt Third-Party Assess Assessment Date( YOY Fish Sampling Lover Co # of Normal Fish ( Fish Anatomy	sor: (s):	W	Notes:	6		
Third-Party Assess Assessment Date( YOY Fish Sampling Lover Co # of Normal Fish (	sor: (s):	4V				
Assessment Date( YOY Fish Sampling Lover Co # of Normal Fish (	s): <u>8/30/18</u> g Location:					n A Is
YOY Fish Sampling しいやくしい # of Normal Fish (	g Location:		3 abrond.	told	482	fortal -
Lover Cu # of Normal Fish (			# of YOY in samp	-	Det	Stexel 6
Lover Cu # of Normal Fish (		Species	distribution in sa	nnle		330340
# of Normal Fish (			0% percent largem		s):	
			1			
FISH Anatomy	Anatomical	# of	Anatomical	#	Assessment Guide for YOY ( Eye abnormalities - includin exophthalmos	
	Anomaly	fish	Anomaly	of fish	Circles and a state of a start of	
	Eyes both normal:	595	LOGO VID	11311	Fin irregularities - missing, n missing (aka vestigial)	nisshaped, partly
-	Lyes both horman	515	Right		Spinal curvature - kyphosis,	lordoric and
-	normal:				scoliosis	lordosis, and
Eyes	exophthalmic:		exophthalmic:	1	Craniofacial defects - mout	h jaw and sill cover
ŀ	opaque:		opaque:		Edema - fluid accumulation	ה, זמש, מוום צוו נטעפו
ł	missing:		missing:		Note: To avoid multiple-cou	nting of fish with
f	Other (list):		Other (list):		multiple deformities, this fo	rm counts the
					prominent deformity and di details of specific fish will al	
		c.A.				
Ļ	Fins all normal:	Ste	4 Caudal fin (	tail)	Anatomical	#
-	Left pectora	r /	partly missing:		Anomaly	of
_	partly missing:	/_	missing:	-50		fish
Fins	missing:	_/	Doron twisted:	-1-	Dorsal	fin
-	twisted:				partly missing:	
-	Right pectors	a1	Anal fin	1	missing:	
-	missing:		partly missing: missing:	-/-	twisted: fins other (list):	
	twisted:		twisted;	/		
	6	100				
-	Spine normal:	414			Head Normal:	
Spine	kyphosis	0	Craniofac	al	mouth	
-	lordosis:				jaw:	
F	scoliosis: Other (list):	2			gill cover:	
					Other (list):	
					orsal fin	
	normal:				1	
Edema	Edema:		Fin Memt	rane 15	spines	caudal fin (tail)
	Other (list):		upper jaw bone nape	Gestellet feb & Co	So So	ft rays
			Eye		and the second se	
Other (List)			× ·····	Lateral Lin	e Caudal Pedunci	e
Other (List)			Cheek			
			lower jaw		anus y	
F			(throat) gill cover gill flap	1 ~	CX S	
				ctoral fin pel	vic fin anal spines anal fin	1

Recorder: M	41	RW	Notes: AA	0	N-J.	*	
Primary Fish Heal	<u></u>		Wion	y co	te fish	iv-	
hird-Party Asses	1.00		poor	werg	al condition	n	
		how	# of YOY in sam	mid "	83		
Assessment Date	1	<u> </u>		0	0.7		
OY Fish Samplin) אל אלי	et Not Shirt		distribution in sa % percent large		55):		
# of Normal Fish	(no visible deformi	ties): _	279		Assessment Guide for YOY C	entrarchidae	
Fish Anatomy	Anatomical Anomaly	# of fish	Anatomical # Anomaly fish		Eye abnormalities - includin exophthalmos Fin irregularities - missing, n		
	Eyes both normal:	282			missing (aka vestigial)		
	Left		Righ	- /	Spinal curvature - kyphosis,	lordosis, and	
	normal:		normal	:/	scoliosis		
Eyes	exophthalmic:		exophthalmic	:	Craniofacial defects - mout	h, jaw, and gill cover	
	opaque:	*	opaque	:	Edema - fluid accumulation		
	missing:		missing	:	Note: To avoid multiple-counting of fish wi multiple deformities, this form counts the		
	Other (list):		Other (list):		prominent deformity and digital images and		
					details of specific fish will al	so be recorded.	
	Fins all normal: -273 Left pectoral partly missing:		Caudal fin	(tail)		# /	
			partly missing:		Anatomical Anomaly	of	
1.000 <b>a</b> 1			missing:		fish		
Fins M	missing:	/	twisted	: /	Dorsal	fin	
Seventy	twisted;	/			partly missing;		
corel	Right pector	al	Anal fin		missing:		
Coting	partly missing:		partly missing	partly missing:			
Conder to g	missing:		missing	:	fins other (list):		
Fins for sovel in sovel conditions little trans	twisted:		twisted	:			
	Spine normal:	281			Head Normal:	252	
	kyphosis		]]		mouth	2	
Spine	lordosis:	73	Craniofa	ciai	jaw:		
	scoliosis:	T_			gill cover:		
	Other (list):	10			Other (list):		
		0.00					
	normal:	283		[	dorsal fin		
Edema	Edema:		- Fin Me	mbrane / /	spines	caudal fi (tail)	
	Other (list):	1	upper jaw bone nape	-	Star St	oft rays	
					and the second s	(2)	
		Y	A States and	Lateral	Line Caudal Peduno	le	
Other (List)			Cheek .	· · · ·		-	
			lower jaw	2	and the second s		
			isthmus		anus		
			(throat) ( gill cover gill flap				

FISH HEALTH E	XAMINATION FO	RM			RAMB	1
Recorder: 🛛 🕅	ma		Notes:	bet	to condi	tom
Primary Fish Hea	Ith Assessor: Pla	$\sim$	Jul t	HA	ant of 1	10
Third-Party Asses	sor:		than "	AL	not shoet	xegl
Assessment Date	(s): 8/24/18		# of YOY in sampl	e: /7	23 + 30 poss	sible 6-3
YOY Fish Samplin	g Location:		distribution in sar )% percent largem		908 BC- s):109 Vod	ecr
t of Normal Fish	(no visible deformi	L			Assessment Guide for YOY C	
Fish Anatomy	Anatomical Anomaly	# of fish	Anatomical Anomaly	# of fish	Eye abnormalities - includin exophthalmos Fin irregularities - missing, n	glens cataracts and
	Eyes both normal:	17×2	3		missing (aka vestigial)	
	Left	19.50	Right	6	Spinal curvature - kyphosis,	lordosis, and
	normal:	/	normal:		scoliosis	
Eyes	exophthalmic;	/	exophthalmic:		Craniofacial defects - mout	h, jaw, and gill cove
	opaque:		opaque:		Edema - fluid accumulation	
	mizsing:		missing:		Note: To avoid multiple-cou multiple deformities, this fo	-
	Other (list).		Other (list):		prominent deformity and di	gital images and
		703			details of specific fish will al	so be recorded.
	Fins all normal:	173	Caudal fin (	tail)		#
	Left pector	al	partly missing:		Anatomical Anomaly	of
	partly missing:	/	missing:			fish
Fins	missing:		twisted:		Dorsal	fin
	twisted:				partly missing	
	Right pector	al	Anal fin	<u> </u>	miseing:	
	partly missing:		partly missing:		fins other (list):	
	missing:	-	missing:			
	twisted:	203	twisted:	4		
	Spine normal:	AS			Head Normal:	
Spine	kyphosis	R	Craniofac	ial	mouth	
	lordosis:	VU	1		jaw: gill cover:	
	scoliosis Other (list):				Øther (list):	
		203				
	normal:	173		[	dorsal fin	
Edema	Edema.	~	Fin Mem	brane	spines	caudal f (tail)
	Other (list):		upper jaw bone nape	dilline for	Sale S	oft rays
					and the second s	
			Xon hand	Lateral	ine Caudal Peduno	leption
Other (List)	/		Cheek A			-
			lower jaw		anus y	
÷			(throat)	In	- 4 - J	
			gill cover gill flap	ectoral fin	elvic fin anal spines anal f	in

Cound recapion with the recent rec	rective Action Site Investion	gation, Source Assessmen	t, and Risk /	Assessment Report		a l (	1- 1. 1
Herrington Lake Young-Of-The-Year (YOY)       INTEGED         FISH HEALTH EXAMINATION FORM       Notes:       \$500 Tail 4 for through the seconder:         Weeconder:       Weeconder:       Weeconder:       Weeconder:       Weeconder:         Primary Fish Health Assessor:       Weeconder:	Count r	easesel /	18/19 1	afer verie	no of	5 photosp	la pode
Primary Fish Health Assessor:       Iff         Primary Fish Health Assessor:       Iff         Assessment Date(s):       S/C - S/L/Act, # of VOY in sample:       S/S         Assessment Date(s):       S/C - S/L/Act, # of VOY in sample:       S/S         (e.g. 80% percent largemouth bass):       Iff         # of Normal Fish (no visible deformities):       S/Z         # of Normal Fish (no ormal:       * of Anomaly         # of Normal Fish (normal:       S/Z         # cophthalmultic       If anomaly         # copful:       g/duc:       S/Z         # of Normal:       Caudal fin (tail)         # normal:       Caudal fin (tail)       Anatomical         # cophthalmultic       If anormal:       Caudal fin (tail)       Anatomical         # fins       Informising:       Informal fing       Informal fing <th>Herrington Lake</th> <th>e Young-Of-The-Y</th> <th>ear (YC</th> <th></th> <th></th> <th></th> <th></th>	Herrington Lake	e Young-Of-The-Y	ear (YC				
Assessment Date(s):       S/// - S/// 2015, # of YOY in sample:       S/// 2015, # of YOY in sample:         YOY Fish Sampling Location:       [e.g. 80% percent largempic to sample:       S/// 2015, # of S//// 2015, # of S////// 2015, # of S////// 2015, # of S///////////////////////////////////	Recorder: N	i L			6 Tail	e fin to	anna
Assessment Date(s):       S/// - S/// 2015, # of YOY in sample:       S/// 2015, # of YOY in sample:         YOY Fish Sampling Location:       [e.g. 80% percent largempic to sample:       S/// 2015, # of S//// 2015, # of S////// 2015, # of S////// 2015, # of S///////////////////////////////////	Primary Fish Heal	ith Assessor: 1213	6	often	in p	borweit	lit.
Assessment Date(s):       S/// - S/// 2015, # of YOY in sample:       S/// 2015, # of YOY in sample:         YOY Fish Sampling Location:       [e.g. 80% percent largempic to sample:       S/// 2015, # of S//// 2015, # of S////// 2015, # of S////// 2015, # of S///////////////////////////////////	Third-Party Asses	sor: ,		cond	itian	-, Ildefor	na total
# of Normal Fish (no visible deformities):       2.973       Assessment Guide for CVC Centrandides in the description of the descriptio	Assessment Date	(s): 8/12 - 8/2	shois				
Fish Anatomy       Anatomical Anomaly       # of fish       Anatomical Anomaly       # of fish       Developmentations       Developmentations         Eyes       Eyes both normal:       572       Intrautional (State Control)       Spine (Verture - harded, party missing late vestige)       Nor., "Fra. Anacomical normal:       Spine (Verture - harded, party missing late vestige)         Eyes       exophthalmy:       exophthalmy:       Right       Spine (Verture - harded, party missing)         Eyes       exophthalmy:       exophthalmy:       exophthalmy:       Spine (Verture - harded, party missing)         Other (list):       mormal:       Spine (Verture - harded, party missing):       Normal       Spine (Verture - harded, party missing):         Fins       Binsing:       Tra. Anacomidation       Normal       Spine (Verture - harded, party missing):         Fins       Binsing:       Caudal fin (tail)       Anatomical missing:       #         All       Fins all normal:       Spine       Caudal fin (tail)       Anomaly partly missing:       #         Fins       missing:       partly missing:       fins other (list):       Dorsal fin         Spine       Right pectoral partly missing:       partly missing:       fins other (list):       Spine         Spine       Spine normal:       SS       SS <t< td=""><td>YOY Fish Samplin LH</td><td>g Location:</td><td></td><td></td><td></td><td>;): 100 % BL</td><td>negill</td></t<>	YOY Fish Samplin LH	g Location:				;): 100 % BL	negill
Fish Anatomy       Anatomical Anomaly       # of fish       Anatomical Anomaly       # of fish       Developmentations       Developmentations         Eyes       Eyes both normal:       572       Intrautional (State Control)       Spine (Verture - harded, party missing late vestige)       Nor., "Fra. Anacomical normal:       Spine (Verture - harded, party missing late vestige)         Eyes       exophthalmy:       exophthalmy:       Right       Spine (Verture - harded, party missing)         Eyes       exophthalmy:       exophthalmy:       exophthalmy:       Spine (Verture - harded, party missing)         Other (list):       mormal:       Spine (Verture - harded, party missing):       Normal       Spine (Verture - harded, party missing):         Fins       Binsing:       Tra. Anacomidation       Normal       Spine (Verture - harded, party missing):         Fins       Binsing:       Caudal fin (tail)       Anatomical missing:       #         All       Fins all normal:       Spine       Caudal fin (tail)       Anomaly partly missing:       #         Fins       missing:       partly missing:       fins other (list):       Dorsal fin         Spine       Right pectoral partly missing:       partly missing:       fins other (list):       Spine         Spine       Spine normal:       SS       SS <t< td=""><td># of Normal Fish</td><td>(no visible deformi</td><td>ities): &lt;</td><td>524-11 2 51</td><td>'3</td><td>Assessment Guide for YOY</td><td>Centrarchidae</td></t<>	# of Normal Fish	(no visible deformi	ities): <	524-11 2 51	'3	Assessment Guide for YOY	Centrarchidae
Fish Anatomy       Anomaly       of fish       Anomaly       of fish       Inverguanties - missing, mishaped partly mising (dai vertigia)       Non_/ Transmissing, mishaped partly mising (dai vertigia)       Non_/ Transmissing mising (dai vertigia)       Non_/ Transmissing (dai vertigia)       N					#	· ·	g lens cataracts and
Eyes both normal:       SYZ       mesong (ake vertige)       Non-Aracuse - explosis, londous, and scale out out and the explosite, londous, and scale out out and the explosite out out and the explosite. The explosite out out and the exp	Fish Anatomy						
Eyes       Eyes       Find and a second a sec			11	1 C-12	TISN	Fin irregularities - missing, r missing (aka vestigial)	Nisshaped, partly
Eyes       normal       normal       sclouisi         exophthalmy       graque:       sclouisi         graque:       gradue:       graque:         gradue:       gradue:       gradue:         gradue:       gradue:			534	-	/	-	
Eyes       exophthalmy       exophthalmy       exophthalmy       resuper the second of th	$\sim$		MAR				lordosis, and
Output:     Optimized product:     Optimized production       initial commutation     initial commutation       initial commutation     initial commutation <td>Eves</td> <td></td> <td>V</td> <td></td> <td>11 PC</td> <td>Francia celerts -)mout</td> <td>h iaw, and gill cover</td>	Eves		V		11 PC	Francia celerts -)mout	h iaw, and gill cover
missing:       missing:       Note: To avoid multiple counting of fish with multiple deformation. this form counts the provine deformation and getail mages and details of specific fish will also be recorded.         All frin       Fins all normal:       Stores       Caudal fin (tail)       Anatomical fish (tail)       #         All frin       Left pectoral       partly missing:       Missing:       Anatomical fish (tail)       #         Fins       missing:       twisted:       Dorsal fish (tail)       Anatomical fish (tail)       #         Fins       missing:       twisted:       partly missing:       fins other (list):       #         worder       Right pectoral       partly missing:       fins other (list):       #       #         worder       missing:       fins other (list):       #       #       #         worder       Spine normal:       Stores       #       #       #         spine       Spine normal:       Stores       #       #       #       #         spine       normal:       Stores       #       #       #       #       #       #       #       #         with definition       missing:       fins other (list):       fins other (list):       #       #       #       #       #			A		10.00		
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ISSUEs       partly missing:       missing:       Anomaly       fish         Fins       missing:       twisted:       Dorsal fin         appear       Right pectoral       Anal/fin       missing:         partly missing:       partly missing:       missing:       twisted:         partly missing:       partly missing:       missing:       twisted:         partly missing:       missing:       fins other (list):       twisted:         twowcord       Spine normal:       State       Mouth       mouth         spine       Spine normal:       State       Mouth       mouth       mouth         scoliosis:       /       ////////////////////////////////////	ALLE					Anatomical   _ /	
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Warden       missing:       fins other (list):         Tawwei er       Spine normal:       Statut       fins other (list):         Spine       Spine normal:       Statut       Head Normal:       Statut         Spine       Spine normal:       Statut       Head Normal:       Statut         Spine       Spine normal:       Statut       Head Normal:       Statut         Spine       Index scale       Craniofacial       Head Normal:       Statut         Spine       Index scale       Statut       Graniofacial       Index scale       Index scale         Edema       normal:       Statut       Statut       Index scale       Statut       Index scale         Statut       Index scale       Index scale       Statut       Index scale       Index scale       Index scale         Statut       Index scale       Index scale       Index scale       Index scale       Index scale       Index scale         Statut       Index scale       Index scale       Index scale       Index scale       Index scale       Index scale         Statut       Index scale         Stat				Anal fir	1		
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Spine       Spine normal:       Spine         kyphosis       Iordosis:       /         lordosis:       /       jaw:         scoliosis:       /         Other (list):       Other (list):       Other (list):         Edema       normal:       ST3         dorsal fin       total fin         Stomad       Other (list):       ST3         Other (List)       other (list):       Stomad         Gill cover (list)       Image: spines       caudal fin         Stomad       Image: spines       caudal fin         Gill cover (list)       Image: spines       caudal fin         Stomad       Image: spines       caudal Reduncte         Stomad       Image: spines       caudal Reduncte         Stomad       Image: spines       caudal Reduncte         gill cover gill fin       pectoral fin       anus spines       anal spines         gill cover gill fin       pectoral fin       anal spines       anal fin	varden	0. missing:		missing:		fins other (list):	
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Spine       kyphosis       mouth       mouth         Iordosis:       /       /       jaw:       jaw:         Scoliosis:       /       /       gill cover:       Z         Other (list):       Other (list):       Other (list):       Other (list):       Stort addition         Edema       normal:       Stort       Stort addition       caudal fin         Stort add       Other (list):       /       /       /       /         Stort add       /       /       /       /       /       /         Stort add       /       /       /       /       /       /       /         Stort add       /       /       /       /       /       /       /       /         Stort add       /       /       /       /       /       /       /       /         Stort add       /       /       /       /       /       /       /       /       /       /         Stort add       /       /       /       /       /       /       /       /       /       /         Stort add       /       /       /       /       /       / <t< td=""><td></td><td>Spine normal:</td><td>578</td><td>-</td><td></td><td>Head Normal:</td><td>828 50</td></t<>		Spine normal:	578	-		Head Normal:	828 50
Iordosis:	<b>C</b> - <b>1</b>	kyphosis				mouth	4
Other (list):     Other (list):       Edema     normal:       Edema     Edema:       Other (list):     ST3       dorsal fin     spines       caudal fin       Other (list):     upper jaw bone       nape     soft rays       Stamad     Image: Stamade       Other (List)     Image: Stamade       Stamad     Image: Stamade       Stamad     Image: Stamade       Stamade     Image: St	Spine	lordosis:	1	Craniofac	al		
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Edema       Edema:       Sto         Other (list):       upper jaw bone       nape         Stomach       Image: Stomach       Image: Stomach         Other (List)       Image: Stomach       Image: Stomach         Stomach       Image: Stomach       Image: Stomach       Image: Stomach       Image: Stomach         Stomach       Image: Stomach       Image: Stomach       Image: Stomach       Image: Stomach       Image: Stomach         Stomach       Image: Stomach       Image: Stomach       Image: Stomach       Image: Stomach       Image: Stomach         Stomach       Im				Į		1	iose dent
Edema     Luerna.       Other (list):     upper jaw bone       Other (List)     upper jaw bone       Through     Image: Stand of the			535	575	<u>d</u>	orsal nn	
Other (List)     upper jaw bone     nape       Wrough     Image     Image       Stornach     Image     Image       Other (List)     Image     Image       Stornach     Image       Stornach<	Edema		-/-	- Fin Mem	brane /		(tail)
Stomach Other (List) through Gill cover gill flap pectoral fin pelvic fin anal spines anal fin		Other (list):	$\swarrow$	upper jaw bone nape	Hillicht Car	Strange S	soft rays
Other (List)     Image: Constraint of the second seco	(Longel			Eye	5-31° J. 31° J.	Contraction of the owner owner owner owner own	
Sill cover gill flap pectoral fin pelvic fin anal spines anal fin			1	Xo and	Lateral Lin	Caudal Pedun	cle
Sill cover gill flap pectoral fin pelvic fin anal spines anal fin	Harouch		-/	100 M	*		
gill cover gill flap pelvic fin anal spines anal fin				isthmus		anus	
pectoral fin anal spines anal in	811			gill cover gill flap		vic fin	-
	<b>~</b>			l F	ectoral fin	anal spines anal t	ān .

Recorder: WeC	Recorder: MC					
Primary Fish Heal	th Assessor: 1/2/0	l				
Third-Party Assess	sor:					
Assessment Date(	s): 9/11-12/1	ř	# of YOY in samp	le		
YOY Fish Sampling Hardins 7			s distribution in sau 0% percent largem			
# of Normal Fish (	no visible deform	nities): _				
Fish Anatomy	Anatomical	# of	Anatomical			

asses ple outh bass): Assessment Guide for YOY Centrarchidae Eye abnormalities - including lens cataracts and # exophthalmos of fish fish Fin irregularities - missing, misshaped, partly missing (aka vestigial) 3 0 Eyes both normal: Left Right Spinal curvature - kyphosis, lordosis, and scoliosis normal: normal: Eyes exophthalmic: 106 exophthalmic: Craniofacial defects - mouth, jaw, and gill cover Edema - fluid accumulation opaque: opaque: missing: missing: Note: To avoid multiple-counting of fish with multiple deformities, this form counts the Other (list): Other (list): prominent deformity and digital images and details of specific fish will also be recorded. 2091 Caudal fin (tail) Fins all normal: # Anatomical Left pectoral of partly missing: Anomaly fish partly missing: missing: missing: **Dorsal fin** twisted: **Fins** twisted: partly missing: **Right pectoral** Anal fin missing: partly missing: partly missing: twisted fins other (Jist): missing: missing: twisted: twisted: OC 209 A Head Normal: Spine normal: kyphosis mouth Spine Craniofacial lordosis: jaw: gill cover: scoliosis, Other (list): Other (list): dorsal fin normal: caudal fin Edema: Edema DIRCS **Fin Membrane** (tail) soft rays Other (list): upper jaw bone nac Vn

Other (List) Deck befor Acres 2 Interview Interview

Page \_\_\_ of \_\_\_

Length is measured from tip of lower jaw to tip of tail with fish laid flat and tail lobes squeezed together

Recorder: 100	2h		Notes: Betler	coul	iten flom e	LALT
Primary Fish Heal	th Assessor: 1017	211		A	0	
hird-Party Asses	100	1	fallen	tok	.0	
Assessment Date		2hois	# of YOY in samp	le: 6	OF	
		1		v		
OY Fish Samplin	g Location:		distribution in same block percent largem		55):	
t of Normal Eich	/ no visible deformi		, o por contrar gen			
		#   #			Assessment Guide for YOY C Eye abnormalities - including	
Fish Anatomy	Anatomical	of	Anatomical	of	exophthalmos	
	Anomaly	fish	Anomaly	fish	Fin irregularities - missing, m	isshaped, partly
	Eyes both normal:	607	-	/	missing (aka vestigial)	
	Left	0.0.	Right		Spinal curvature - kyphosis,	ordosis, and
	normal:		normal:		scoliosis	
Eyes	exophthalmic:		exophthalmic:		Craniofacial defects - mouth	n, jaw, and gill cov
	opaque:		opaque:		Edema - fluid accumulation	
	missing:		missing:		Note: To avoid multiple-cou	-
	Other (list):		Other (list):		multiple deformities, this form counts the prominent deformity and digital images and	
					details of specific fish will als	so be recorded.
	Fins all normal:	607	Caudal fin (	(tail)	<u>т</u> т	#
	Left pectora		partly missing:	1	Anatomical	
partly missing: Fins missing:			missing:	/	Anomaly	of fish
		twisted/	1	Dorsal	fin	
	twisted:				partly missing;	/
	Right pector	al	Anal fin		missing:	
	partly missing;	ľ	partly missing:		twisted:	
	missing:		missing:		fins other (list):	
	twisted:		twisted:			
	Spine normal:	606	] [		Head Normal:	604
	kyphosis	0.0~~	11		mouth	
Spine	lordosis:		Craniofac	cial	jaw:	
	scoliosis:	1	11		gill cover:	1
	Other (list):		11		Other (list):	Lorthe
					1.5	
	normal:	607	1	· · · · ·	dorsal fin	
Edema	Edema:		-		spines	caudal
	Other (list):		- Fin Merr		A STATIS ON	(tail) oft rays /
			upper jaw bone nape	and the second	and the second sec	12
	/		Eye	1093719	Caudal Reduce	A Strategy of the second
Other (List)			Check A	Lateral	ine Caudal Pedunc	
Other (List)		P	lower jaw	1		
				and the second se	- The second sec	Sec.
			(threat)		anus	
			gill cover gill flap	pectoral fin	elvic fin anal spines anal fi	0

# APPENDIX I: ECOLOGICAL RISK ASSESSMENT (ERA) SUPPORTING INFORMATION

Attachment I1-3: Completed Young-of-the-Year (YOY) Bluegill Assessment Samples: Individual Assessment Forms



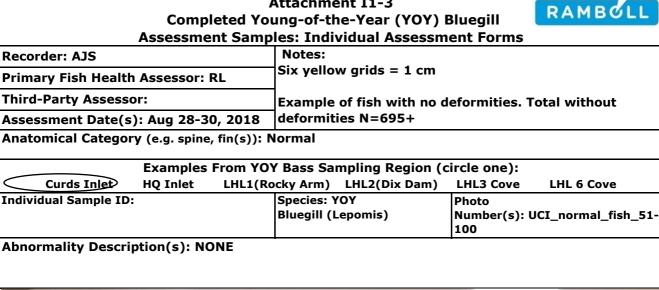
Assessment Samp	Dies: Individual Assessment Forms
Recorder: AJS	Notes:
Primary Fish Health Assessor: RL	Six yellow grids = 1 cm
Third-Party Assessor:	Example of fish with no deformities. Total without
Assessment Date(s): Aug 28-30, 2018	deformities N=695+
Anatomical Category (e.g. spine, fin(s)): I	Normal

Examples From YOY Bass Sampling Region (circle one):									
Curds Inlet	HQ Inlet	LHL1(Rocky Ar	n) LHL2(Dix Dam)	LHL3 Cove	LHL 6 Cove				
Individual Sample ID:		Specie	s: YOY	Photo					
		Bluegi	ll (Lepomis)	Number(s): L	JCI_normal_fish_1-				
				50					

### Abnormality Description(s): NONE

6	k	CU 408	ENT	NORMAL I	F 15 H		903	INB LOCA	CION!
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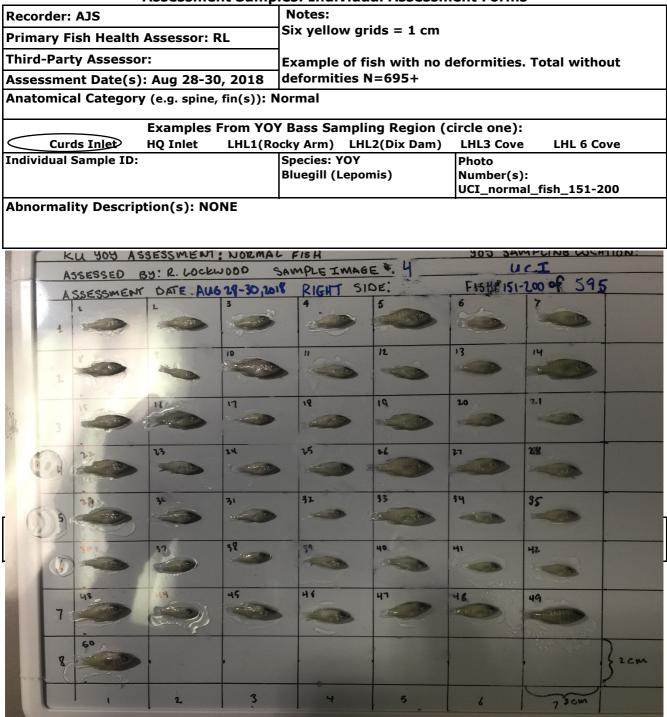
# **Attachment I1-3** Completed Young-of-the-Year (YOY) Bluegill



KU YOY ASS ASSESSED B	WOOD SAL	FISH MPLE IMAG	E . 2	405 SAU	1
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		: Individual Asse				
Recorder: AJS	Si	Notes: Six yellow grids = 1 cm				
Primary Fish Health Ass	essor: RL	Six yenow grias = 1 cm				
Third-Party Assessor:		Example of fish with no deformities. Total without				
Assessment Date(s): Au	g 28-30, 2018 de	formities N=695+				
Anatomical Category (e.						
	mples From YOY Ba Inlet LHL1(Rocky			LHL 6 Cove		
Individual Sample ID:	Sp	ecies: YOY Jegill (Lepomis)	Photo Number(s):	_fish_101-150		
Abnormality Description	(s): NONE					
KU YOY	ENT: NORMAL P	15 H	505	NA LOCATION!		
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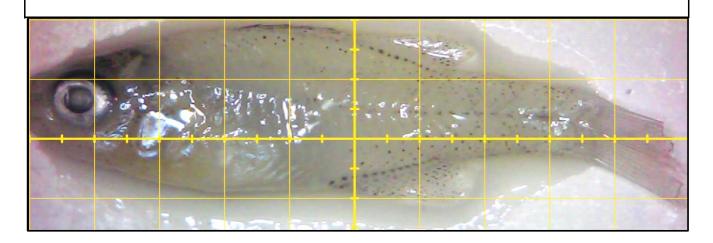


# Attachment I1-3 Completed Young-of-the-Year (YOY) Bluegill



	Notes:						
Primary Fish Health Assessor: RL			Six yellow grids = 1 cm				
28-30, 2018	1						
spine, fin(s)): 1	Tail						
ples From YO	Y Bass Sa	mpling Region (	circle one):				
let LHL1(R	ocky Arm)	LHL2(Dix Dam)	LHL3 Cove	LHL 6 Cove			
,	Species: Y		Photo				
	28-30, 2018 spine, fin(s)): <sup>-</sup> aples From YO	Six yello Six yello 28-30, 2018 spine, fin(s)): Tail sples From YOY Bass Sa	Six yellow grids = 1 cm 28-30, 2018 spine, fin(s)): Tail aples From YOY Bass Sampling Region (or	Six yellow grids = 1 cm 28-30, 2018 spine, fin(s)): Tail aples From YOY Bass Sampling Region (circle one):			

Tall Deformity





Assessment Date(s): Aug 28-30, 2018 Anatomical Category (e.g. spine, fin(s)): Tail

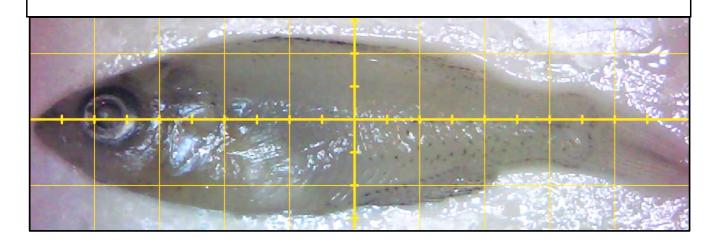
**Primary Fish Health Assessor: RL** 

**Recorder: AJS** 

**Third-Party Assessor:** 

	Examples From YOY Bass Sampling Region (circle one):									
<	Curds Inlet	HQ Inlet	LHL1(Ro	ocky Arm)	LHL2(Dix Dam)	LHL3 Cove	LHL 6 Cove			
Indiv	vidual Sample ID:			Species: \	/OY	Photo				
				Bluegill (Lepomis)		Number(s): UCI_002_L2,				
						UCI 002 D				

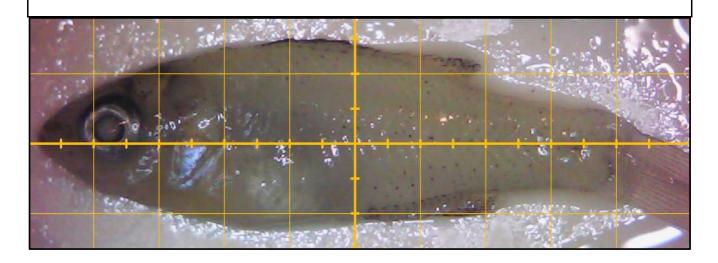
Abnormality Description(s): Tail Deformity

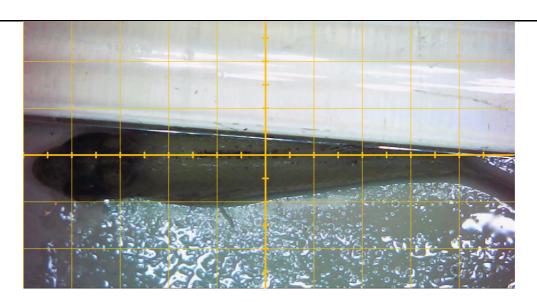


# Attachment I1-3 Completed Young-of-the-Year (YOY) Bluegill

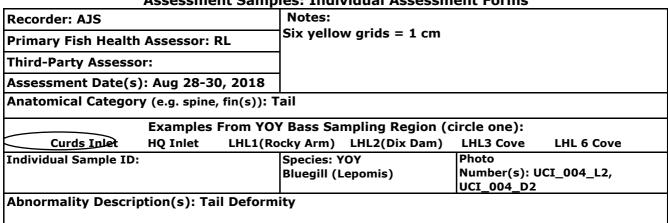


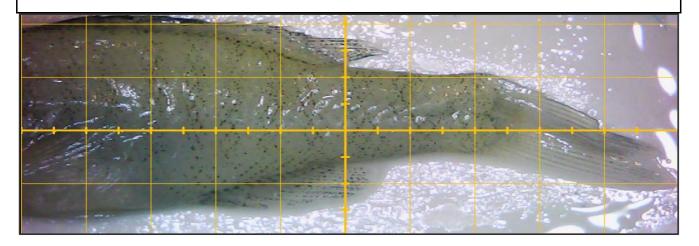
	Nataa		
Recorder: AJS	Notes:		
Primary Fish Health Assessor: RL	Six yellow grids = 1 cm		
Third-Party Assessor:			
Assessment Date(s): Aug 28-30, 2018	1		
Anatomical Category (e.g. spine, fin(s)): 1	Fail		
Examples From YO	Y Bass Sampling Region (	ircle one):	
Curds Inlet HQ Inlet LHL1(Re	ocky Arm) LHL2(Dix Dam)	LHL3 Cove LHL 6 Cove	
Individual Sample ID:	Species: YOYPhotoBluegill (Lepomis)Number(s):UCI_003UCI_003_D		

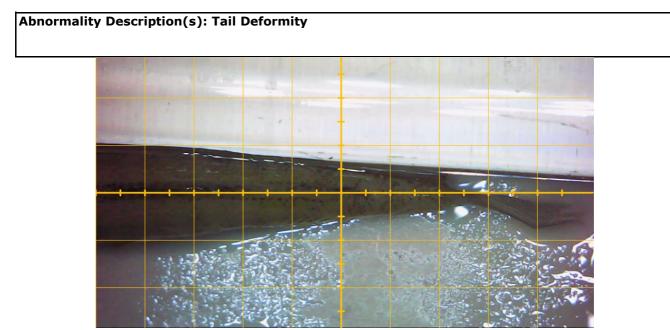




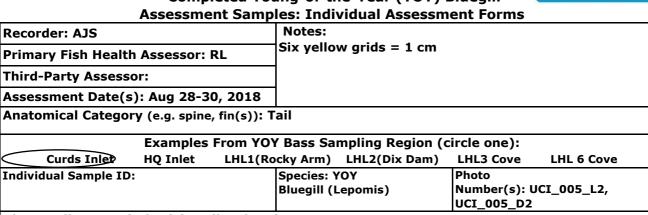
RAMBOLL





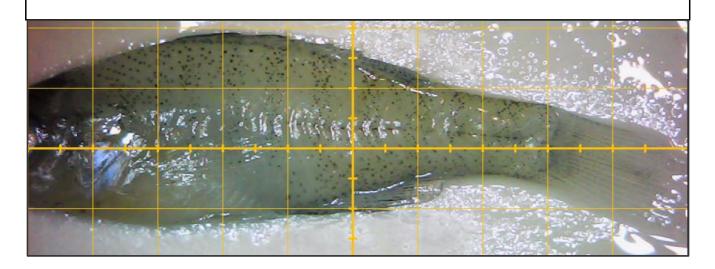


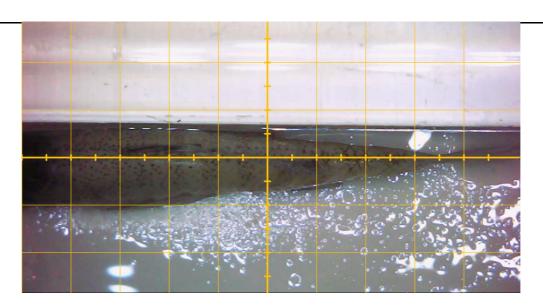
Page 8 of 9



RAMBOLL

Abnormality Description(s): Tail Deformity







Recorder: AJS	issessment Samp	Notes:	///////////////////////////////////////			
Primary Fish Health A	ssessor: RL	Six yellow grids	= 1 cm			
Third-Party Assessor:		- Fuermale of fich		6		
-		Example of fish deformities N=5		formities. I	otal without	
Assessment Date(s):			500			
Anatomical Category	(e.g. spine, fin(s)): r	vormai				
	Examples From YO	Y Bass Sampling	Region (ci	rcle one):		
	HQ Inlet LHL1(Ro			LHL3 Cove	LHL 6 Cove	
Individual Sample ID:		Species: YOY		Photo		
		Bluegill (Lepomis		Number(s): MCI_normal_	fish 1to50	
Abnormality Descript	ion(s): NONE					
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	BY: R. LOCKWOOD	SAMPLE IMAGE		the second	CI	4.
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### Attachment I1-3 Completed Young-of-the-Year (YOY) Bluegill Assessment Samples: Individual Assessment Forms

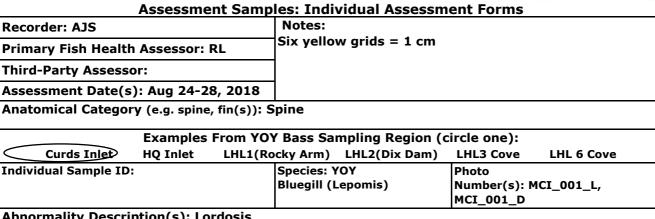


	Assessme	ent Sample	es: Individ	ual Assessm	ent Form	S	
Recorder: AJS			Notes:				
Primary Fish Health	Assessor:	RL	Six yellow g	rids = 1 cm			
Third-Party Assesso	or:		Example of t	fish with no d	leformities	. Total with	out
Assessment Date(s			deformities				, ac
Anatomical Categor		-	ormal				
					· · · ·		
Curds Inlet	Examples HQ Inlet	LHL1(Roc		ing Region ( L2(Dix Dam)	LHL3 Cove		
Individual Sample ID:		9	Species: YOY Bluegill (Lepo		Photo Number(s		
Abnormality Descri	ption(s): N(	ONE					
KU 909	ASSESSME	NT: NORMA	L FISH		405 SP	MPLING LOCA	TIONI
ASSESSED	By: R. LO	ckwood "	SAMPLE IM	AEE 2		MCI	
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6 36	37	18	39	40	41	42	
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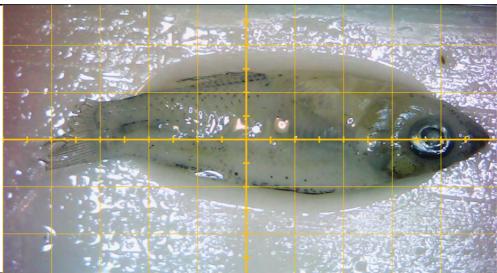
		•	eted You	-	Year (YOY)	Bluegill nent Forms	RAMB	ช์เเ
Record	ler: AJS			Notes:				
Primar	ry Fish Health	Assessor: R	۲L ۲	Six yellow g	rids = 1 cm			
Third-I	Party Assesso	or:		Example of f	fish with no	deformities.	Total withou	t
Assess	sment Date(s	): Aug 24-28	3, 2018 <b>(</b>	deformities	N=500			
Anator	mical Categor	y (e.g. spine,	fin(s)): No	ormal				
		Examples I	From YOY	Bass Sampl	ing Region (	circle one):		
	Curds Inlet	HQ Inlet	-		IL2(Dix Dam)	LHL3 Cove	LHL 6 Cove	e
[ndivid	ual Sample ID:			Species: YOY Bluegill (Lepo		Photo Number(s): MCL_norma	l_fish_101to1!	50
		D BY: R. LOO		AL FISH SAMPLE IN	NAGE 3		MCI	0N?
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	A state of the sta	1.3-0 16	46	46	47	46	49	
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# **Attachment I1-3** Completed Young-of-the-Year (YOY) Bluegill

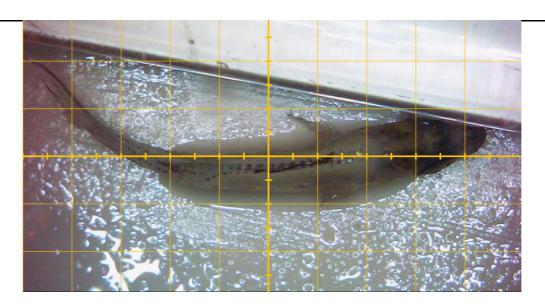
RAMBOLL



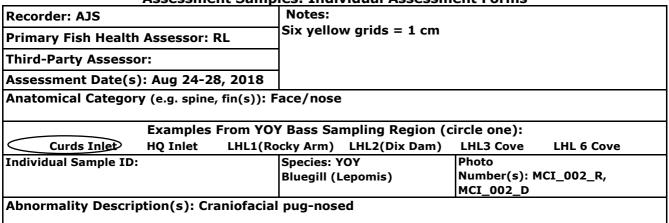
Abnormality Description(s): Lordosis

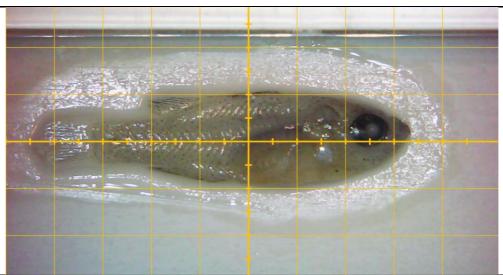


Abnormality Description(s): Lordosis

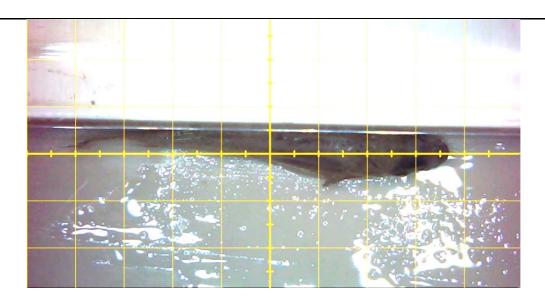


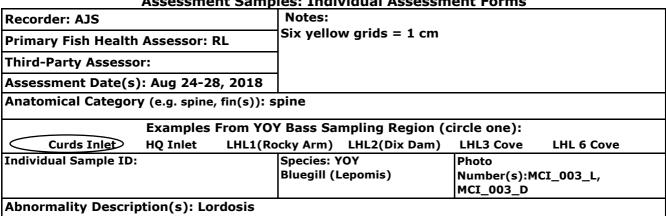
RAMBOLL

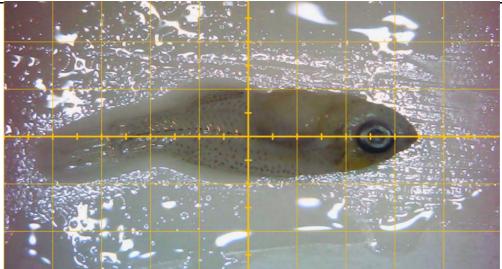




### Abnormality Description(s): Craniofacial pug-nosed

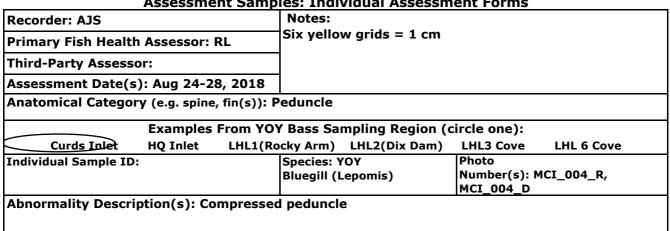


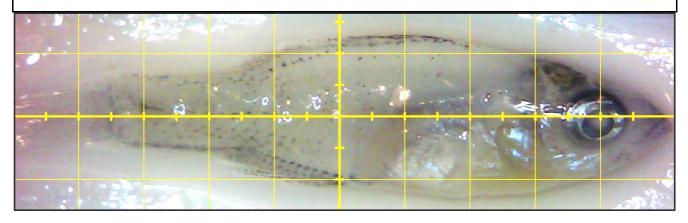




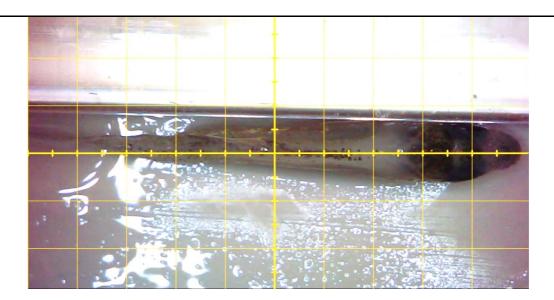
Abnormality Description(s): Scoliosis

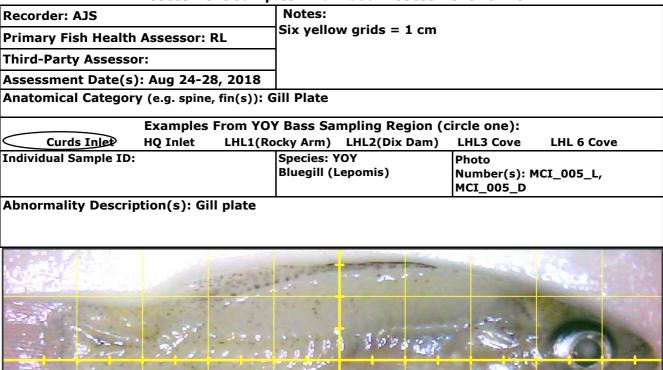
RAMBOLL

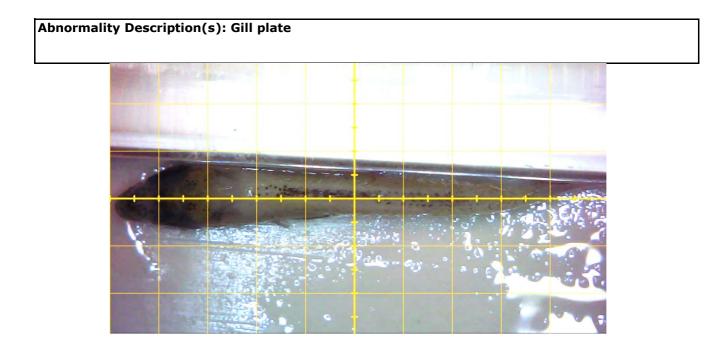


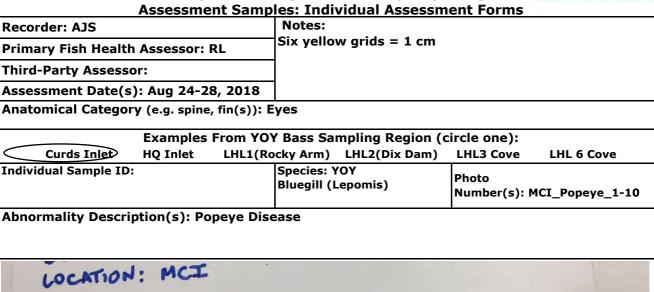


### Abnormality Description(s): Compressed peduncle

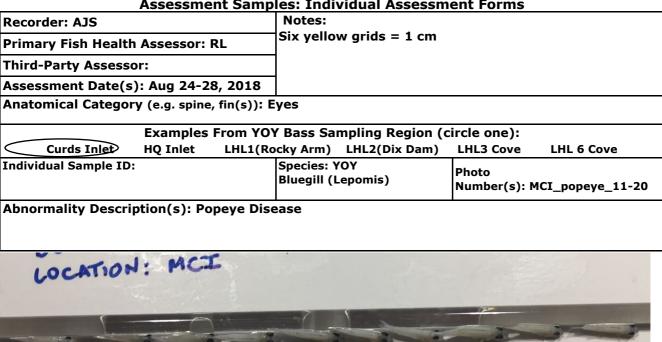


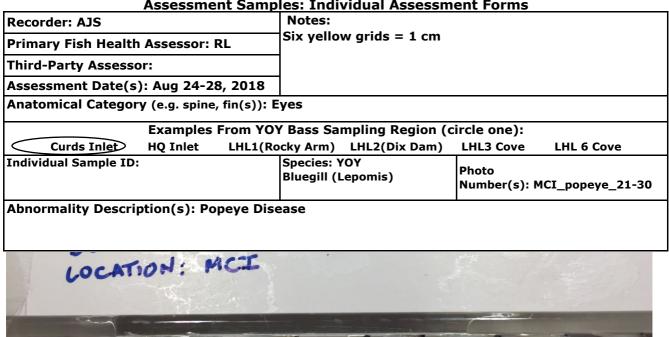


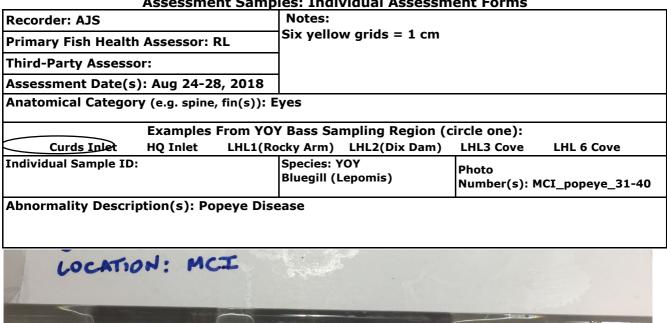


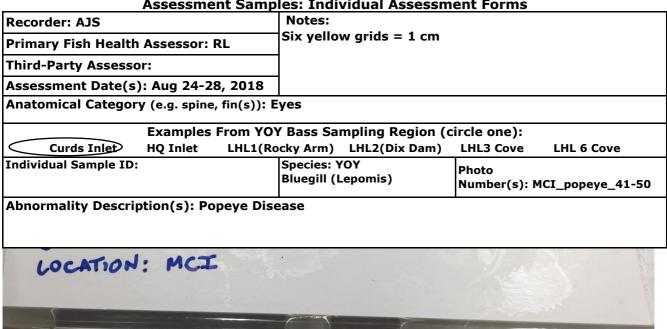


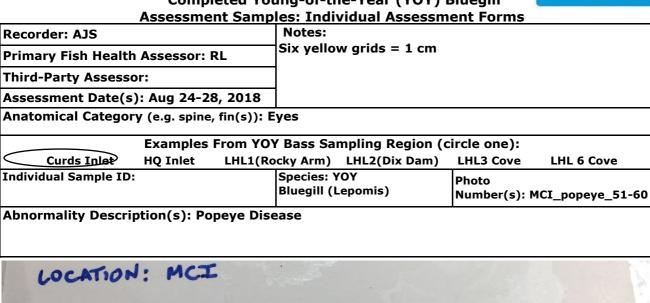
















Assessment Date(s): Aug 24-28, 2018 Anatomical Category (e.g. spine, fin(s)): Eyes Examples From YOY Bass Sampling Region (circle one): Curds Inlet HQ Inlet LHL1(Rocky Arm) LHL2(Dix Dam) LHL3 Cove LHL 6 Cove Individual Sample ID: Species: YOY Photo	
Anatomical Category (e.g. spine, fin(s)): Eyes           Examples From YOY Bass Sampling Region (circle one):           Curds Inlet         HQ Inlet         LHL1(Rocky Arm)         LHL2(Dix Dam)         LHL3 Cove         LHL 6 Cove           Individual Sample ID:         Species: YOY         Photo	
Curds Inlet         HQ Inlet         LHL1(Rocky Arm)         LHL2(Dix Dam)         LHL3 Cove         LHL 6 Cove           Individual Sample ID:         Species: YOY         Photo	
Examples From YOY Bass Sampling Region (circle one):           Curds Inlet         HQ Inlet         LHL1(Rocky Arm)         LHL2(Dix Dam)         LHL3 Cove         LHL 6 Cove           Individual Sample ID:         Species: YOY         Photo	
Curds Inlet         HQ Inlet         LHL1(Rocky Arm)         LHL2(Dix Dam)         LHL3 Cove         LHL 6 Cove           Individual Sample ID:         Species: YOY         Photo	
Individual Sample ID: Species: YOY Photo	
· Photo	/e
Bluegill (Lepomis) Number(s): MCI_popeye_(	_61-70
Abnormality Description(s): Popeye Disease	

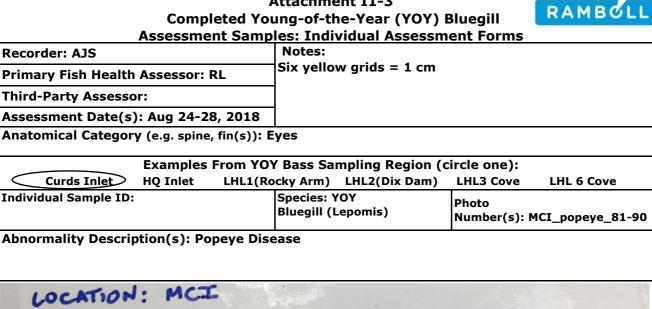




Primary Fish Health Assessor	: RL Six yell	ow grids = 1 cm		
hird-Party Assessor:				
Assessment Date(s): Aug 24-	28, 2018			
Anatomical Category (e.g. spir	e, fin(s)): Eyes			
Example	s From YOY Bass S	ampling Region (	circle one):	
Curds Inlet HQ Inlet	LHL1(Rocky Arm	) LHL2(Dix Dam)	LHL3 Cove	LHL 6 Cove
ndividual Sample ID:	Species Bluegill	: YOY (Lepomis)	Photo Number(s): I	MCI_popeye_71-80
Abnormality Description(s): F	opeye Disease			



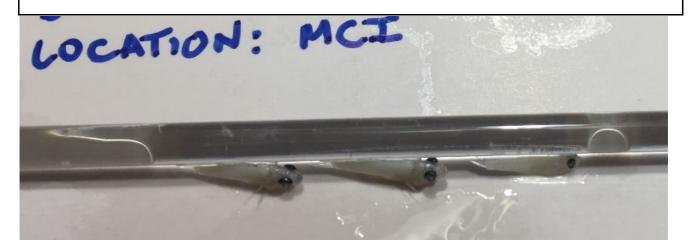
# **Attachment I1-3** Completed Young-of-the-Year (YOY) Bluegill

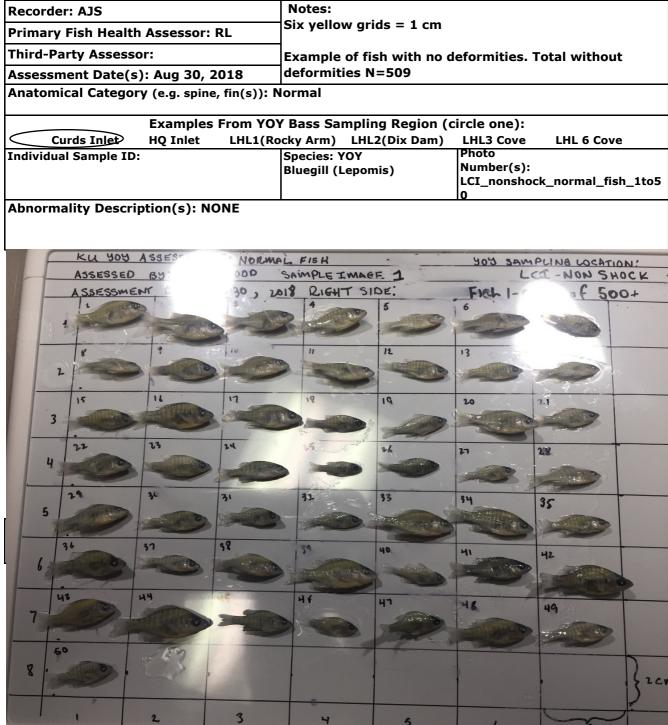


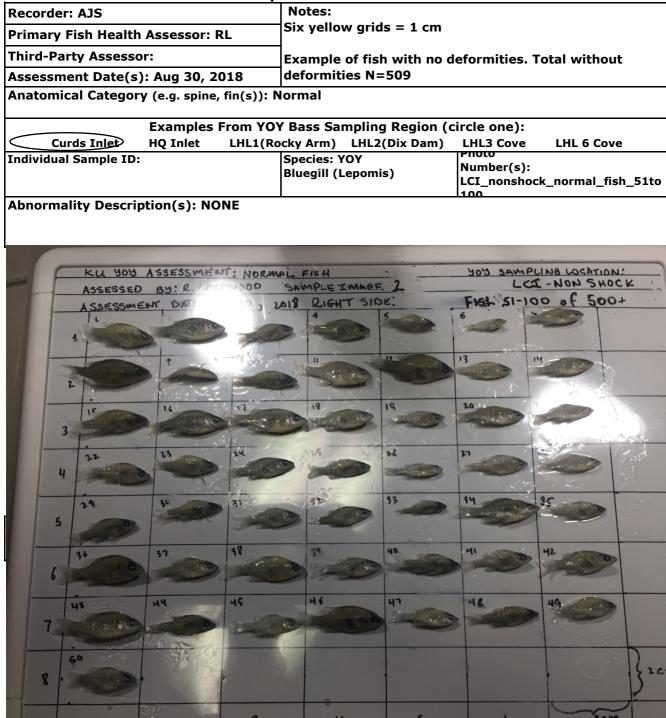


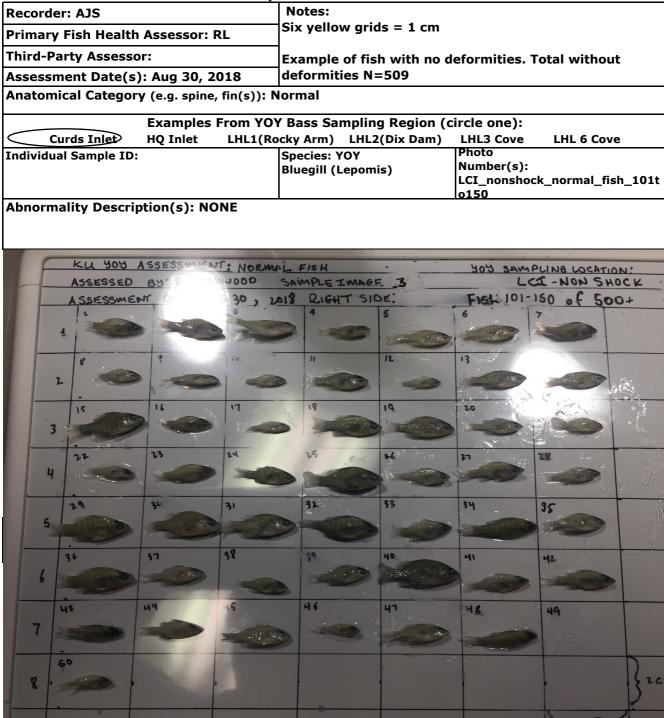


Bluegill (Lenomis)	Recorder: AJS			Notes:			
Assessment Date(s): Aug 24-28, 2018 Anatomical Category (e.g. spine, fin(s)): Eyes Examples From YOY Bass Sampling Region (circle one): HQ Inlet LHL1(Rocky Arm) LHL2(Dix Dam) LHL3 Cove LHL 6 Cove Individual Sample ID: Species: YOY Bluegill (Lenomic) Photo	Primary Fish Health A	ssessor:	RL	Six yellov	w grids = 1 cm		
Anatomical Category (e.g. spine, fin(s)): Eyes           Examples From YOY Bass Sampling Region (circle one):           Curds Inlet         HQ Inlet         LHL1(Rocky Arm)         LHL2(Dix Dam)         LHL3 Cove         LHL 6 Cove           Individual Sample ID:         Species: YOY         Photo	Third-Party Assessor:						
Examples From YOY Bass Sampling Region (circle one):         Curds Inlet       HQ Inlet       LHL1(Rocky Arm)       LHL2(Dix Dam)       LHL3 Cove       LHL 6 Cove         Individual Sample ID:       Species: YOY       Photo	Assessment Date(s):	Aug 24-2	8, 2018				
Curds Inlet     HQ Inlet     LHL1(Rocky Arm)     LHL2(Dix Dam)     LHL3 Cove     LHL 6 Cove       Individual Sample ID:     Species: YOY     Photo	Anatomical Category	(e.g. spine	, fin(s)): E	yes			
Individual Sample ID: Species: YOY Photo		Examples	From YO	Y Bass Sai	mpling Region (c	circle one):	
Bluegill (Lenomis)	Curds Inlet	HQ Inlet	LHL1(Ro	ocky Arm)	LHL2(Dix Dam)	LHL3 Cove	LHL 6 Cove
Rumber(s). Mct_popeye_s1-s5	Individual Sample ID:			•			ICI_popeye_91-93

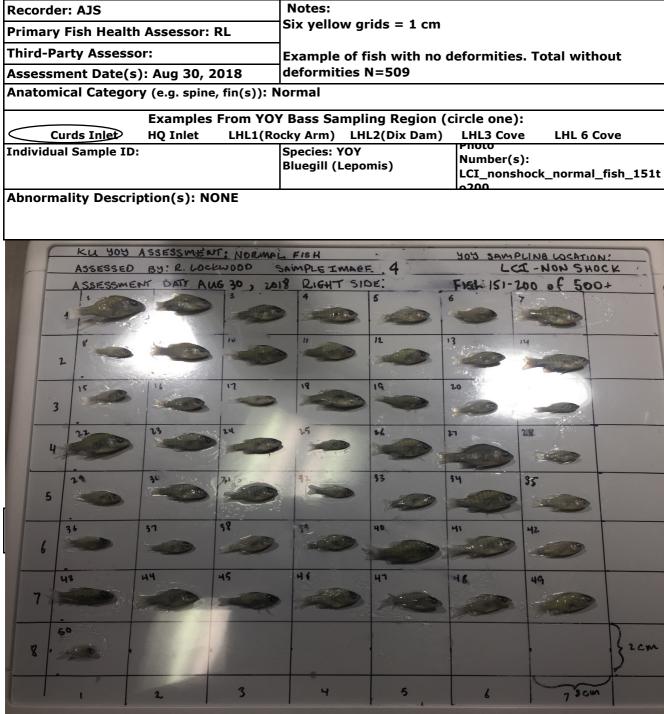








RAMBOLL





Assessment Samples: Individual Assessment Forms				
Recorder: AJS	Notes:			
Primary Fish Health Assessor: RL	Six yellow grids = 1 cm collection method: Electrofishing			
Third-Party Assessor:				
Assessment Date(s): Aug 30, 2018	Example of fish with no deformities. Total without deformities N=509			

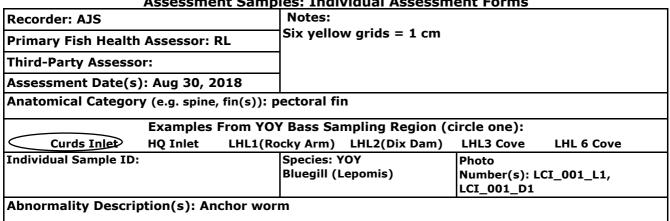
Anatomical Category (e.g. spine, fin(s)): Normal

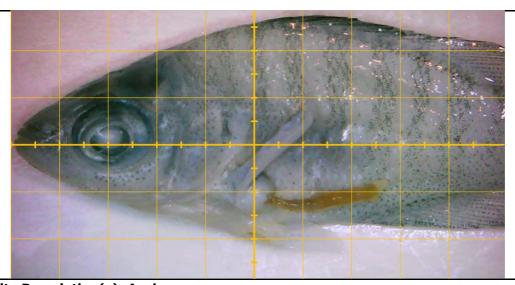
Examples From YOY Bass Sampling Region (circle one):							
Curds Inlet HQ	Inlet LHL1(Ro	cky Arm)	LHL2(Dix Dam)	LHL3 Cove	LHL 6 Cove		
Individual Sample ID:		Species: YO Bluegill (Le	pomis)	Photo Number(s): LCI_shock_no	rmal_fish_1to43		

#### Abnormality Description(s): NONE

ASSESSED BY: R. L	ENT: NORMAL	FISH	- 1 - F1	903 SAMI	A -SHOCK	ON?
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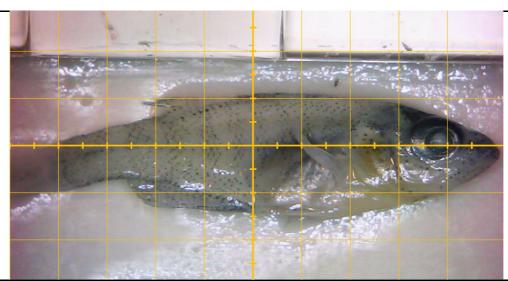


Abnormality Description(s): Anchor worm

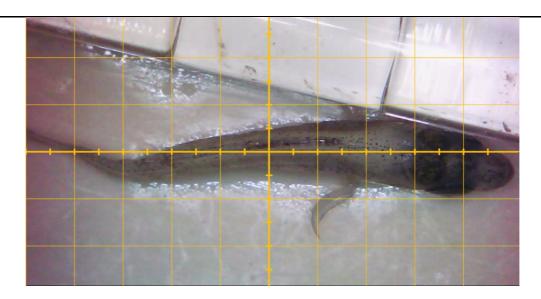


Recorder: AJS		•	Notes:			
Primary Fish Health	Assessor:	RL	Six yellow grids = 1 cm			
Third-Party Assesso	or:		1			
Assessment Date(s)	): Aug 30, 2	018				
Anatomical Categor	y (e.g. spine	, fin(s)):	•			
	Examples	From YO	/ Bass Sa	mpling Region (d	circle one):	
Curds Inlet	HQ Inlet	LHL1(Ro	cky Arm)	LHL2(Dix Dam)	LHL3 Cove	LHL 6 Cove
Individual Sample ID:			Species: \	′0Y	Photo	
			Bluegill (I	.epomis)	Number(s): L	CI_002_R,
					LCI_002_D	

### Abnormality Description(s):



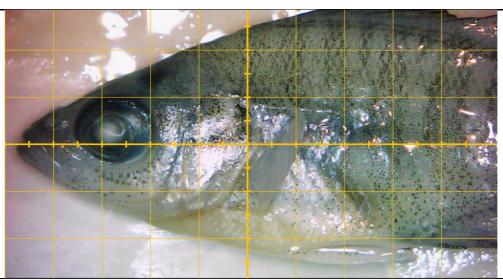
## Abnormality Description(s):



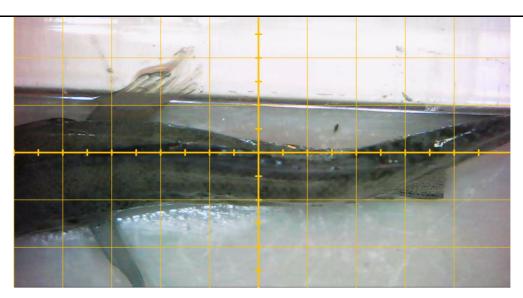


	Assessme	ent Samp	ies: Indi	vidual Assessm	ient Forms	
Recorder: AJS			Notes:			
Primary Fish Health	Assessor:	RL	Six yellow grids = 1 cm			
Third-Party Assesso	or:		1			
Assessment Date(s)	): Aug 30, 2	2018				
Anatomical Categor	y (e.g. spine	, fin(s)):	-			
	Examples	From YO	Y Bass Sa	mpling Region (	circle one):	
Curds Inlet	HQ Inlet	LHL1(Ro	ocky Arm)	LHL2(Dix Dam)	LHL3 Cove	LHL 6 Cove
Individual Sample ID:			Species: \	/OY	Photo	
			Bluegill (I	_epomis)	Number(s): L LCI_003_D2	CI_003_L1,

## Abnormality Description(s):



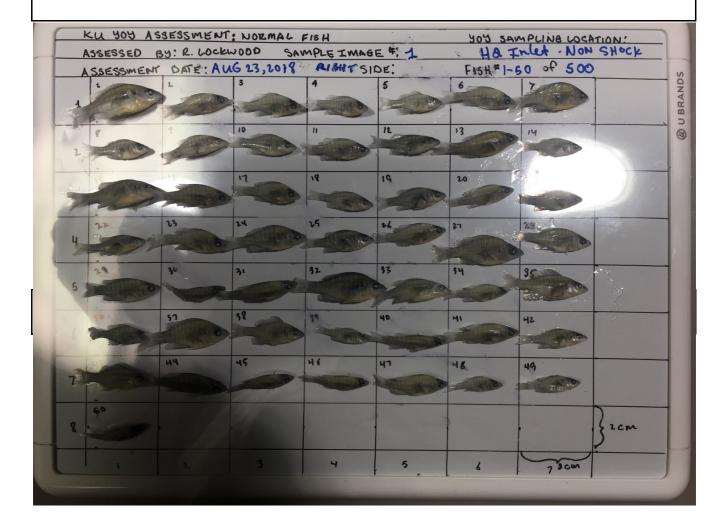
## Abnormality Description(s):





Assessment Sam	oles: Individual Assessm	ent Forms		
Recorder: AJS	Notes:			
Primary Fish Health Assessor: RL	Six yellow grids = 1 cm			
Third-Party Assessor:	Example of fish with no deformities. Total without			
Assessment Date(s): Aug 22-23, 2018	deformities N=499			
Anatomical Category (e.g. spine, fin(s)):	Normal			
Examples From YO	Y Bass Sampling Region (c	ircle one):		
Curds Infet HQ Inlet LHL1(R	ocky Arm) LHL2(Dix Dam)	LHL3 Cove LHL 6 Cove		
Individual Sample ID:	Species: YOY Bluegill (Lepomis)	Photo Number(s): HQ_Inlet_Normal_Fish_1to50		

Abnormality Description(s): NONE



Completed N Assessment Sar	Attachmen Young-of-the mples: Indivi	-Year (YOY	-	RAME	<b>B</b> CLL
Recorder: AJS	Notes:	<u>uuai A33533</u>		13	
Primary Fish Health Assessor: RL	Six yellow	grids = 1 cn	ı		
Third-Party Assessor:	Example o	f fish with no	o deformitie	s. Total witho	ut
Assessment Date(s): Aug 22-23, 2018	-				at
Anatomical Category (e.g. spine, fin(s))					
Examples From 1					
	(Rocky Arm) L	-	) LHL3 Cov	ve LHL 6 Co	ve
Individual Sample ID:	Species: YO Bluegill (Lej		Photo Number(s HQ_Inlet	s): _Normal_Fish_	51to100
Abnormality Description(s): NONE					
KU YOY ASSESSMENT: NOR	LMAL FISH	t.g	903 3	AMPLING LOCA	
ASSESSED BY : R. LOCKWOOD	SAMPLEIN				SHOCK
ASSESSMENT DATE: AUG 23	,2019 RIGHT	SIDE:	FISH *	51-100 of 500	1
8 9 10	11	12	13	14	
					1. <sup>2</sup>
15 18 12	18	19	20	21	
24	25	26	27		
4	0				
29 30 31	32	33	34	35	
5					
36 37 38	39	40	41	42	
6	A CONTRACT				
43 44 45	46	47	48	49	
1200					0
8 50	A Company				320
1 2 3	ч	5	6	7300	~



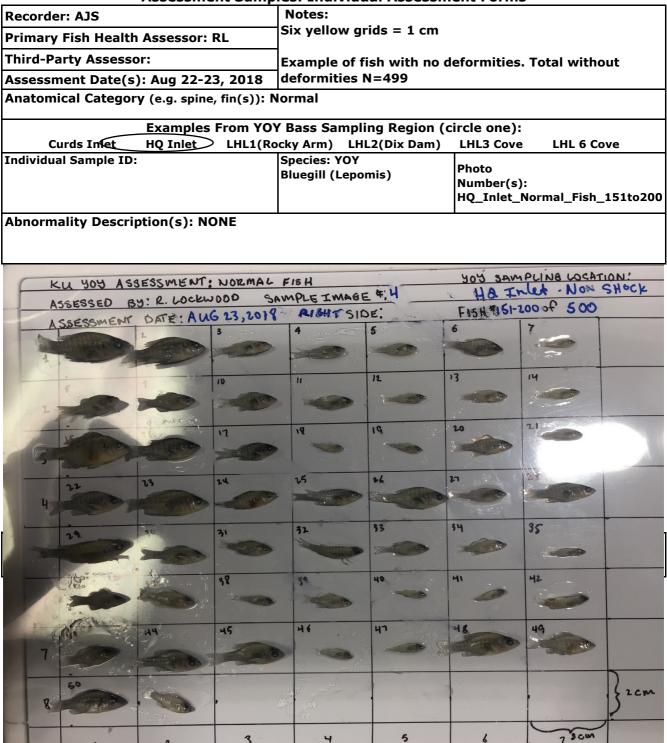
Assessment Jan	Des: Individual Assessment Forms	
Recorder: AJS	Notes:	
Primary Fish Health Assessor: RL	Six yellow grids = 1 cm	
Third-Party Assessor:	Example of fish with no deformities. Total without	
Assessment Date(s): Aug 22-23, 2018	deformities N=499	
Anatomical Category (e.g. spine, fin(s)):	Normal	
	Y Bass Sampling Region (circle one):	

Curds Inlet	HQ Inlet	LHL1(Rocky Arm)	LHL2(Dix Dam)	LHL3 Cove	LHL 6 Cove
Individual Sample ID:		Species: Y Bluegill (L		Photo Number(s): HQ_Inlet_No	ormal_Fish_101to150

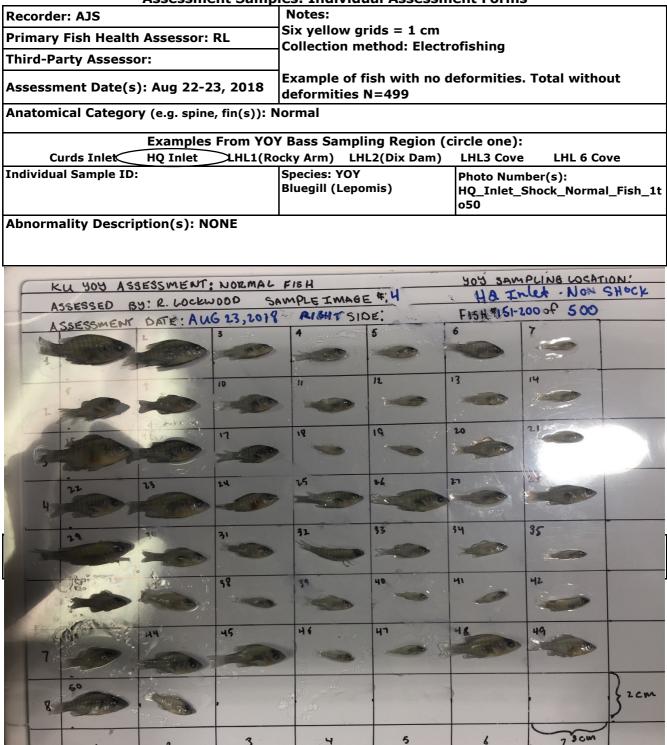
Abnormality Description(s): NONE

F		BY: R. LOCK			E 4:3	YOU SAN	Net - Non S	ON:
		IT DATE AU				FISH TOI.	150 of 500	
	1	-	3	4	5	6	7	
	8	?	10	11	12	13	14	
3	15	16 clash	17	19	19	20	21	J.
4	1200	13	24	25	26	27		
5	29	30	31	32	33	34	35	
6	1	37	38	39	40	41	42	Jul .
7		нч	45	41	Ч	48	49	36
8 :	5° 3.000							} 2 cm
L	t	2	3	ч	5	6	7300	

RAMBOLL

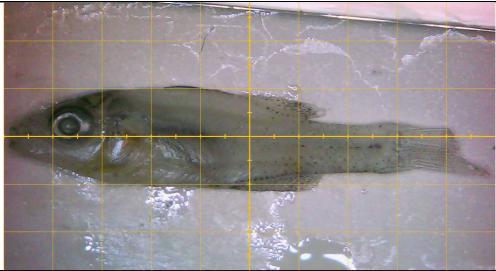


RAMBOLL

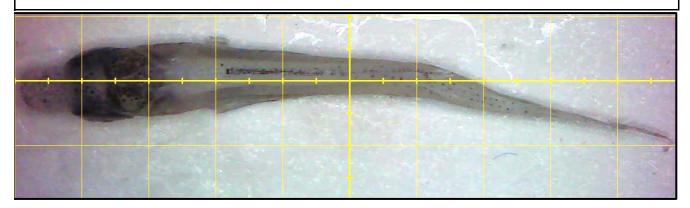




Recorder: AJS	Notes:	Notes:			
Primary Fish Health Assessor: RL	Six yellow grids = 1 cr	n			
Third-Party Assessor:	Collection method: Sei	ne net/ minnow trap			
Assessment Date(s): Aug 22-23, 20	)18				
Anatomical Category (e.g. spine, fin(s)): Spine					
Examples From YOY Bass Sampling Region (circle one): Curds Infet HO Inlet LHL1(Rocky Arm) LHL2(Dix Dam) LHL3 Cove LHL 6 Cove					
Curds Infet HQ Inlet LH	LI(ROCKY AIIII) LHL2(DIX Dali	n) LHL3 Cove LHL 6 Cove			
Individual Sample ID:	Species: YOY Bluegill (Lepomis)	Photo Number(s): HQ_nonshock_001L, HQ_nonshock_001D			



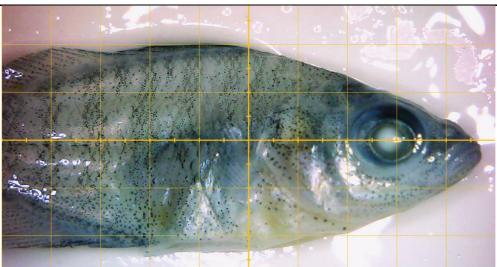
Abnormality Description(s): Scoliosis

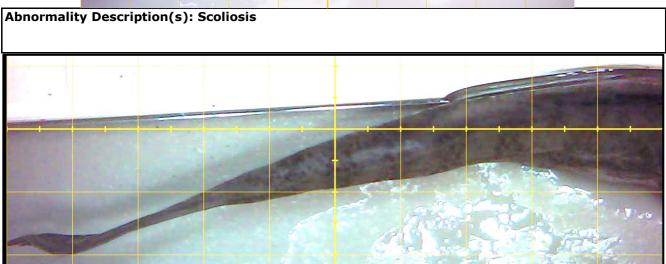




Assessment Samp	oles: Individual Assessm	ent Forms		
Recorder: AJS	Notes:			
Primary Fish Health Assessor: RL	Six yellow grids = 1 cm			
Third-Party Assessor:	Collection method: Seine	net/ minnow trap		
Assessment Date(s): Aug 22-23, 2018				
Anatomical Category (e.g. spine, fin(s)): S	Spine			
Examples From YO	Y Bass Sampling Region (c	ircle one):		
Curds Infet HQ Inlet LHL1(R	ocky Arm) LHL2(Dix Dam)	LHL3 Cove LHL 6 Cove		
Individual Sample ID:	Species: YOY	Photo		

Abnormality Description(s): Scoliosis







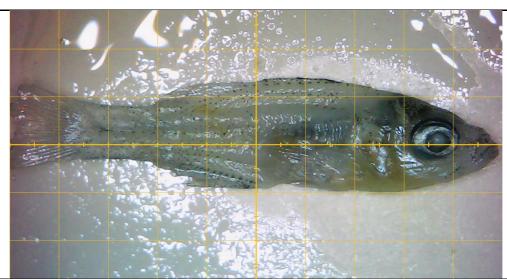
Number(s): HQ\_003R, HQ\_003D

Photo

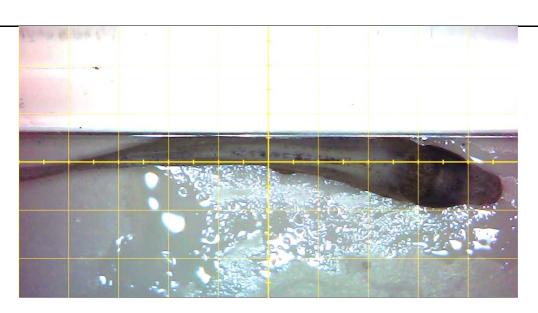
Assessmen	nt Samples: Individual Assess	sment Forms
Recorder: AJS	Notes:	
Primary Fish Health Assessor: R	Six yellow grids = 1 cm	1
Third-Party Assessor:	Collection method: Sei	ne net/ minnow trap
Assessment Date(s): Aug 22-23	, 2018	
Anatomical Category (e.g. spine,	fin(s)): Face/mouth	
Examples F	rom YOY Bass Sampling Region	(circle one):
Curds Inlet HQ Inlet	LHL1(Rocky Arm) LHL2(Dix Dam	) LHL3 Cove LHL 6 Cove
Individual Sample ID:	Species: YOY	Rhata

Bluegill (Lepomis)

Abnormality Description(s): Facial deformity



Abnormality Description(s): Facial deformity





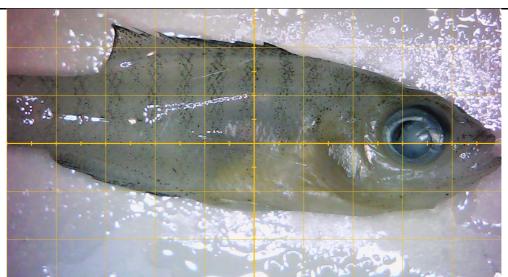
Number(s): HQ\_004R1,

HQ\_004D1

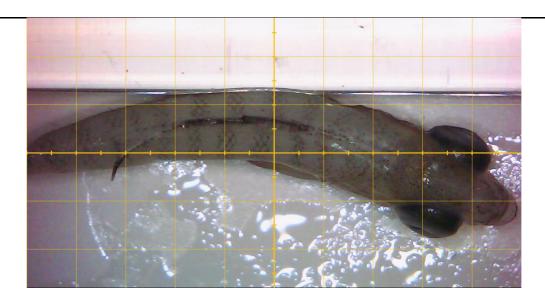
Assessment Sa	amples: Individual Assessment Forms
Recorder: AJS	Notes:
Primary Fish Health Assessor: RL	Six yellow grids = 1 cm
Third-Party Assessor:	Collection method: Seine net/ minnow trap
Assessment Date(s): Aug 22-23, 20	18
Anatomical Category (e.g. spine, fin(s	)): Eyes
Examples From	YOY Bass Sampling Region (circle one):
Curds Inlet HQ Inlet LHL	.1(Rocky Arm) LHL2(Dix Dam) LHL3 Cove LHL 6 Cove
Individual Sample ID:	Species: YOY Photo

Bluegill (Lepomis)

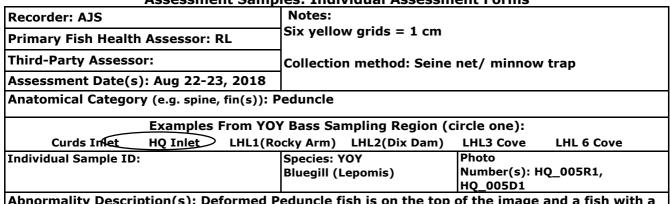
Abnormality Description(s): Exophthalmia (popeye)



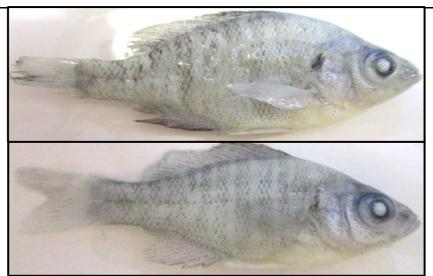
Abnormality Description(s): Exophthalmia (popeye)



RAMBOLL



Abnormality Description(s): Deformed Peduncle fish is on the top of the image and a fish with a normal peduncle is on the bottom.



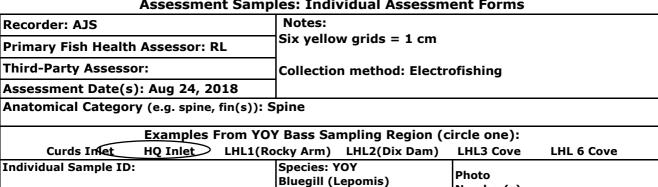
Abnormality Description(s): Deformed Peduncle fish is on the top of the image and a fish with a normal peduncle is on the bottom.



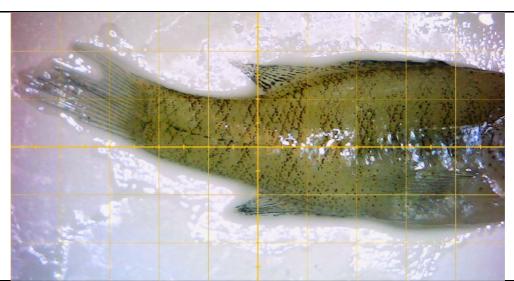
RAMBOLL

Number(s):

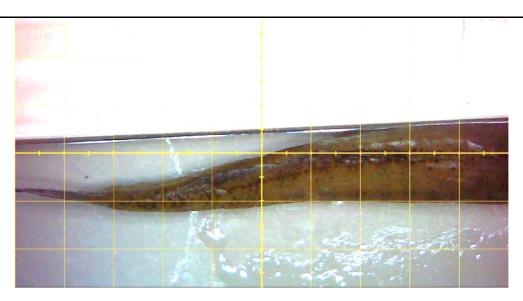
HQ\_Inlet\_Shock\_Fish1 (4,6)



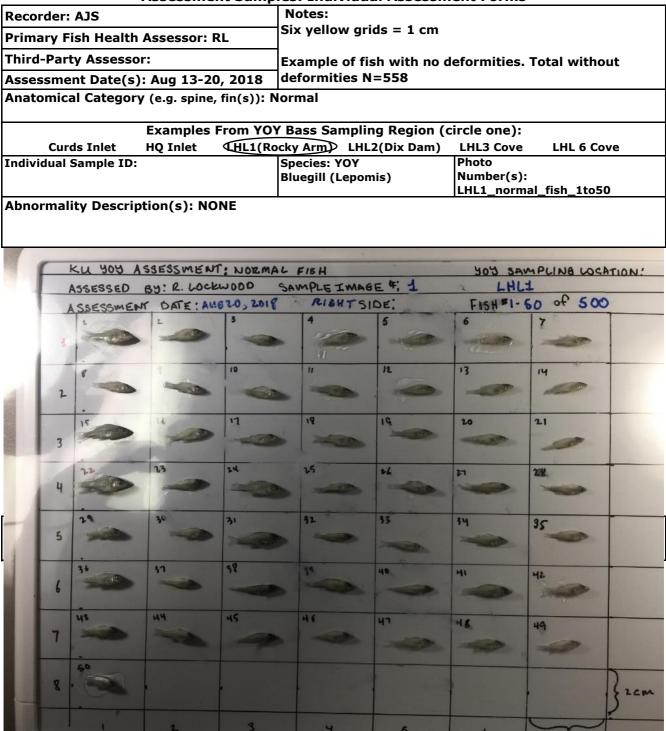
Abnormality Description(s): Lordosis



Abnormality Description(s):Lordosis

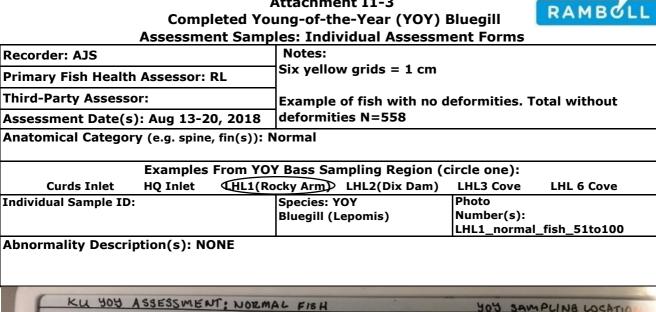


RAMBOLL



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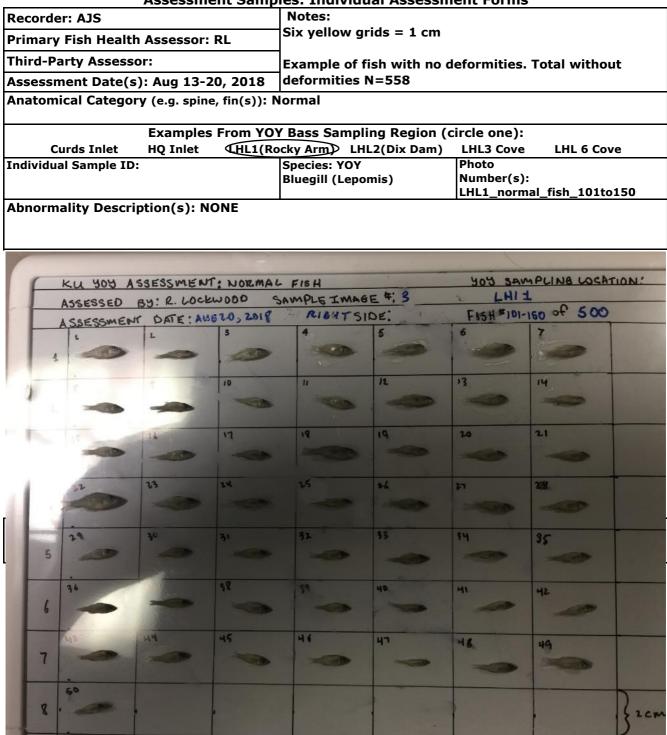
# **Attachment I1-3** Completed Young-of-the-Year (YOY) Bluegill



	-	KU 909 A	SSESSMENT	: NORMAL	FISH		405 SA	MPLINE LOC	ATIO
		ASSESSED	BY: R. LOCK	WOOD SA	MPLE IMAG	E # 2	· LHI		
	1	ASSESSMENT	DATE : AM	820,2018 ·	RIGHTSI	DE:	FISH#51	-1000f 500	)
		1	L	3	4	5	6	7	1000
	1	-			-		-	0	
		8	5 A	10	11	12	13	14	
	2	-				-		-	
-	1		16	17/	19	19	20	21	
						-			
		22	23	24	25	26	27	22	
	1	-			0			-	
L.	100	29	30	31	32	93	54	35	
	5		-	æ	-	-			
		36	37	38	39	40	-	42	
	6			9	-				
	-	45	44	45	46	47	46	49	
	٦			-		-	-	-	
-	8	50							} 2cm
		t.	2	3	ч	5	,	-	-

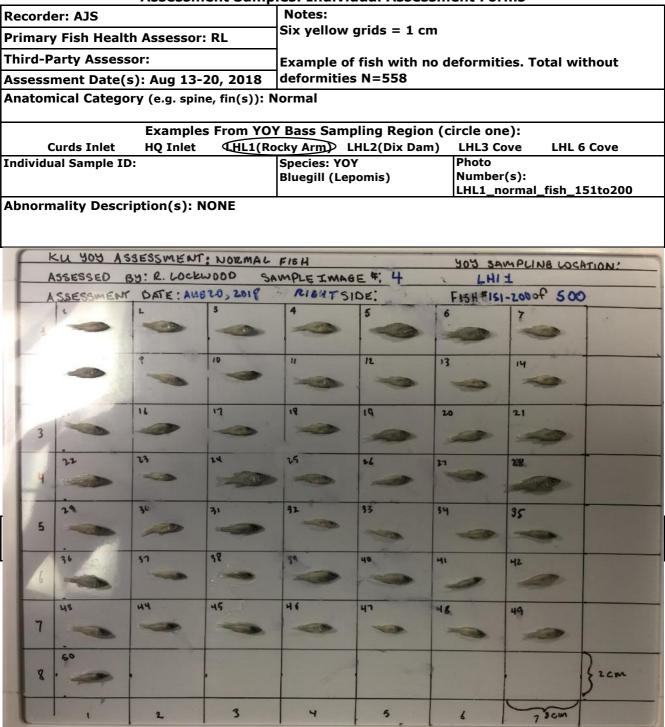
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RAMBOLL



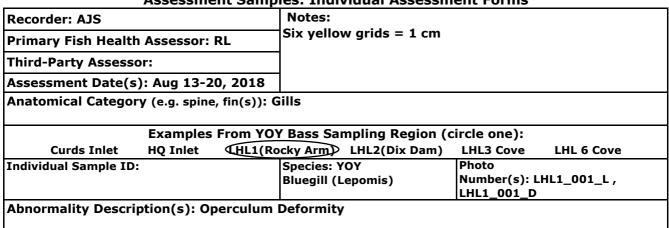
Page 3 of 16

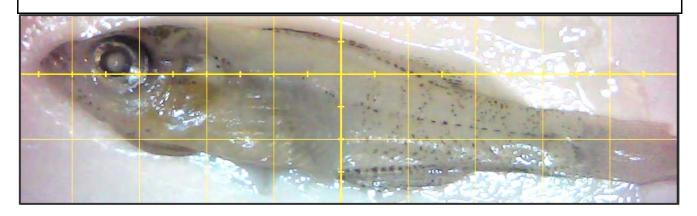
RAMBOLL



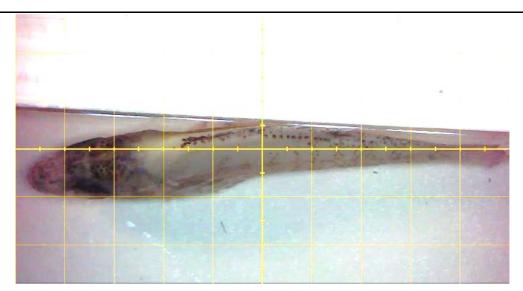
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RAMBOLL





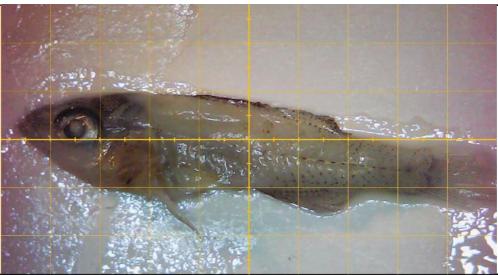
#### Abnormality Description(s): Operculum Deformity



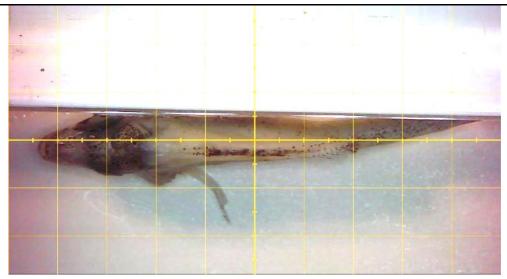




Recorder: AJS Primary Fish Health Assessor: RL		Notes: Six yellow grids = 1 cm		
Assessment Date(s): Aug 13-	20, 2018	1		
Anatomical Category (e.g. spin	e, fin(s)): S	Stomach and Gills		
Example	s From YO	<u>Y Ba</u> ss Sampling Region (c	circle one):	
Curds Inlet HQ Inlet	<b>⊄HL1(R</b> ¢	ocky Arm LHL2(Dix Dam)	LHL3 Cove	LHL 6 Cove
Individual Sample ID:		Species: YOY Bluegill (Lepomis)	Photo Number(s): L LHL1_002_D	HL1_002_L,
Abnormality Description(s): S	tomach pr	otruding through gill chan	bers	

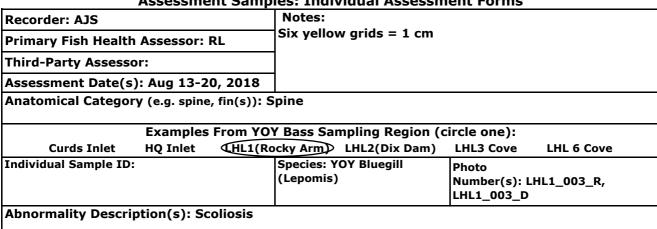


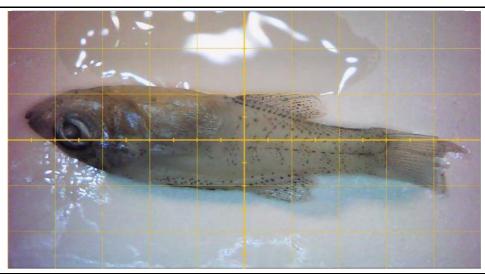
Abnormality Description(s): Stomach protruding through gill chambers



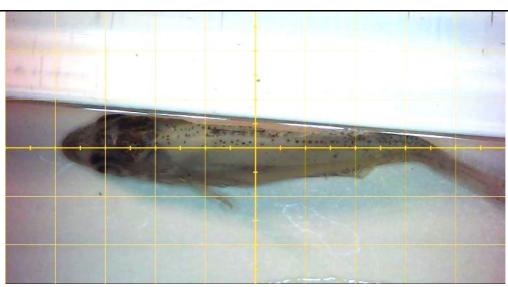
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RAMBOLL



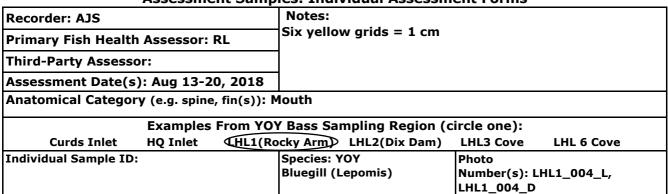


#### Abnormality Description(s): Scoliosis

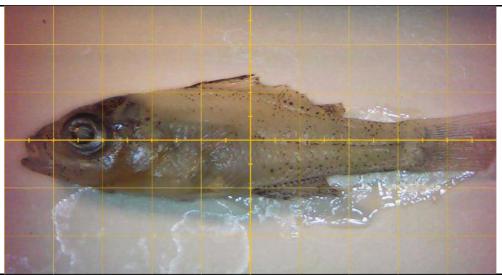


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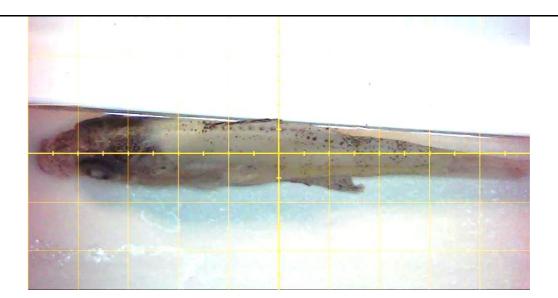
RAMBOLL



Abnormality Description(s): Mouth deformity

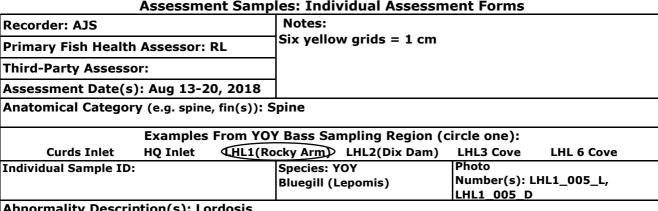


Abnormality Description(s): Mouth deformity

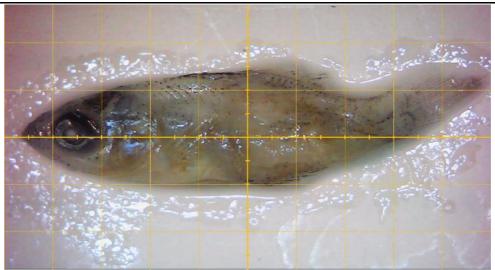


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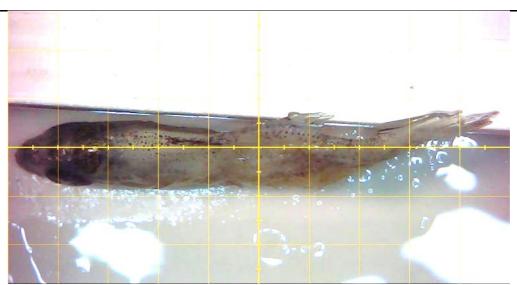
RAMBOLL



Abnormality Description(s): Lordosis

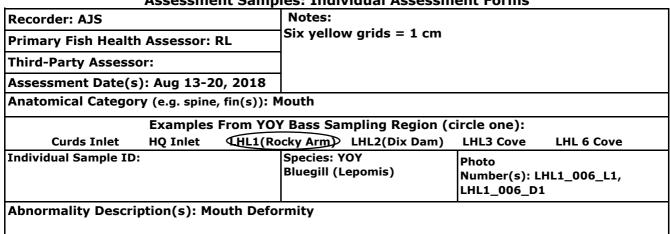


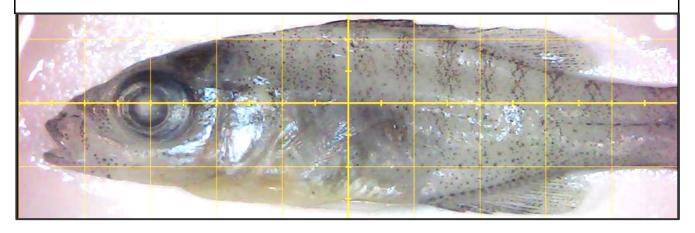
### Abnormality Description(s): Lordosis



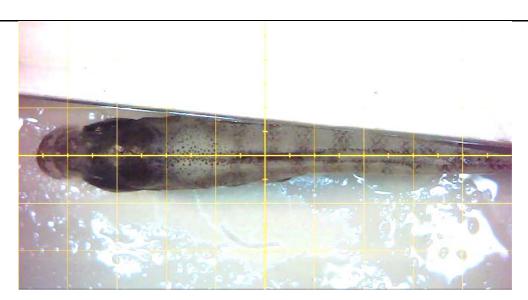
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RAMBOLL



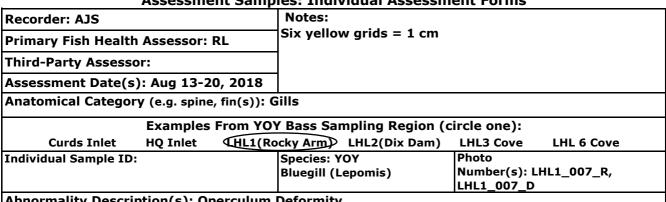


## Abnormality Description(s): Mouth Deformity

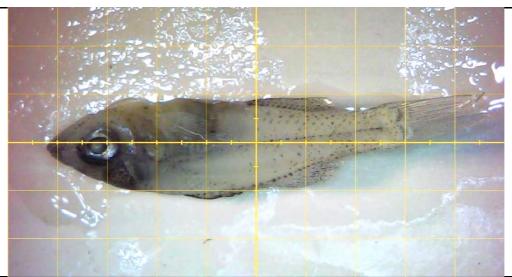


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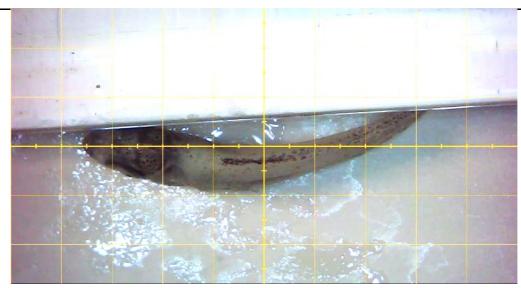
RAMBOLL



Abnormality Description(s): Operculum Deformity



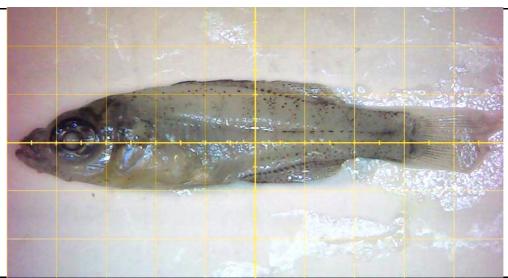
Abnormality Description(s): Operculum Deformity







///////////////////////////////////////	t Samples: Individual Assess			
Recorder: AJS	Notes:	Notes: Six yellow grids = 1 cm		
Primary Fish Health Assessor: R	Six yellow grids = 1 cm			
Third-Party Assessor:				
Assessment Date(s): Aug 13-20,	, 2018			
Anatomical Category (e.g. spine,	fin(s)): Mouth and face			
Examples F	rom YOY Bass Sampling Region (	circle one):		
Curds Inlet HQ Inlet	HL1(Rocky Arm) LHL2(Dix Dam)	LHL3 Cove LHL 6 Cove		
Individual Sample ID:	Species: YOY Bluegill (Lepomis)	Photo Number(s): LHL1_008_L, LHL1_008_D		
Abnormality Description(s): Mou	th/Facial deformities	· • •		

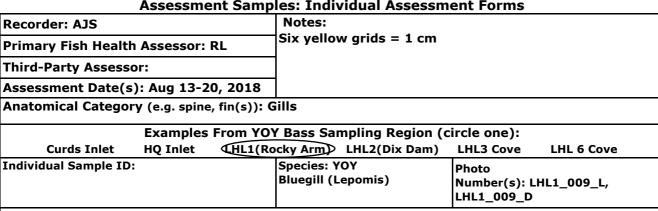


Abnormality Description(s): Mouth/Facial deformities

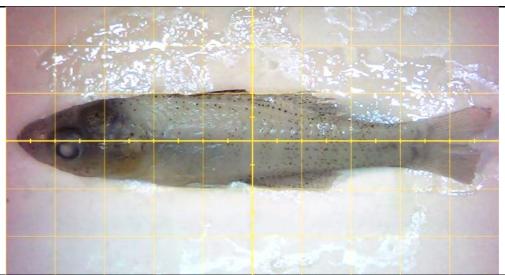


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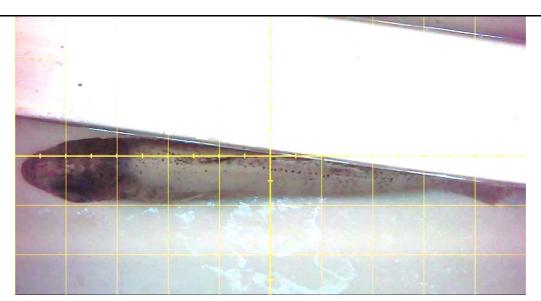
RAMBOLL



Abnormality Description(s): Operculum Deformity

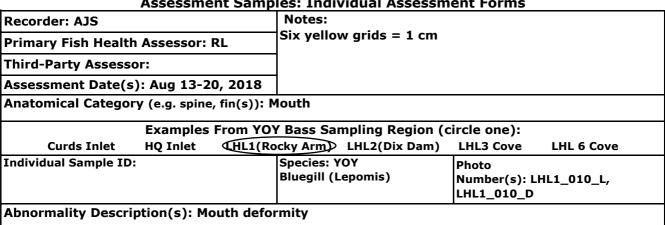


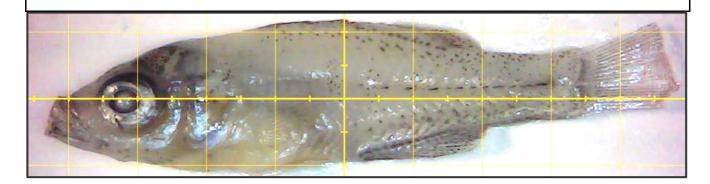
Abnormality Description(s): Operculum Deformity

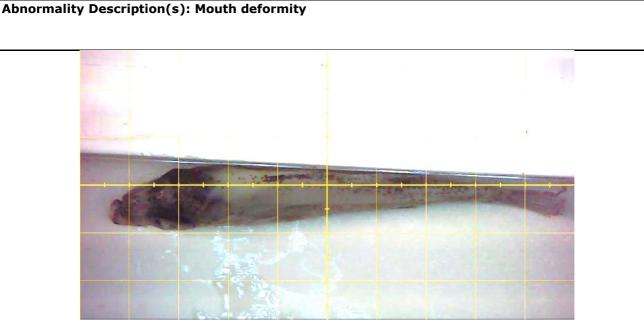


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RAMBOLL

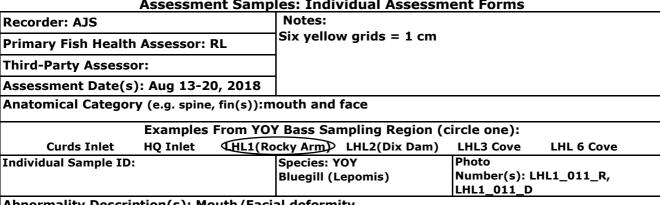




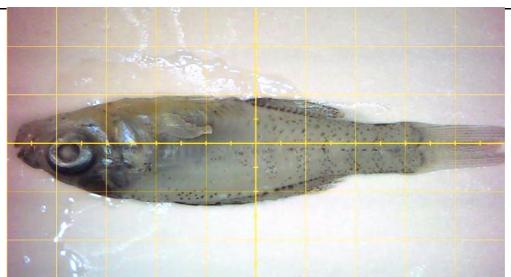




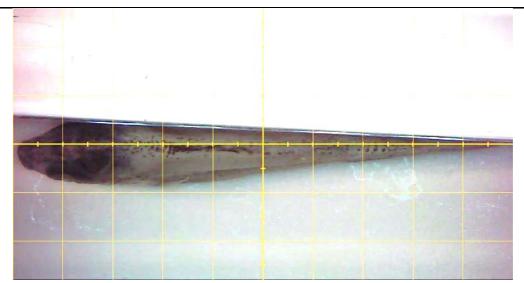
RAMBOLL



Abnormality Description(s): Mouth/Facial deformity

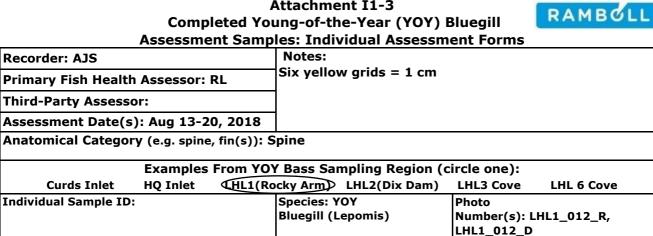


Abnormality Description(s): Mouth/Facial deformity

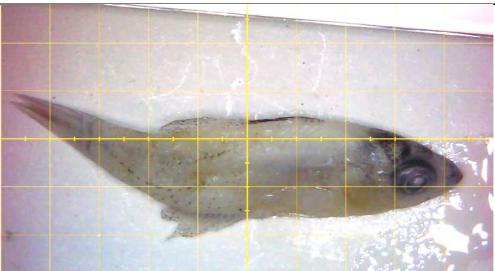


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# **Attachment I1-3** Completed Young-of-the-Year (YOY) Bluegill



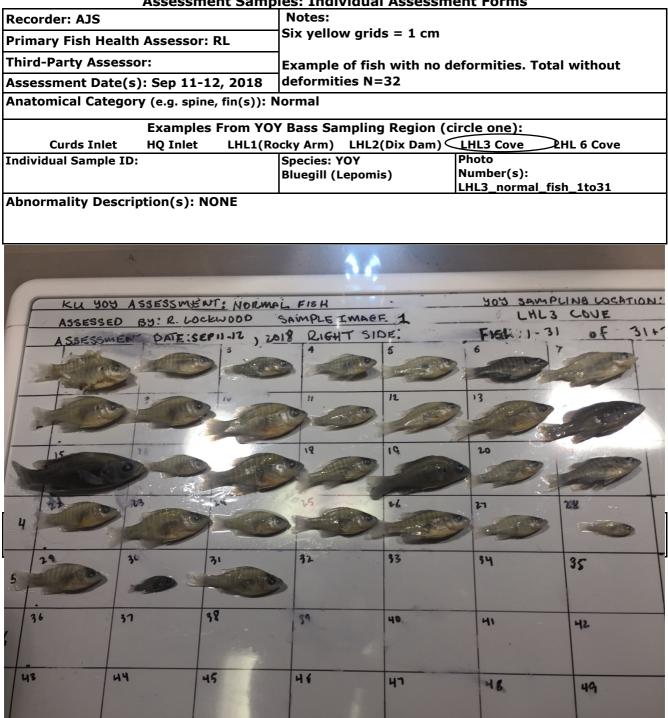
Abnormality Description(s): Scoliosis





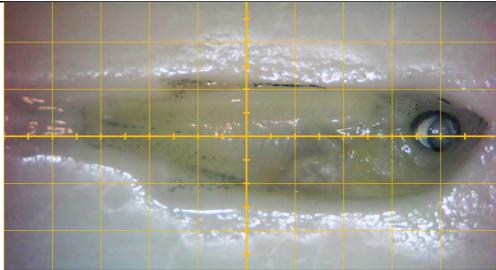
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RAMBOLL

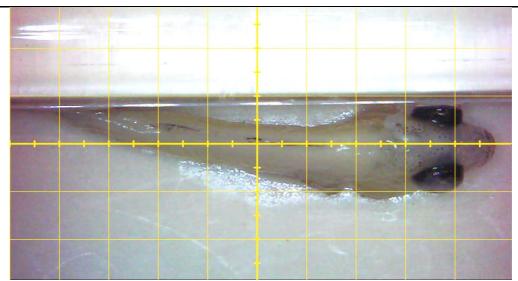


RAMBOLL

Recorder: AJS		N	lotes:		
Primary Fish Health Assessor: RL		RL Si	Six yellow grids = 1 cm		
Third-Party Assessor:					
Assessment Date(s):	Sep 11-12	, 2018			
Anatomical Category (	(e.g. spine,	fin(s)): Hea	ad		
F	Examples I	From YOY E	Bass Sar	npling Region	(circle one):
-					
	IQ Inlet	LHL1(Rock	xy Arm)	LHL2(Dix Dam)	LHL3 Cove 2HL 6 Cove

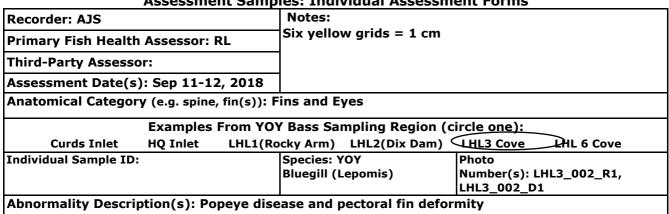


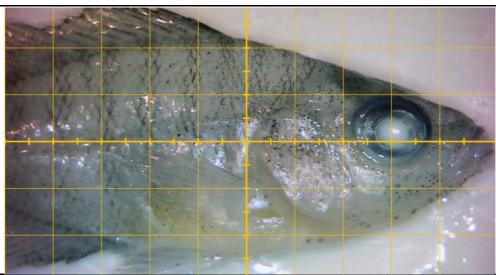
Abnormality Description(s): Craniofacial deformity



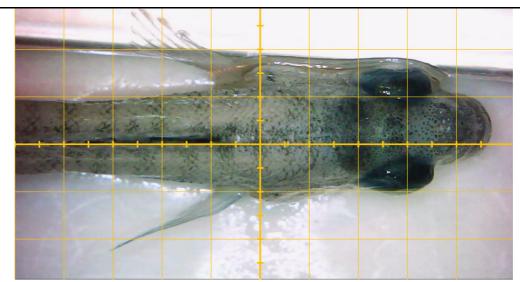
Page 2 of 3

RAMBOLL





Abnormality Description(s): Popeye disease and pectoral fin deformity



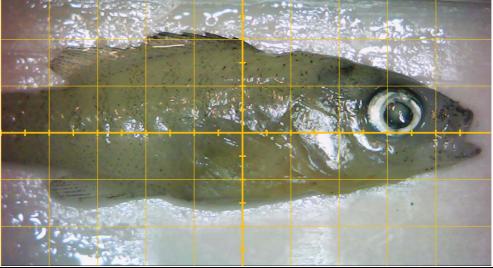
Page 3 of 3



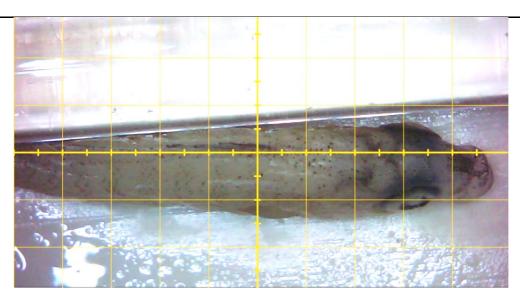
Recorder: AJS Primary Fish Health Assessor: RL		Notes:						
		Six yellow grids = 1 cm						
hird-Party Assesso				fich with	dofo	Total with ant		
Assessment Date(s): Sep 11-12, 2018			deformities		aetormities	. Total without		
		-		N=151				
Anatomical Category	y (e.g. spine,	fin(s)): N	ormai					
	-				(circle one)			
Curds Inlet	HQ Inlet	LHL1(R	locky Arm) Species: YOY			LHL 6 Cove		
Individual Sample ID:			Species: YOY Bluegill (Lepomis)		Photo Number(s	Number(s):		
					HI_Normal_Fish_1to50			
Abnormality Descrip	otion(s): NO	NE						
11								
Inter Math	ASSESSMEN	the line and	i KIEN		405 50	MPLING LOCATION :		
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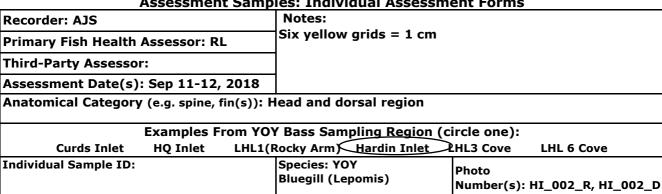
Recorder: AJS			Notes: Six yellow grids = 1 cm					
<b>Primary Fish Health</b>	Assessor: R	L						
Third-Party Assesso	Third-Party Assessor:							
Assessment Date(s)	: Sep 11-12	, 2018						
Anatomical Category			lead and dorsal region					
	Examples F	From YO	Y Bass Sampling Region (	circle one):				
Curds Inlet	HQ Inlet	LHL1(	Rocky Arm) Hardin Inlet	HL3 Cove LHL 6 Cove				
Individual Sample ID:			Species: YOY Bluegill (Lepomis)	Photo Number(s): HI_001_R, HI_001_D				
Abnormality Descrip	tion(s) : Ind	dentatio	n posterior to head					



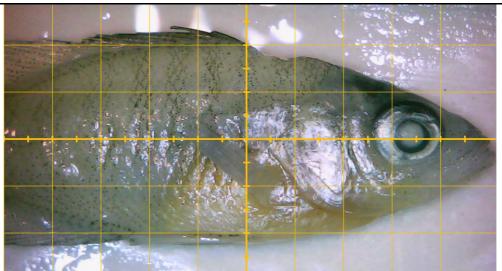
Abnormality Description(s): Indentation posterior to head



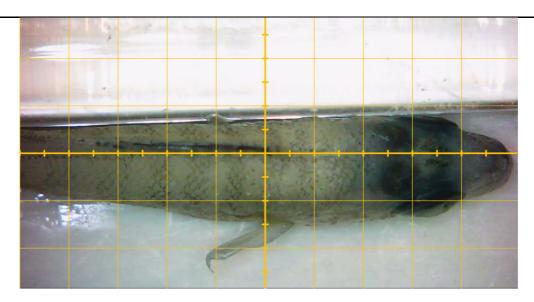
RAMBOLL

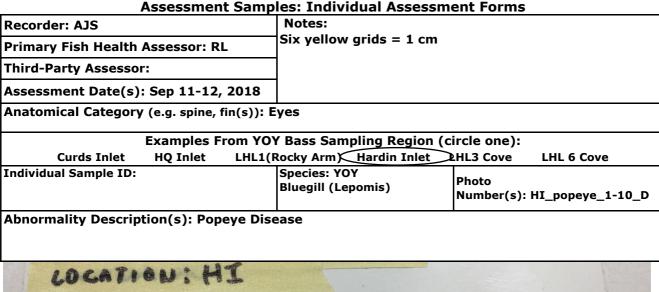


Abnormality Description(s): Indentation posterior to the head

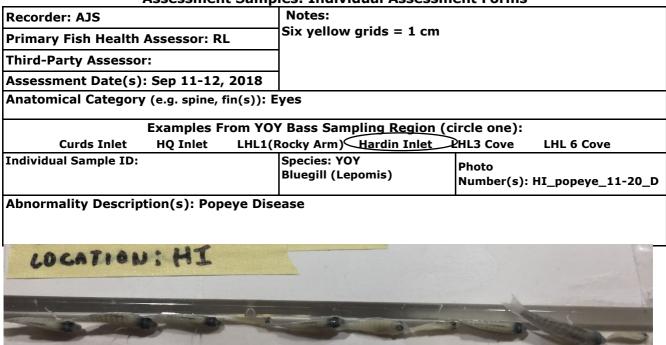


Abnormality Description(s):Indentation posterior to the head







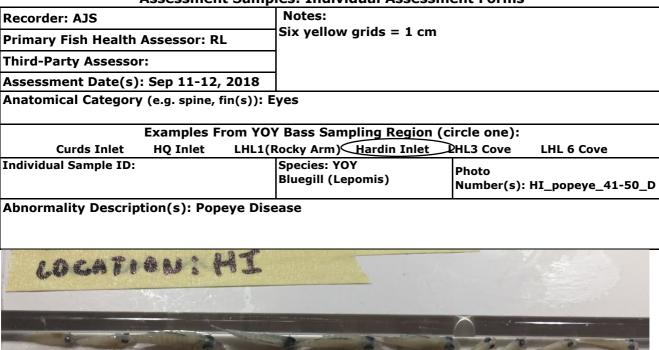


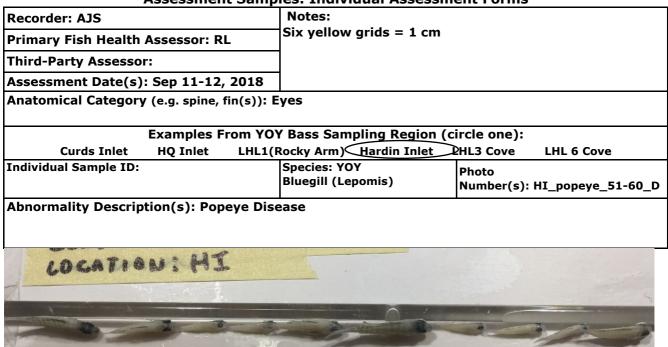


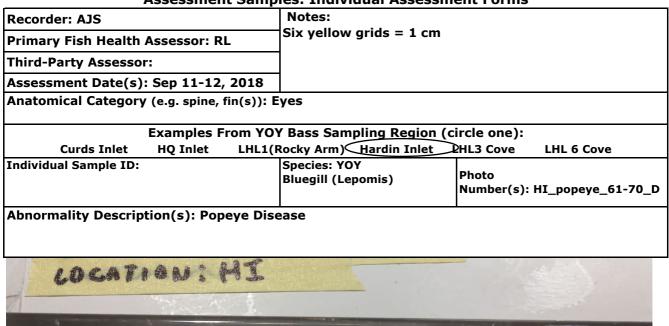
Recorder: AJS			Notes:				
Recorder: AJS							
Primary Fish Health	Assessor: R	L	Six yellow grids = 1 cm				
Third-Party Assessor	1						
Assessment Date(s):	Sep 11-12,	2018					
Anatomical Category	' (e.g. spine, f	fin(s)): <b>E</b>	yes				
	Examples F	rom YO	Y Bass Samp	oling Region (c	circle one):		
Curds Inlet	HQ Inlet	LHL1(	Rocky Arm)🧲	Hardin Inlet	2HL3 Cove LHL 6 Cove		
Individual Sample ID:			Species: YOY (Lepomis)	f Bluegill	Photo Number(s): HI_popeye_21-30_D		
Abnormality Descrip	tion(s): Pop	eye Dis	ease				

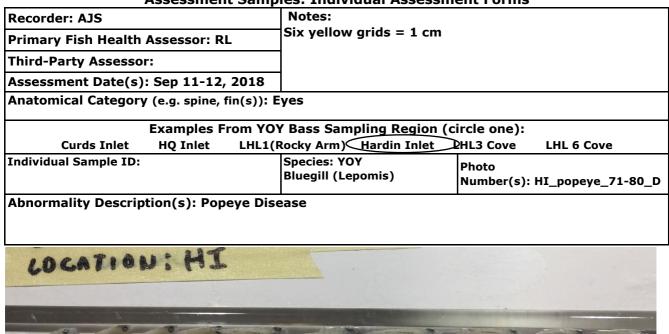


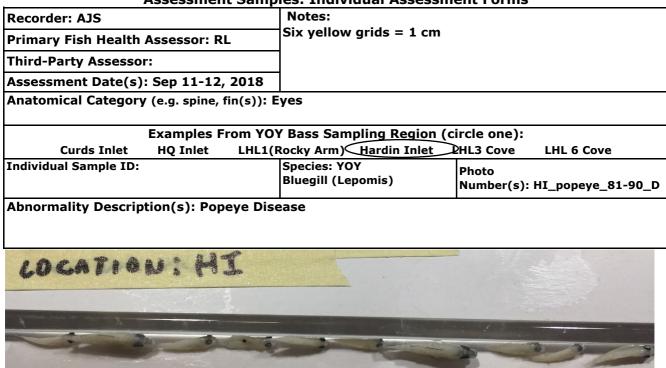
	Attachment I1-3 Young-of-the-Year (YO mples: Individual Asses	
Recorder: AJS	Notes:	
Primary Fish Health Assessor: RL	Six yellow grids = 1 c	m
Third-Party Assessor:		
Assessment Date(s): Sep 11-12, 201	8	
Anatomical Category (e.g. spine, fin(s)	): Eyes	
Examples From	YOY Bass Sampling Region	n (circle one):
Curds Inlet HQ Inlet LHI	L1(Rocky Arm) Hardin Inlet	t PHL3 Cove LHL 6 Cove
Individual Sample ID:	Species: YOY Bluegill (Lepomis)	Photo Number(s): HI_popeye_31-40_D
Abnormality Description(s): Popeye I	Disease	
LOCATION: HI		
	7 5	

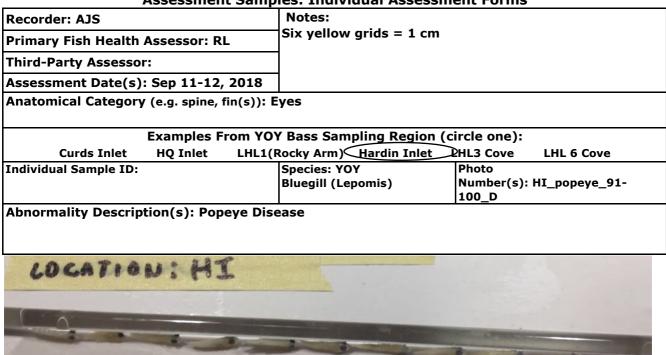


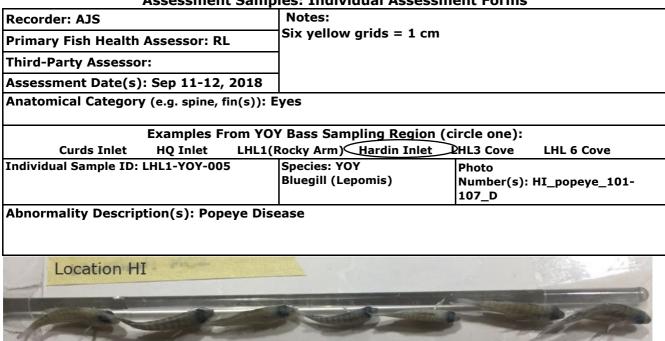




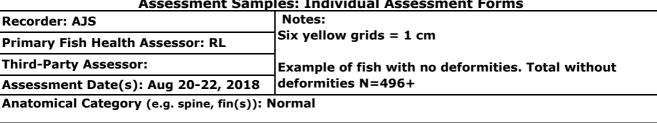








RAMBOLL



	Examples From YOY Bass Sampling Region (circle one):											
Curds Inlet	HQ Inlet	LHL1(Ro	ocky Arm)	LHL2(Dix Dam)	LHL3 Cove	UHL 6 Cove						
Individual Sample ID:			Species: \	YOY	Photo							
			Bluegill (I	Lepomis)	Number(s):							
				. ,	I HI 6 normal	fish 1to50						

Abnormality Description(s): NONE

-				N					
And the second second second second second	KU YOY AS					YOU SAV	MPLINE LOCA	TION!	
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Page 1 of 11

			Attachme	ent I1-3				
	Compl	eted Yo	oung-of-the-Year (YOY) Bluegill					
	Assessme	nt Samp	les: Indi	vidual Assessm	ent Forms			
Recorder: AJS		-	Notes:					
Primary Fish Health	Assessor: I	RL	Six yello	Six yellow grids = 1 cm				
Third-Party Assess		Example	Example of fish with no deformities. Total without					
Assessment Date(s	): Aug 20-22	2, 2018	deformities N=496+					
Anatomical Categor	y (e.g. spine,	, fin(s)): N	Normal					
	Examples	From YO	Y Bass Sa	mpling Region (c	circle one):			
Curds Inlet	HQ Inlet	LHL1(Ro	ocky Arm)	LHL2(Dix Dam)	LHL3 Cove	HL 6 Cove		
Individual Sample ID			Species: \ Bluegill (I		Photo Number(s): LHL6_normal	fish_51to100		
Abnormality Descri	ption(s): NC	DNE						

K	LU YOY AS	SESSMENT	NORMAL I	= 15 H		405 SA	MPLING LOC	ATION !
Δ.	SSESSED P	sy: R. Lockh	DOD SAV	NPLEIMAG	E #; 2	LHL	COUE	
	SSESSMENT	DATE : AUG	20,2018 L	EFT SI	DE:	FISH# SI	-100 of 500	<u> </u>
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	29	30	31	32	33	54	35	
5			E SS	A. Cardo	Ra- AND		2000	
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8	60							7
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Page 2 of 11

			leted You		t I1-3 -Year (YOY) dual Assessm		RAMB	ÓLL
Record	er: AJS			Notes:				
Primary	/ Fish Healt	h Assessor:	RL	Six yellow	grids = 1 cm			
Third-P	arty Assess	sor:		Example of	fish with no o	deformities.	Total withou	t
Assessi	ment Date(	s): Aug 20-2	2, 2018	deformities	5 N=496+			
Anatom	nical Catego	ory (e.g. spine	e, fin(s)): N	ormal				
		Examples	From YO	' Bass Samp	oling Region (	circle one):		
c	Curds Inlet	HQ Inlet		-	HL2(Dix Dam)	LHL3 Cove	UHL 6 Cove	
Individu	al Sample II	D:		Species: YO Bluegill (Lep		Photo Number(s):		
				Biuegiii (Lep	omis)		al_fish_101to	50
	1011	ASSESSMEN	T			held an		
		By: R. LOCK		SAMPLE IM	AGE 4: 2		MPLING LOCA	TION:
		NT DATE : AU		RIGHT		FISH #100		
	ASSEGUIL	L	3	4	5	6	2	
		-				-		
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	15	16	17	18	19	20	21	
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6	36	31	38	39	40	.41	42	
7	48	нч	45	46	ЧТ	48	49	
. 8	50							>

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RAMBOLL

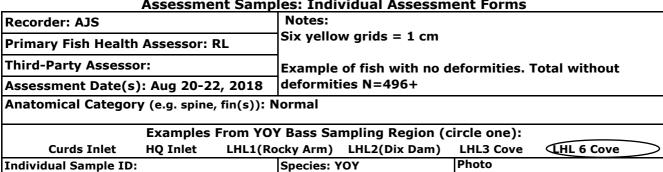
-		Assess	ment Sar	nples: Indiv	<u>idual Asse</u>	ssment Fo	rms				
Recor	der: AJS			Notes:							
Prima	ry Fish Heal	th Assesso	or: RL	Six yellov	Six yellow grids = 1 cm						
Third-	Party Asses	sor:		Example	Example of fish with no deformities. Total without						
Asses	sment Date(	(s): Aug 20	0-22, 2018		es N=496+						
Anato	mical Catego	ory (e.g. sp	oine, fin(s))	: Normal							
		Examp	les From Y	OY Bass Sar	npling Regi	on (circle on	ie):				
	Curds Inlet	HQ Inle		(Rocky Arm)	LHL2(Dix Da	am) LHL3 C		ove			
Indivic	dual Sample I	D:		Species: Y Bluegill (L		Photo Numbe LHL6 r	r(s): iormal_fish_151	to200			
Abnor	mality Desc	ription(s):	NONE								
F	KU YOY A		the second se				SAMPLINE LOC	ATION !			
4	ASSESSED		10.00 million and 10.000 million and	SAMPLEIN			HL & COUE				
	SME	N DATE !!	AUS 20, 201 3		SIDE:		#151-200 of 50	0			
		L		4	5	6					
	-	9	10	II 	12	3	14				
	3 15	14	7	9		20	21				
1	1	13	24	15	26	17	218.				
5	5	30	31	32	33	34	35				
6	36	37	38	31	40	н	H2				
٦	43	44	45	46	Ч	46	49				
8	50							} 2 cm			

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RAMBOLL

Number(s):

LHL6\_normal\_fish\_201to250



**Bluegill (Lepomis)** 

Abnormality Description(s): NONE

Individual Sample ID:

				NORMAL WOOD SA	FISH MPLE IMAG	E 4: 5		6 COUE	CION !
1					RIGHTSI		FISH#20	1-250 of 500	
	1	1	L	3	4	5	6	2000	
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5	5	21	30	31	32	33	54	35	
	6	36	37	38	39	40	41	42	
	7	48	нч	45	46	47	48	49	
	8	50			-			3	2.Cm
			2	3	4	5	6	7300	

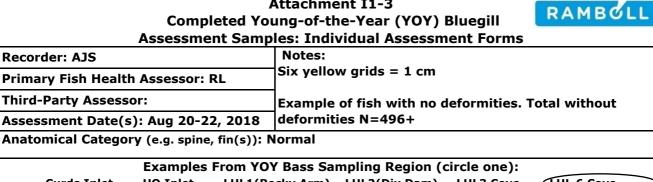
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RAMBOLL

	Assessme		es: Individ	ual Assess	ment Forn	15		
Recorder: AJS			Notes:					
Primary Fish Health	Assessor:	RL	Six yellow g	rids = 1 cm				
Third-Party Assess	or:		Example of fish with no deformities. Total without					
Assessment Date(s	): Aug 20-2		deformities N=496+					
Anatomical Categor	y (e.g. spine	e, fin(s)): No	ormal					
	Examples		Bass Sampl		• •			
Curds Inlet	HQ Inlet	LHL1(Roc		L2(Dix Dam)		re (HL 6	Cove 🥥	
Individual Sample ID		Species: YOY Bluegill (Lepo	omis)	Photo Number(s	s): ·mal_fish_25	110300		
Abnormality Descri	ption(s): N(	ONE						
KU YOY A	SSESSMEN	To LIAN MAL	<b>F</b> 10.13					
	By: R. LOCK		AMPLE IMAN	ar te (		MPLING LOC	ATION !	
the second se	T DATE: AM		RIGHTS		LHL Fund Bag	6 COUE -300 of 50	0	
1	1	3	4	5	FISH TLS	500 07 90		
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4 22	13	24	25	24	rs	28		
5 2	30	31	32	33	34	35		
6 30	32	38	39	40.	41	42		
7	44	45	46	Ч	46	49		
8		•					}2cm	
	2	3	ч	5	6	7300	-	

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# **Attachment I1-3** Completed Young-of-the-Year (YOY) Bluegill



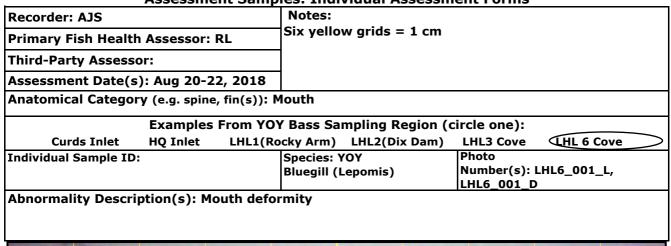
Curds Inlet	HQ Inlet	LHL1(Rocky Arm)	LHL2(Dix Dam)	LHL3 Cove	CHL 6 Cove
Individual Sample ID:		Species: Y	<b>′</b> 0Y	Photo	
-		Bluegill (L	Bluegill (Lepomis)		
				LHL6_norma	_fish_301to350

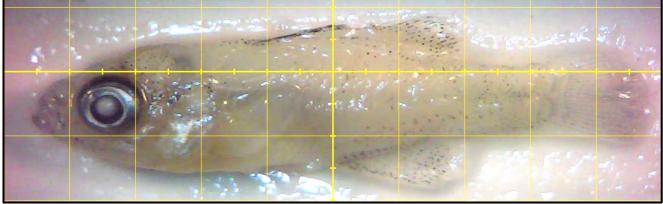
Abnormality Description(s): NONE

	KU YO	ASSESSMENT	T: NORMAL	FISH	= # 7	405 SAV	MPLINE LOCATION !
Jine	ASSESSE	FISH # 301-	= 301-350 of 500				
9	A DE DU	MENT DATE: AM	3	RIGHT SI	5	6	7
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		11	"	18	19	20	21
	4	3	24	15	24	13	18.
	5	30	31	32	33	34	35
	6		18	39	40	41	42
	7	MA 21	45	46	ЧТ	46	49
	8 .						} 2 cm
		2,	3	4	5	6	73000

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RAMBOLL

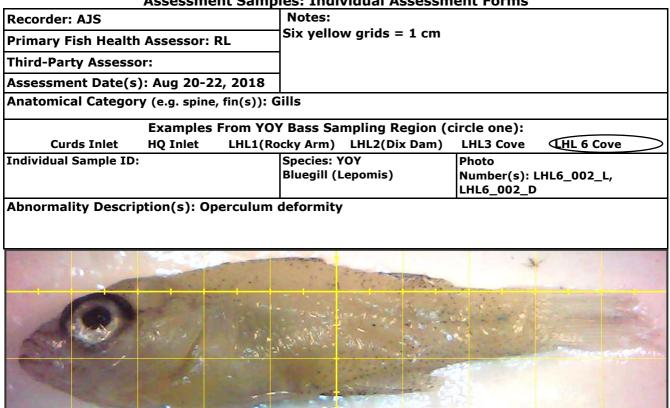




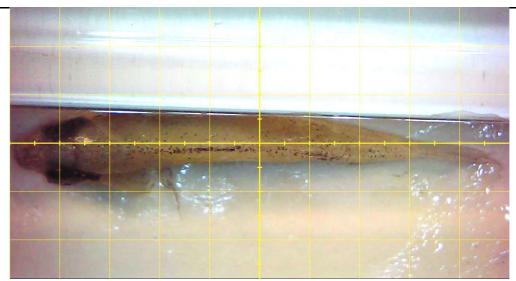
# Abnormality Description(s): Mouth deformity

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RAMBOLL

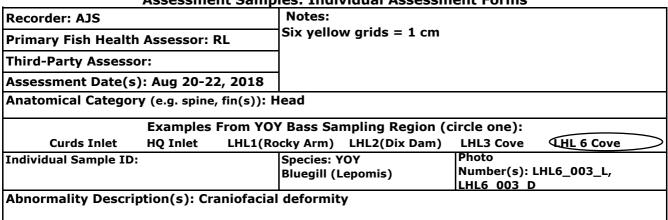


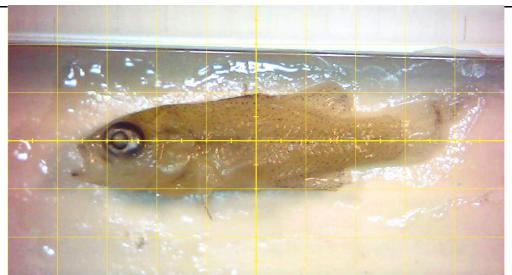
### Abnormality Description(s): Operculum deformity



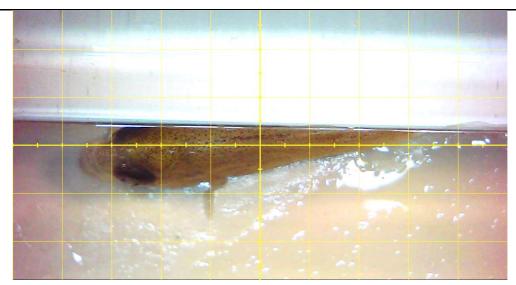
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RAMBOLL



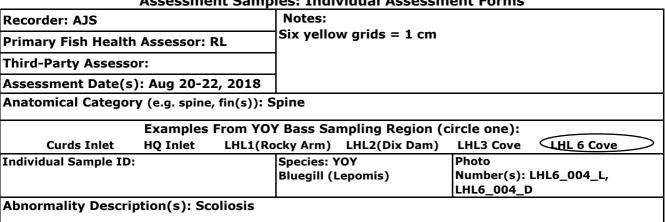


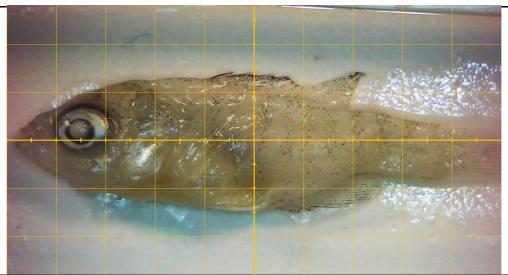
Abnormality Description(s): Craniofacial deformity



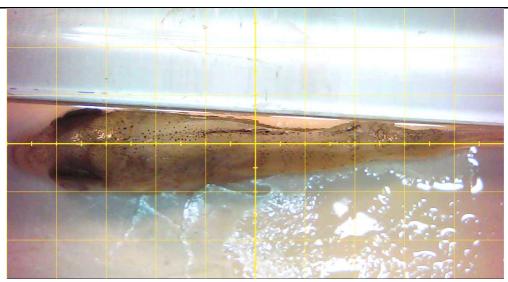
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RAMBOLL





### Abnormality Description(s): Scoliosis



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# APPENDIX I: ECOLOGICAL RISK ASSESSMENT (ERA) SUPPORTING INFORMATION

Attachment I1-4: Completed Third-Party (J. Hawke, LSU) Young-of-the-Year (YOY) Bluegill Assessment Forms



Department of Pathobiological Sciences • School of Veterinary Medicine • Louisiana State University • Baton Rouge, LA 70803

Preliminary assessment of bluegill for Herrington Lake deformity analysis. LHL1 Normal 126 Abnormal 11 – abnormality: spinal curvature (scoliosis)

### LHL6

Normal 125 Abnormal 4 – abnormalities: spinal curvature (scoliosis), atrophied dorsal muscle

HQ Inlet Non-Shock Normal 72 Abnormal 5 – abnormalities: spinal curvature (scoliosis), atrophied dorsal muscle

### **HQ Inlet Shock**

Normal 43 Abnormal 1 – abnormality: spinal curvature (lordosis)

Lower Curds Inlet Normal 150 Abnormal 3 – abnormalities spinal curvature (scoliosis), anchor worm (Lernaea sp. )

Middle Curds Inlet Normal 150 Abnormal – abnormalities: exophthalmia (93), Spinal curvature (5)

**Upper Curds Inlet** Normal 150 Abnormal 5 – abnormality: curved caudal fin

Hardin Inlet

Normal 68 Abnormal 88 – abnormalities: exophthalmia (85), atrophied dorsal muscle (3)

Ather Hah

John P. Hawke PhD Professor, Department of Pathobiological Sciences Section Head, Aquatic Diagnostic Laboratory LSU School of Veterinary Medicine Baton Rouge, LA 70803



Recorder:			Notes:					
Primary Fish Hea	Ith Assessor:							
-	ssor:John P. Hawke							
Assessment Date			# of YOY in sampl	e:155				
-	g Location:Upper	-	s distribution in sample					
Curds Inlet		• •	% percent largem	outh bas	s):100% bluegill			
# of Normal Fish	(no visible deform		50		Assessment Guide for YOY C			
Fish Anatomy	Anatomical Anomaly	# of fish	Anatomical Anomaly	# of <u>fish</u>	exophthalmos Fin irregularities - missing, m			
	Eyes both normal:	155			missing (aka vestigial)			
	Left		Right		Spinal curvature - kyphosis,	ordosis, and		
	normal:		normal:		scoliosis			
Eyes	exophthalmic:		exophthalmic:		Craniofacial defects - mouth	n, jaw, and gill cover		
	opaque:		opaque:		Edema - fluid accumulation			
	missing:		missing:		Note: To avoid multiple-cou	nting of fish with		
	Other (list):		Other (list):		multiple deformities, this form counts th prominent deformity and digital images details of specific fish will also be record			
	Fins all normal:	150	Caudal fin (	tail)		#		
	Left pectora	al	partly missing:	-	Anatomical	of		
	partly missing:		missing:		Anomaly	fish		
Fins	missing:		twisted:	5	Dorsal	fin		
	twisted:							
	Right pector	al	Anal fin		missing:			
	partly missing:		partly missing:		twisted:			
	missing:		missing:		fins other (list):			
	twisted:		twisted:					
	Spine normal:	155			Head Normal:	155		
	kyphosis				mouth			
Spine	lordosis:		Craniofac	ial	jaw:			
	scoliosis:				gill cover:			
	Other (list):				Other (list):			
	normal:	155			dorsal fin			
Edema	Edema:			 	spines	caudal fin		
240114	Other (list):		Fin Meml	brane		(tail) oft rays \		
			upper jaw bone nape Eye Cheek Iower jaw isthmus (throat)					
Other (List)			lower jaw		anus			

Page \_\_\_ of \_\_\_



Recorder:			Notes:			
Primary Fish Hea	Ith Assessor:					
Third-Party Asses	ssor:John P. Hawke					
Assessment Date			# of YOY in sampl	e:248		
YOY Fish Samplir		-	distribution in sam	nple		
Curds Inlet			% percent largem	outh bas		
# of Normal Fish	(no visible deform		50		Assessment Guide for YOY C Eye abnormalities - including	
Fish Anatomy	Anatomical Anomaly	# of fish	Anatomical Anomaly	# of <u>fish</u>	exophthalmos Fin irregularities - missing, misshaped, par	
Eyes	Eyes both normal:	155			missing (aka vestigial)	
	Left		Right		Spinal curvature - kyphosis, l	ordosis, and
	normal:		normal:		scoliosis	
	exophthalmic:	93	exophthalmic:	93	Craniofacial defects - mouth	n, jaw, and gill cover
	opaque:		opaque:		Edema - fluid accumulation Note: To avoid multiple-counting of fish v	
	missing:		missing:			
	Other (list):		Other (list):		multiple deformities, this for prominent deformity and dig details of specific fish will als	gital images and
	Fins all normal:	248	Caudal fin (	tail)		#
	Left pectora	al	partly missing:	,	Anatomical	of
	partly missing:		missing:		Anomaly	fish
Fins	missing:		twisted:		Dorsal	fin
	twisted:				partly missing:	
	Right pector	al	Anal fin		missing:	
	partly missing:		partly missing:		twisted:	
	missing:		missing:		fins other (list):	
	twisted:		twisted:		1	
	Spine normal:	243			Head Normal:	248
	kyphosis				mouth	
Spine	lordosis:		Craniofaci	al	jaw:	
	scoliosis:	5			gill cover:	
	Other (list):	-			Other (list):	
	normal:	248			dorsal fin	
Edema	Edema:	2.0			spines	caudal fit
Lueina	Other (list):		Fin Memb	orane		(tail)
	Other (list).		upper jaw bone nape	<u>the holder of the second s</u>		
			Eye	anta ang ang ang ang ang ang ang ang ang an	STATISTICS AND	
Other (List)			A?	Lateral L	ine Caudal Pedunci	C Constant P
			Cheek	1		Contraction of the second
			lower jaw isthmus	-	anus	
			(throat) ( gill cover gill flap	K	A Carlos	
				ectoral fin p	elvic fin anal spines anal fi	n

Page \_\_\_ of \_\_\_



Recorder:			Notes:						
Primary Fish Hea	Ith Assessor:								
Third-Party Asses	ssor:John P. Hawke	•							
Assessment Date	e(s):9/16/18		# of YOY in sampl	e:153					
YOY Fish Samplir	ng Location:Lower	Species	distribution in sar	nple					
Curds Inlet	.9 _0000.000_00000		0% percent largemouth bass):100% bluegill						
# of Normal Fish	(no visible deform	ities): 15	50		Assessment Guide for YOY C	entrarchidae			
	Anatomical	#	Anatomical #		Eye abnormalities - including exophthalmos	glens cataracts and			
Fish Anatomy	Anomaly	of	Anomaly	of					
	-	fish		fish	Fin irregularities - missing, m missing (aka vestigial)	iisshaped, partly			
	Eyes both normal:	153							
	Left		Right		Spinal curvature - kyphosis, scoliosis	ordosis, and			
Eyes	normal:		normal:		4				
Lyes	exophthalmic:		exophthalmic:		Craniofacial defects - mouth Edema - fluid accumulation	n, jaw, and gill cover			
	opaque:		opaque:						
	missing:		-	3		multiple-counting of fish with			
	Other (list):		Other (list):	multiple deformities, this form counts the prominent deformity and digital images and					
					details of specific fish will als	o be recorded.			
	Fins all normal:	153	Caudal fin (	tail)		#			
	Left pector	al	partly missing:	-	Anatomical	of			
	partly missing:		missing:		Anomaly	fish			
Fins	missing:		twisted:		Dorsal	fin			
	twisted:				partly missing:				
	Right pector	al	Anal fin		missing:				
	partly missing:		partly missing:		twisted:				
	missing:		missing:		fins other (list):				
	twisted:		twisted:						
	Spine normal:	151			Head Normal:	153			
	kyphosis				mouth				
Spine	lordosis:		Craniofac	ial	jaw:				
	scoliosis:	2			gill cover:				
	Other (list):				Other (list):				
	normal:				dorsal fin				
Edema	Edema:				- spines	caudal fin			
Eacilia	Other (list):		Fin Mem	brane		oft rays (tail)			
		I	upper jaw bone nape						
	Anchor worm	1	Eye	13.101.2714	Surger and S	A STREAM			
Other (List)			Cheek	Lateral Li	ne Caudal Pedunc	Constant Provide State			
						Contraction of the second			
			lower jaw		anus				
			(throat) ( gill cover gill flap		lvic fin				
				ectoral fin pc	anal spines anal fi	n			

Page \_1\_ of 1\_\_\_



Recorder:			Notes:					
Primary Fish Hea	Ith Assessor:		1					
Third-Party Asses	ssor:John P. Hawke		-					
Assessment Date	(s):9/17/18		# of YOY in samp	e:77				
YOY Fish Samplin Inlet Not Shock	ng Location:HQ		ies distribution in sample 80% percent largemouth bass):100% bluegill					
# of Normal Fish	(no visible deform	ities): 7	2		Assessment Guide for YOY	Centrarchidae		
Fish Anatomy	Anatomical Anomaly	# of fish	Anatomical Anomaly	# of fish	Eye abnormalities - includin exophthalmos Fin irregularities - missing, r	-		
	Eyes both normal:	77			missing (aka vestigial)			
	Left		Right		Spinal curvature - kyphosis,	lordosis, and		
_	normal:		normal:		scoliosis			
Eyes	exophthalmic:		exophthalmic:		Craniofacial defects - mout			
	opaque:		opaque:		Edema - fluid accumulation			
	missing:		missing:		Note: To avoid multiple-cou	•		
			Other (list):		multiple deformities, this form counts th prominent deformity and digital images details of specific fish will also be record			
	Fins all normal:	77	Caudal fin (	tail)		#		
	Left pector	al	partly missing:		Anatomical	of		
	partly missing:		missing:		Anomaly	fish		
Fins	missing:		twisted:		Dorsal	fin		
	twisted:				partly missing:			
	Right pector	al	Anal fin		missing:			
	partly missing:		partly missing:		twisted:			
	missing:		missing:		fins other (list):			
	twisted:		twisted:					
	Spine normal:	75			Head Normal:	77		
	kyphosis				mouth			
Spine	lordosis:		Craniofac	ial	jaw:			
	scoliosis:	2			gill cover:			
	Other (list):				Other (list):			
	normal:	77	]		dorsal fin			
Edema	Edema:			-ر مر	spines	caudal fir		
	Other (list):		Fin Mem	prane	Station 18	oft rays		
Other (List)	atrophied dorsal muscle	3	upper jaw bone nape Eye Cheek Iower jaw isthmus International Antional Anti					
			(throat) ( gill cover gill flap P	ectoral fin po	elvic fin anal spines anal f	īn		

Page \_\_\_ of \_\_\_



Recorder:			Notes:			
Primary Fish Hea	Ith Assessor:					
Third-Party Asses	ssor: John P. Hawk	e				
Assessment Date	(s): 9/17/18		# of YOY in sampl	e:44		
YOY Fish Samplir		Species	distribution in sar			
Inlet shock		-	% percent largem	-	s): 100% bluegill	l
# of Normal Fish	(no visible deform	ities): 43	3		Assessment Guide for YOY C	entrarchidae
	Anatomical	#	Anatomical #		Eye abnormalities - including exophthalmos	glens cataracts and
Fish Anatomy	Anomaly	of	Anomaly	of		
	-	fish		fish	Fin irregularities - missing, m missing (aka vestigial)	iisshaped, partly
	Eyes both normal:	44				
	Left		Right		Spinal curvature - kyphosis, l scoliosis	ordosis, and
Evoc	normal:		normal:			
Eyes	exophthalmic:		exophthalmic:		Craniofacial defects - mouth, jaw, and gil Edema - fluid accumulation	
	opaque:		opaque:			
	missing:		missing:		Note: To avoid multiple-cour multiple deformities, this for	-
	Other (list):		Other (list):		prominent deformity and dig	
					details of specific fish will als	o be recorded.
	Fins all normal:	44	Caudal fin (	tail)		#
	Left pector	al	partly missing:		Anatomical Anomaly	of
	partly missing:		missing:		Anomaly	fish
Fins	missing:		twisted:		Dorsal	fin
	twisted:				partly missing:	
	Right pector	ral	Anal fin		missing:	
	partly missing:		partly missing:		twisted:	
	missing:		missing:		fins other (list):	
	twisted:		twisted:			
	Spine normal:	43			Head Normal:	44
0	kyphosis				mouth	
Spine	lordosis:	1	Craniofac	ai	jaw:	
	scoliosis:				gill cover:	
	Other (list):				Other (list):	
	normal:	44			dorsal fin	
Edema	Edema:		Fin Mem	orane 🖌 🖌	spines	caudal fir
	Other (list):			MALLE	station rsc	oft rays
			upper jaw bone nape	Service and	~	
			Eye	Lateral Li	ine Caudal Pedunci	R
Other (List)			Cheek	A laterar L	no candal Lennuc	Manager Colds
			lower jaw			Contraction of the second
			isthmus (throat)		anus	
			gill cover gill flap		elvic fin	
	1		pe	ectoral fin	anal spines anal fi	n

Page \_\_\_ of \_\_\_



Recorder:			Notes: Most of the	e fish had	d frayed caudal fi	ns believed			
Primary Fish Heal	th Assessor:		to be an artifact of collection and fixation. Some fish						
-	sor:John P. Hawke		had more than 1 abnormality resulting in the total						
-		,	abnormalities of 1						
Assessment Date		-	# of YOY in samp						
YOY Fish Samplin	g Location:LHL-1	-	distribution in sa	-					
			% percent largem	outh bas					
# of Normal Fish	(no visible deform	-	26		Assessment Guide for YOY				
Fich Anotomy	Anatomical	# of	Anatomical	# of	exophthalmos	0			
Fish Anatomy	Anomaly	fish	Anomaly	fish	Fin irregularities - missing, missh	nisshaped, partly			
	Eyes both normal:	136		11311	missing (aka vestigial)	instruped, para,			
		130	Right		Spinal curvature - kyphosis,	lordosis and			
					scoliosis				
Eyes	normal:	1	normal:						
_,	exophthalmic:	1	exophthalmic:		Craniofacial defects - mout Edema - fluid accumulation				
	opaque:		opaque:						
	missing:		missing:		Note: To avoid multiple-cou multiple deformities, this fo	0			
	Other (list):		Other (list):		prominent deformity and digital images and				
					details of specific fish will a	lso be recorded.			
	Fins normal	137	Caudal fin (	(tail)		#			
	Left pectora	al	partly missing:		Anatomical Anomaly	of			
	partly missing:		missing:		Anomary	fish			
Fins	missing:		twisted:		Dorsal	fin			
	twisted:				partly missing:				
	Right pector	al	Anal fin		missing:				
	partly missing:		partly missing:		twisted:				
	missing:		missing:		fins other (list):				
	twisted:		twisted:						
	Spine normal:	131			Head Normal:	132			
	kyphosis				mouth	3			
Spine	lordosis:	1	Craniofac	ial	jaw:				
	scoliosis:	5			gill cover:	2			
	Other (list):				Other (list): mus				
					behind head	2			
	normal:	137			dorsal fin				
Edema	Edema:	107			- spines	caudal fin			
Lucina	Other (list):		Fin Mem	brane		(tail)			
			upper jaw bone nape	And the State of the					
	hypertrophy	1	Eye	all to a second					
Other (1:++)			Lateral Line Caudal Pedun			and the second se			
Other (List) Hypertrophy of				LaterarL	augurrendu	CIC Land P			
Hypertrophy of			Cheek	Lateral L	Cabuarretum				
• •			lower jaw	Laterar L	anus y				
Hypertrophy of tissue in gill			lower jaw						

Page 1\_ of  $_1_$ 



Recorder:			Notes: Some fish h	nad <u>mul</u> ti	ple abnormalities.		
Primary Fish Hea	Ith Assessor:					-	
	ssor:John P. Hawke	1					
Assessment Date			# of YOY in sampl	e:156			
YOY Fish Samplin			distribution in sar				
Hardin Inlet			% percent largem		s):100% bluegill		
# of Normal Fish	(no visible deformi	ties): 71	L		Assessment Guide for YOY C	Centrarchidae	
Fish Anatomy	Anatomical Anomaly	# of fish	Anatomical Anomaly	# of fish	Eye abnormalities - including lens cataract exophthalmos Fin irregularities - missing, misshaped, par		
Eyes	Eyes both normal:	71			missing (aka vestigial)		
	Left		Right		Spinal curvature - kyphosis,	lordosis, and	
	normal:		normal:		scoliosis		
	exophthalmic:	85	exophthalmic:	85	Craniofacial defects - mouth, jaw, and gil Edema - fluid accumulation		
	opaque:		opaque:				
	missing:		missing:		Note: To avoid multiple-cou	-	
	Other (list):		Other (list):		multiple deformities, this for prominent deformity and dig details of specific fish will al:	gital images and	
	Fins all normal:	155	Caudal fin (	tail)		#	
	Left pectora	al	partly missing:		Anatomical Anomaly	of	
	partly missing:		missing:		Anomaly	fish	
Fins	missing:		twisted:		Dorsal	fin	
	twisted:				partly missing:	2	
	Right pector	al	Anal fin		missing:		
	partly missing:		partly missing:		twisted:		
	missing:		missing:		fins other (list):		
	twisted:		twisted:				
	Spine normal:	157			Head Normal:	157	
Spine	kyphosis		Craniofac	ial	mouth		
opine	lordosis:		Cramorae		jaw:		
	scoliosis:				gill cover:		
	Other (list):				Other (list):		
	normal:	157			dorsal fin		
Edema	Edema:		Fin Mem	l	spines	caudal fi	
	Other (list):			MILLE	Station of St	oft rays	
Other (List)	atrophied dorsal muscle	3	upper jaw bone nape Eye Lateral Line Caudal Peduncle				
_atrophied dorsal muscle			Lateral Line Caudal Peduncie Cheek lower jaw isthmus (throat)				
			gill cover gill flap	ectoral fin po	elvic fin anal spines anal fi	n	

Page \_\_\_ of \_\_\_



Recorder:			Notes:			
Primary Fish Hea	Ith Assessor:					
-	ssor:John P. Hawke					
Assessment Date			# of YOY in samp	e:129		
YOY Fish Samplin		Species	distribution in sa			
			% percent largem		s):bluegill 100%	
# of Normal Fish	(no visible deform				Assessment Guide for YOY (	Centrarchidae
	` 	#			Eye abnormalities - includin	g lens cataracts and
Fish Anatomy	Anatomical Anomaly	of	Anatomical Anomaly	of	exophthalmos	
	Anomary	fish	Anomary	fish	Fin irregularities - missing, n missing (aka vestigial)	nisshaped, partly
	Eyes both normal:	129				
	Left		Right		Spinal curvature - kyphosis, scoliosis	lordosis, and
-	normal:		normal:		sconosis	
Eyes	exophthalmic:		exophthalmic:		Craniofacial defects - mout	h, jaw, and gill cover
	opaque:		opaque:		Edema - fluid accumulation	
	missing:		missing:		Note: To avoid multiple-cou	-
	Other (list):		Other (list):		multiple deformities, this form counts the prominent deformity and digital images and	
					details of specific fish will al	so be recorded.
	Fins normal	129	Caudal fin (	tail)	 	#
	Left pector	al	partly missing:		Anatomical	of
	partly missing:		missing:		Anomaly	fish
Fins	missing:		twisted:		Dorsal	fin
	twisted:				partly missing:	
	Right pectoral		Anal fin		missing:	
	partly missing:		partly missing:		twisted:	
	missing:		missing:		fins other (list):	
	twisted:		twisted:			
	Spine normal:	125			Head Normal:	129
	kyphosis				mouth	
Spine	lordosis:		Craniofac	ial	jaw:	
	scoliosis:	3			gill cover:	
	Other (list):				Other (list):	
	normal:	129			dorsal fin	
Edema	Edema:	125			- spines	caudal fin
Lucina	Other (list):		Fin Mem	brane	×1.	(tail) oft rays
		 	upper jaw bone nape	a and the second		
	atrophied dorsal	1	Eye	3.3.463 H 1804	A Constanting	K
Othory(1)	muscle			Lateral Li	ne Caudal Peduno	C Contraction
Other (List)			Cheek	A.	-	Contraction of the second
			lower jaw isthmus		anus	
			(throat) ( gill cover gill flap	K	duis fin	
				ectoral fin pe	elvic fin anal spines anal f	n
			L			

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# APPENDIX I: ECOLOGICAL RISK ASSESSMENT (ERA) SUPPORTING INFORMATION

Attachment I1-5: Young-of-the-Year (YOY) Bluegill Analytical Samples: Digital Image Log





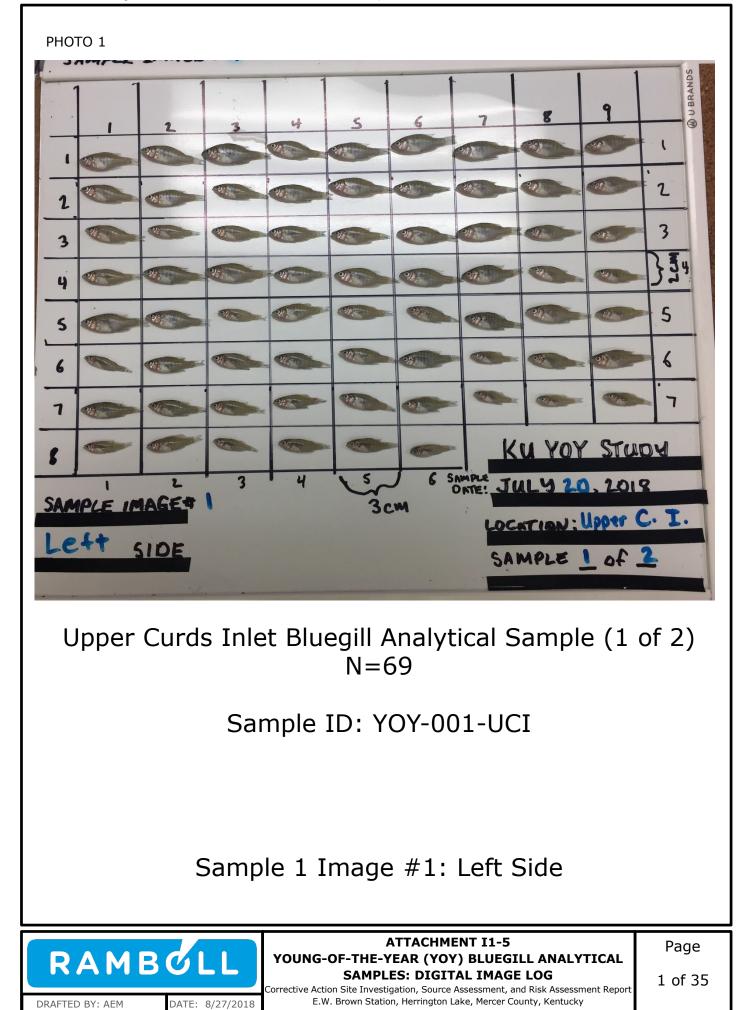
ATTACHMENT I1-5 YOUNG-OF-THE-YEAR (YOY) BLUEGILL ANALYTICAL SAMPLES: DIGITAL IMAGE LOG

Page

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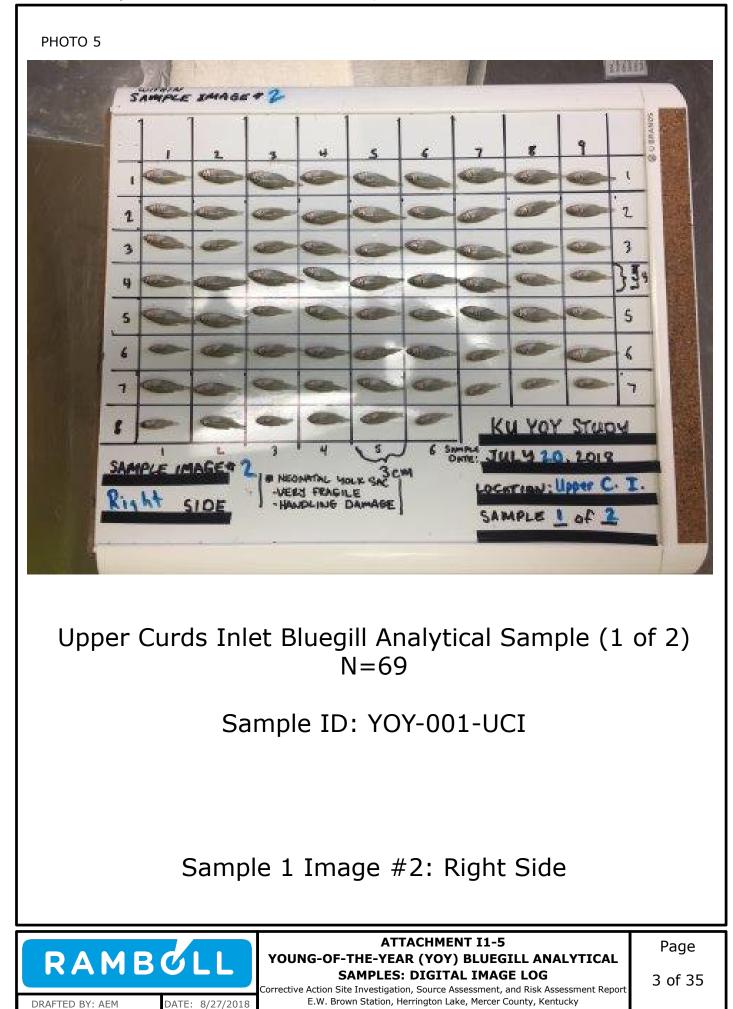


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DATE: 8/27/2018

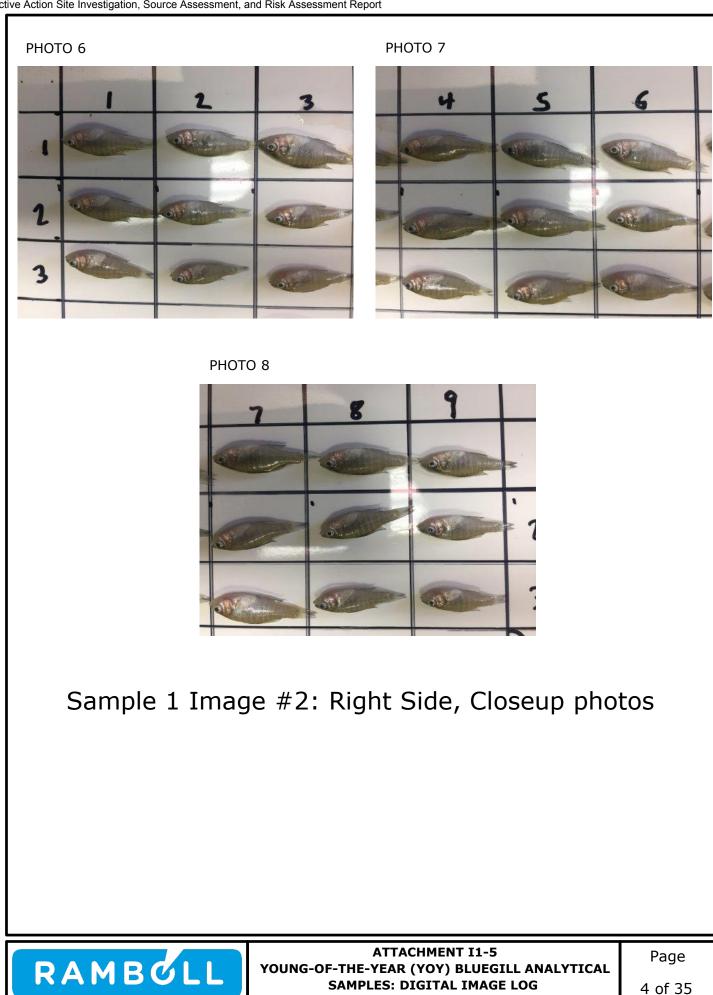
SAMPLES: DIGITAL IMAGE LOG Corrective Action Site Investigation, Source Assessment, and Risk Assessment Report E.W. Brown Station, Herrington Lake, Mercer County, Kentucky

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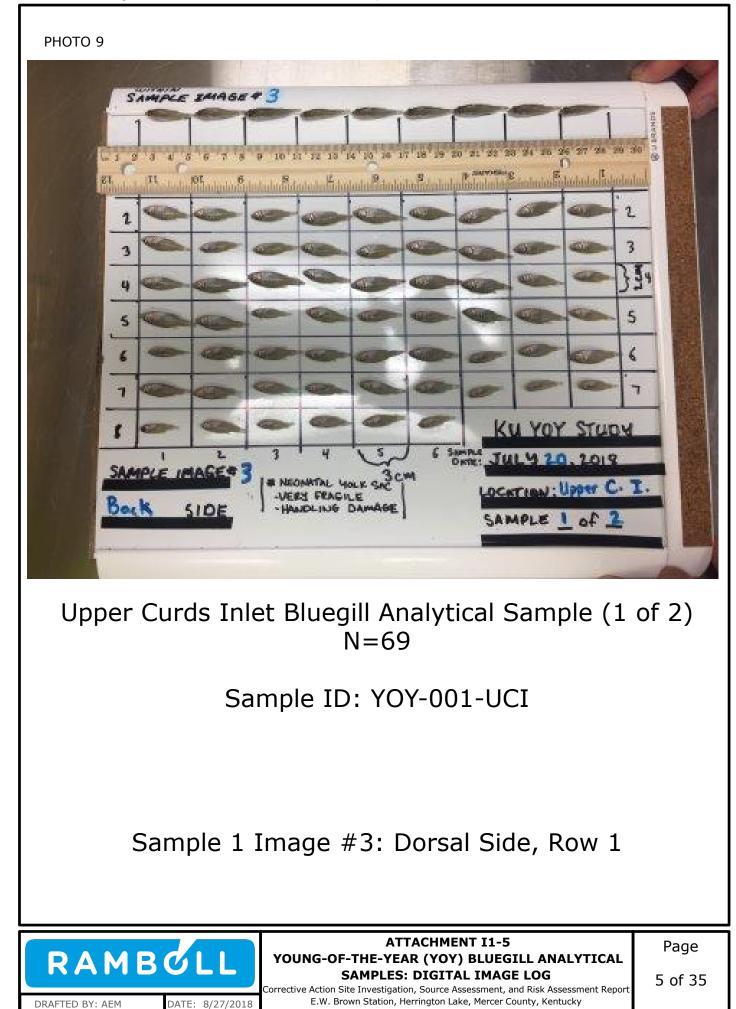


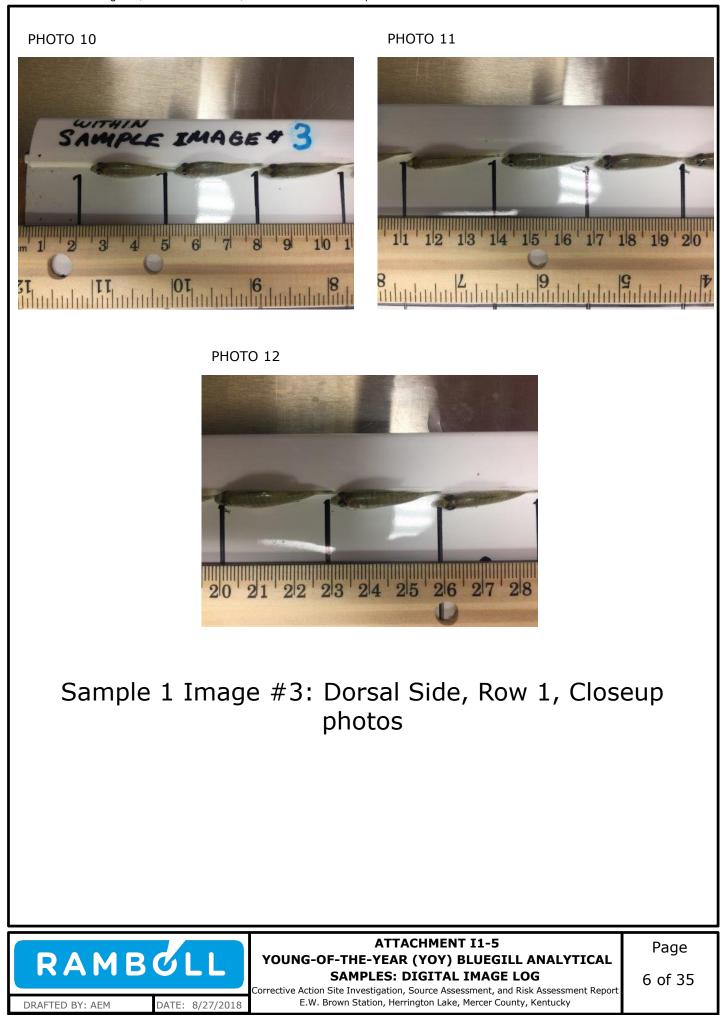
DATE: 8/27/2018

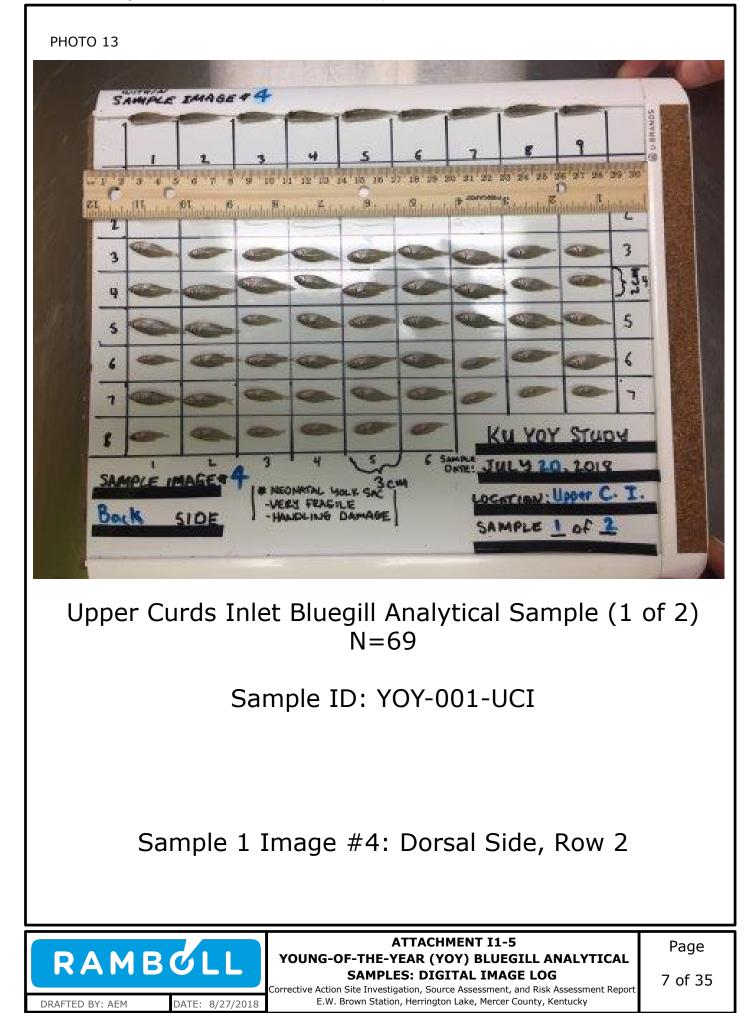
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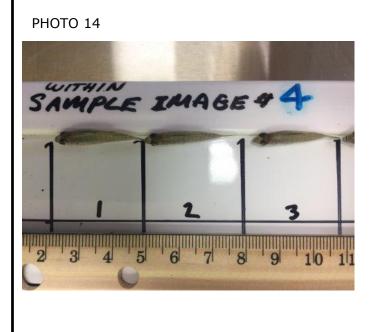
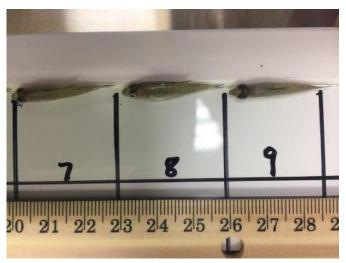


PHOTO 16



**PHOTO 15** 

11 12 13 14 15 16 17 18 19

Sample 1 Image #4: Dorsal Side, Row 2, Closeup photos



ATTACHMENT I1-5 YOUNG-OF-THE-YEAR (YOY) BLUEGILL ANALYTICAL SAMPLES: DIGITAL IMAGE LOG Corrective Action Site Investigation, Source Assessment, and Risk Assessment Report

E.W. Brown Station, Herrington Lake, Mercer County, Kentucky

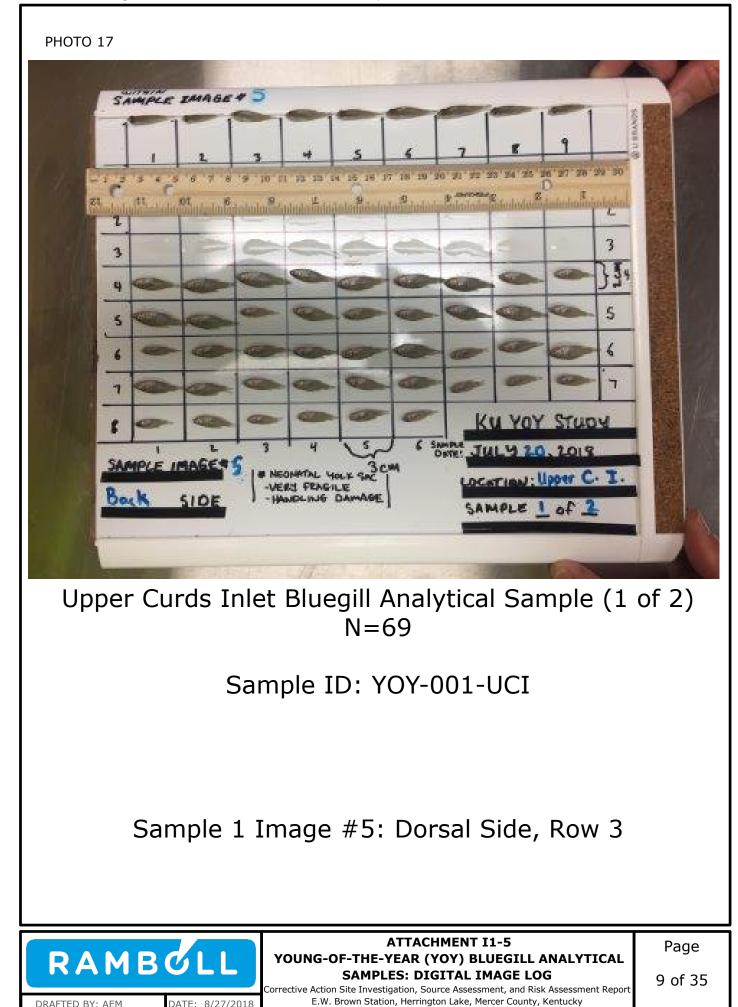
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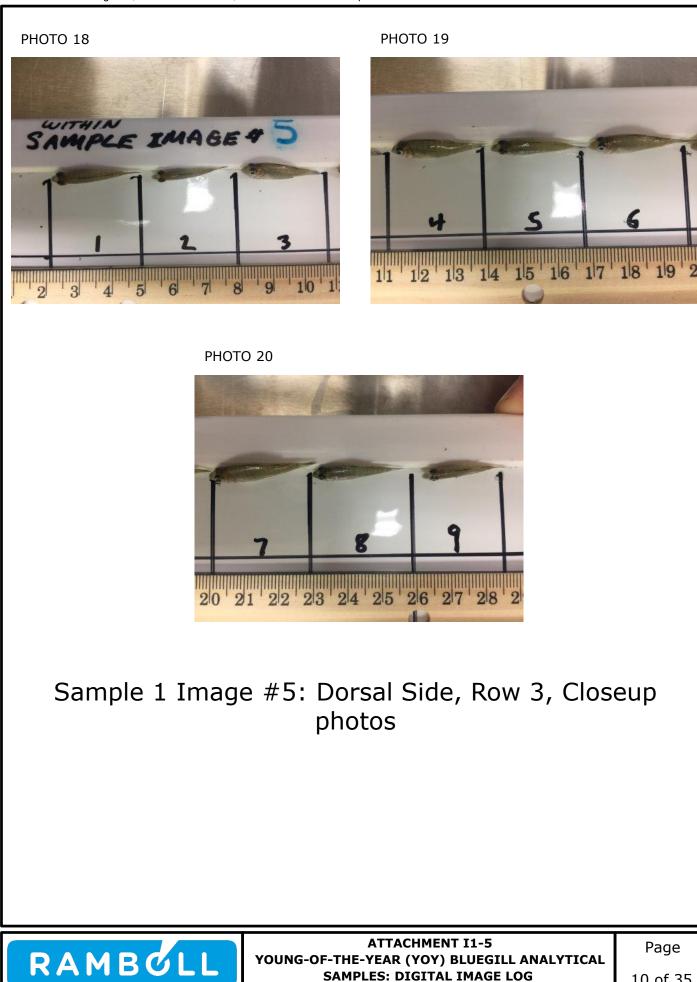
8 of 35

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DATE: 8/27/2018

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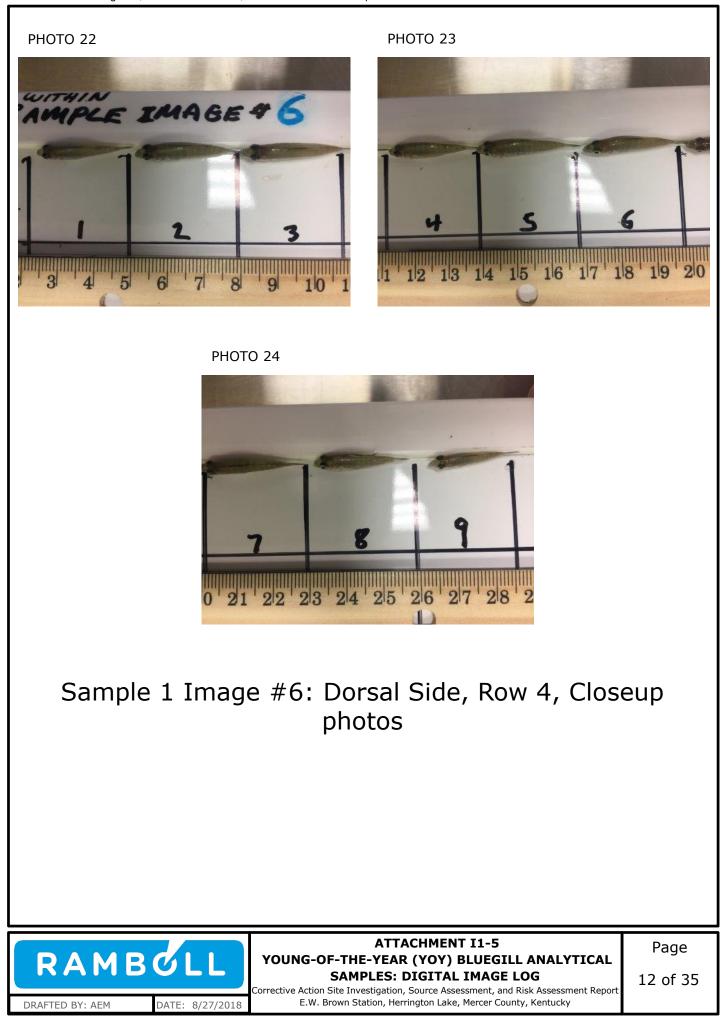
DATE: 8/27/2018

Corrective Action Site Investigation, Source Assessment, and Risk Assessment Report E.W. Brown Station, Herrington Lake, Mercer County, Kentucky

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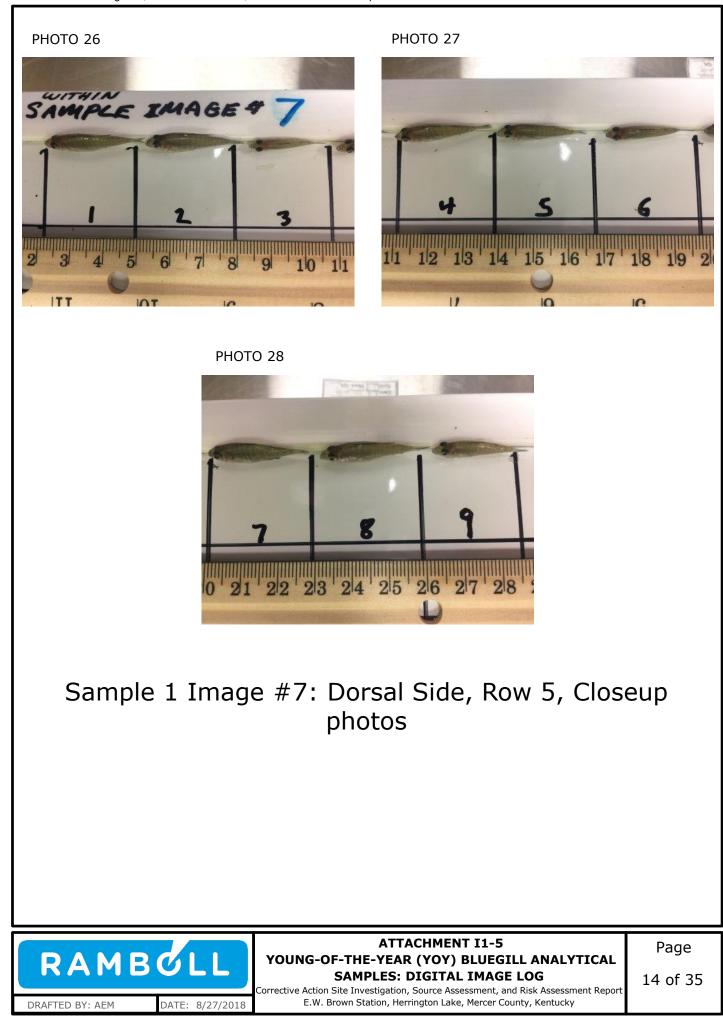
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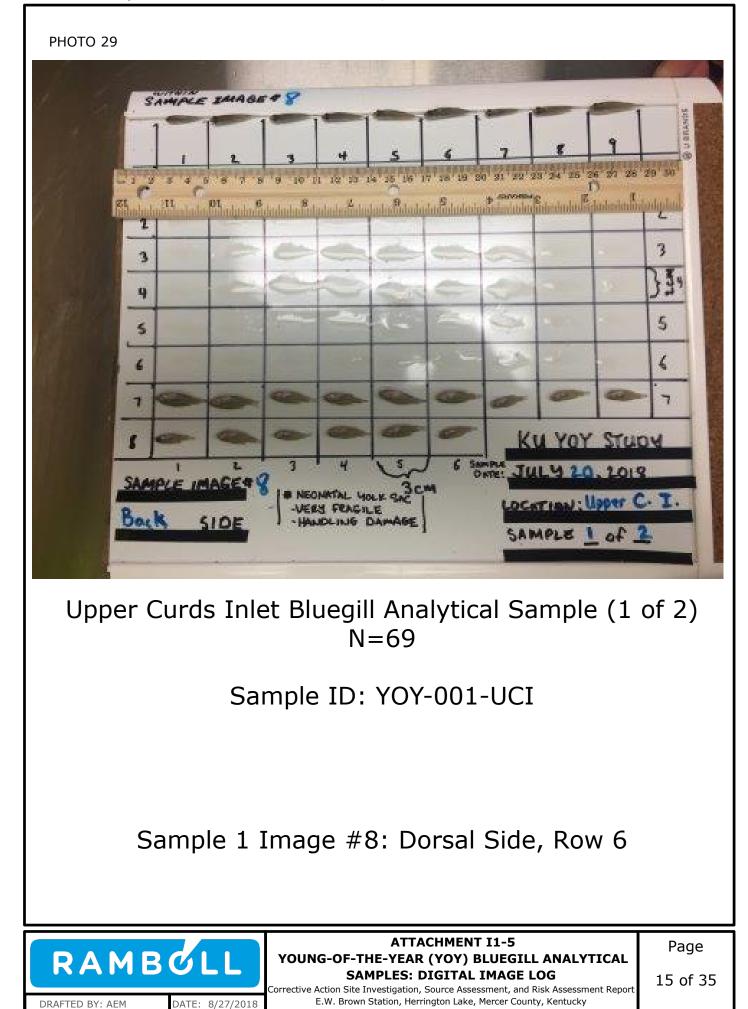
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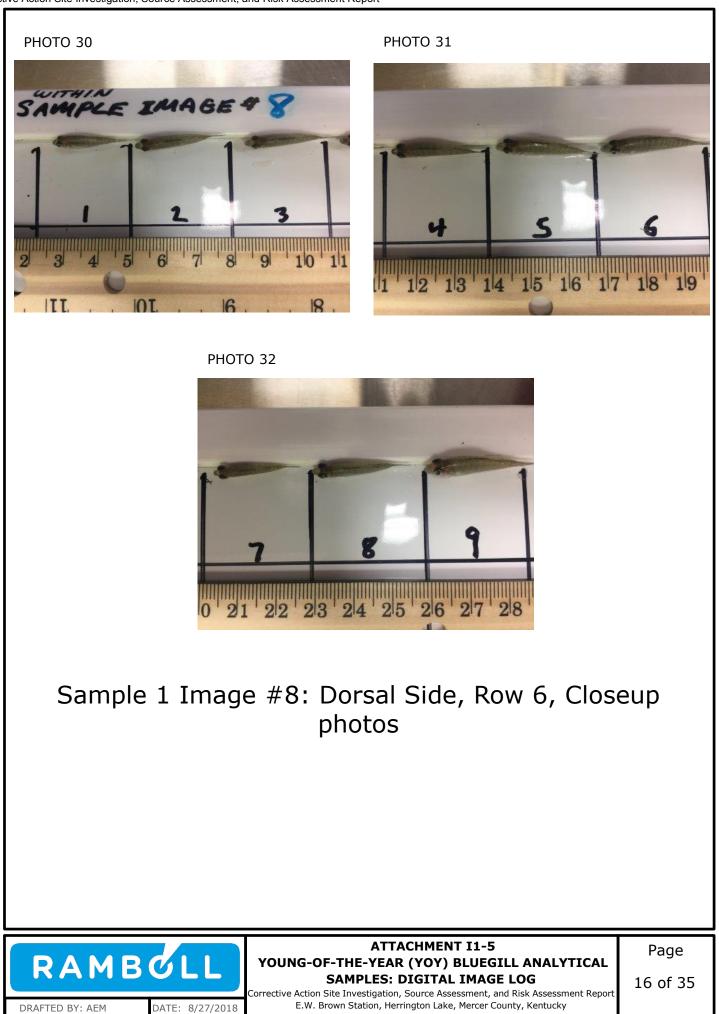


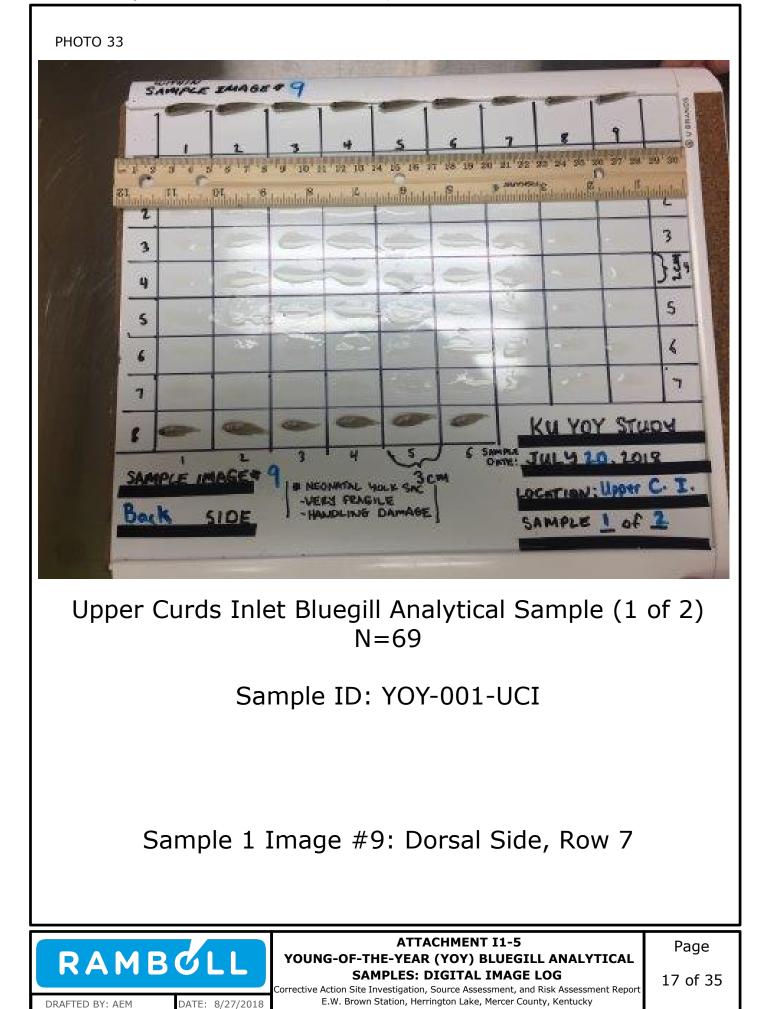
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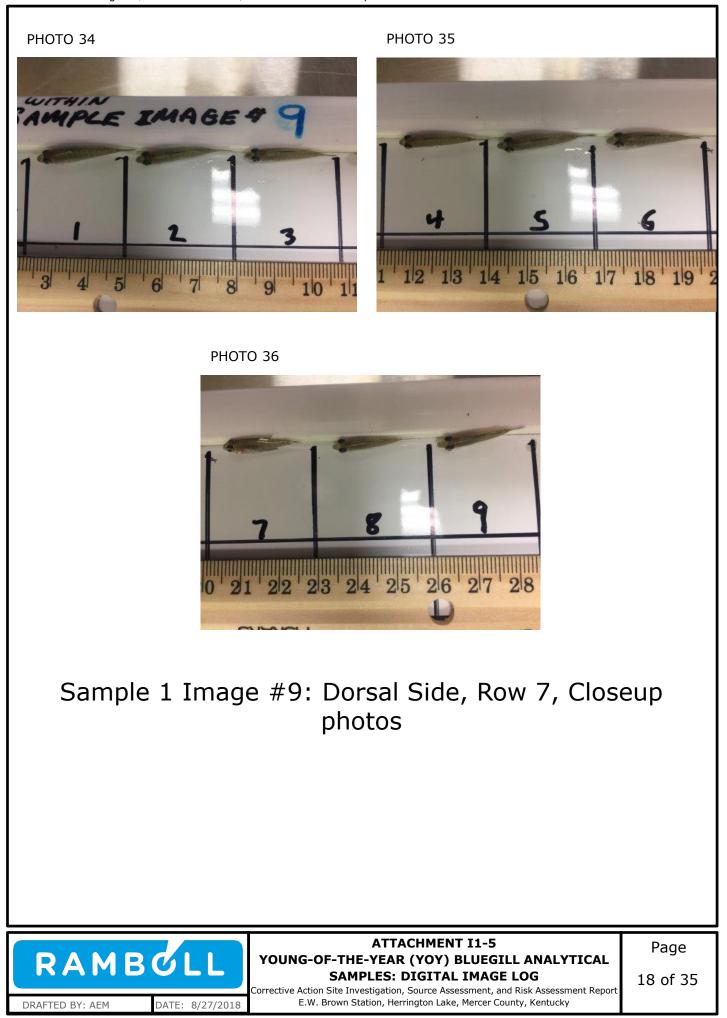
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SAMPLE ZMAGE + 7 1 2 3 4 5 6 7 8 9 1 2 3 4 5 6 7 8 9 1 1 2 13 14 15 16 17 18 18 20 21 22 28 24 25 26 21 25	B I BRANCE
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SAMPLE IMAGES 7 BOLK SIDE SAMPLE LOCATION : Upper ( HANDLING DAMAGE) SAMPLE L OF	C. I.
Upper Curds Inlet Bluegill Analytical Sample (1 N=69	of 2)
Sample ID: YOY-001-UCI	
Sample 1 Image #7: Dorsal Side, Row 5	
ATTACHMENT I1-5 <b>PRACHMENT I1-5</b> <b>YOUNG-OF-THE-YEAR (YOY) BLUEGILL ANALYTICAL</b> <b>SAMPLES: DIGITAL IMAGE LOG</b> Corrective Action Site Investigation, Source Assessment, and Risk Assessment Report E.W. Brown Station, Herrington Lake, Mercer County, Kentucky	Page 13 of 35











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DATE: 8/27/2018

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E.W. Brown Station, Herrington Lake, Mercer County, Kentucky

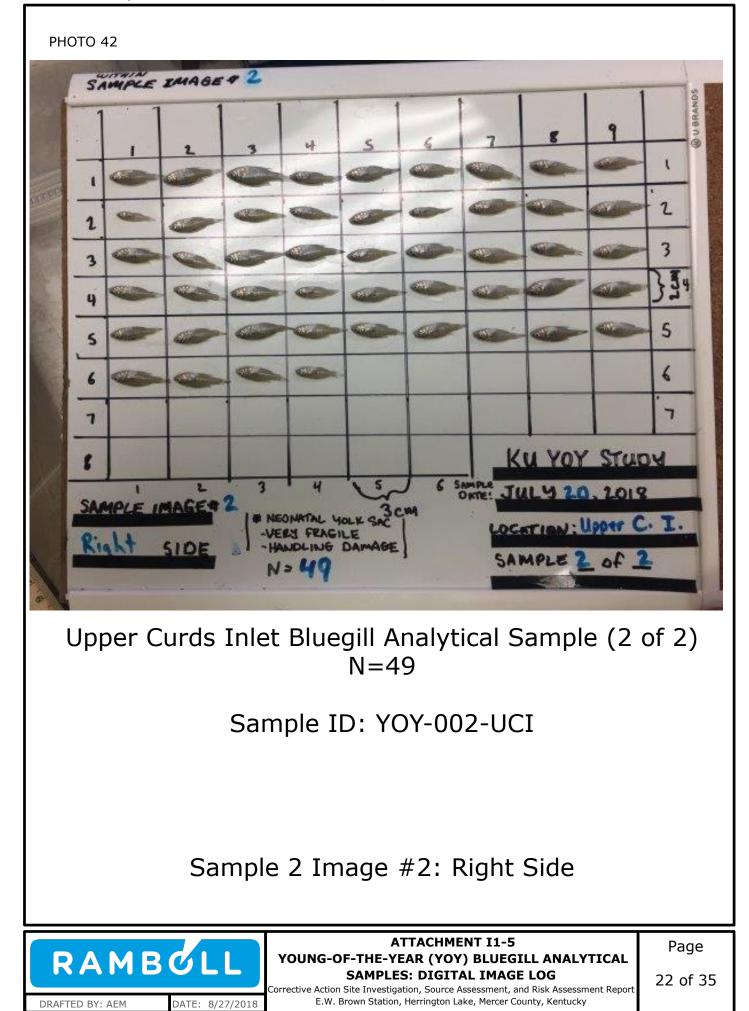
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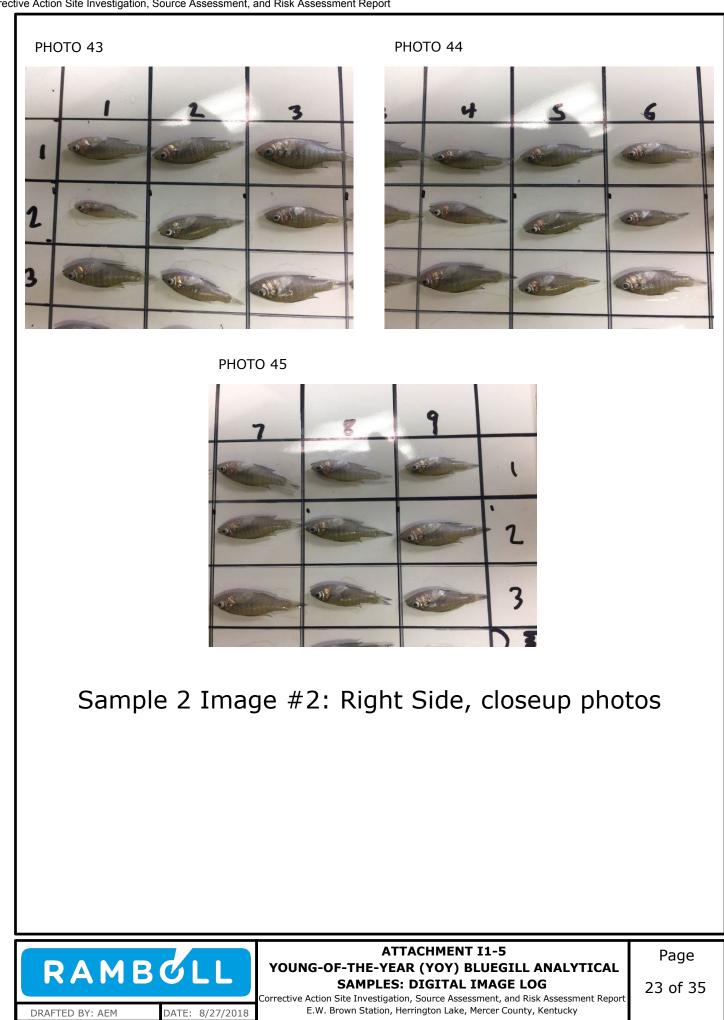


ATTACHMENT I1-5 YOUNG-OF-THE-YEAR (YOY) BLUEGILL ANALYTICAL SAMPLES: DIGITAL IMAGE LOG Corrective Action Site Investigation, Source Assessment, and Risk Assessment Report E.W. Brown Station, Herrington Lake, Mercer County, Kentucky

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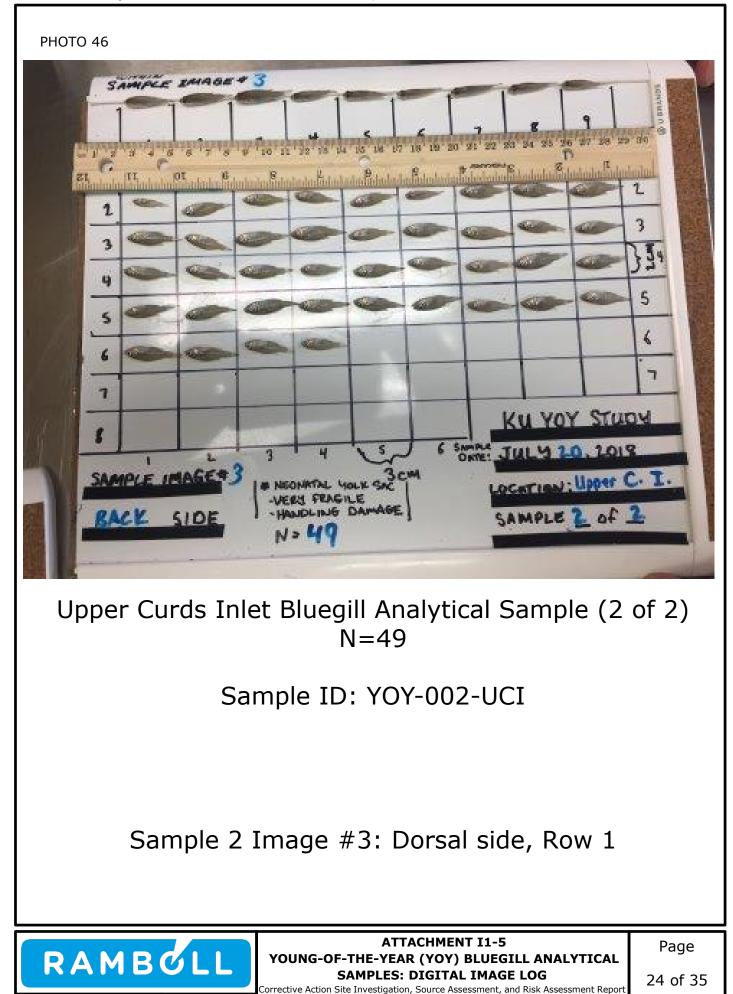






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**PHOTO 48** 

Sample 2 Image #3: Dorsal side, Row 1, closeup photos



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YOUNG-OF-THE-YEAR (YOY) BLUEGILL ANALYTICAL SAMPLES: DIGITAL IMAGE LOG Corrective Action Site Investigation, Source Assessment, and Risk Assessment Report E.W. Brown Station, Herrington Lake, Mercer County, Kentucky

**ATTACHMENT I1-5** 

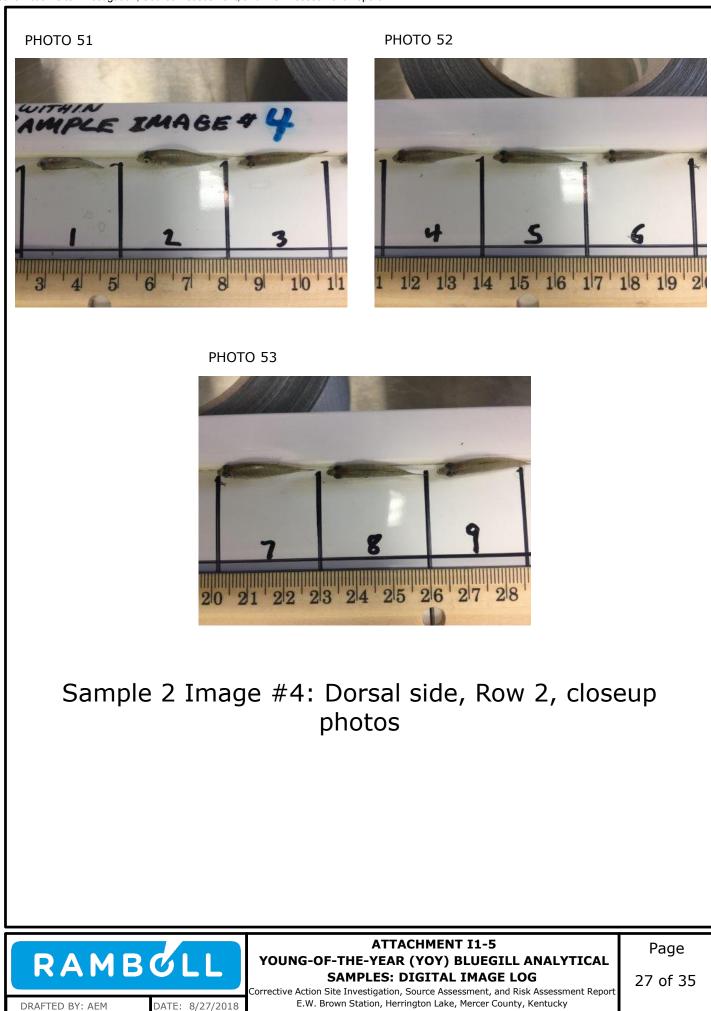
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Sample ID: YOY-002-UCI	
Sample 2 Image #4: Dorsal side, Row 2	
ATTACHMENT I1-5 YOUNG-OF-THE-YEAR (YOY) BLUEGILL ANALYTICAL SAMPLES: DIGITAL IMAGE LOG Corrective Action Site Investigation, Source Assessment, and Risk Assessment Report	Page 26 of 35

E.W. Brown Station, Herrington Lake, Mercer County, Kentucky

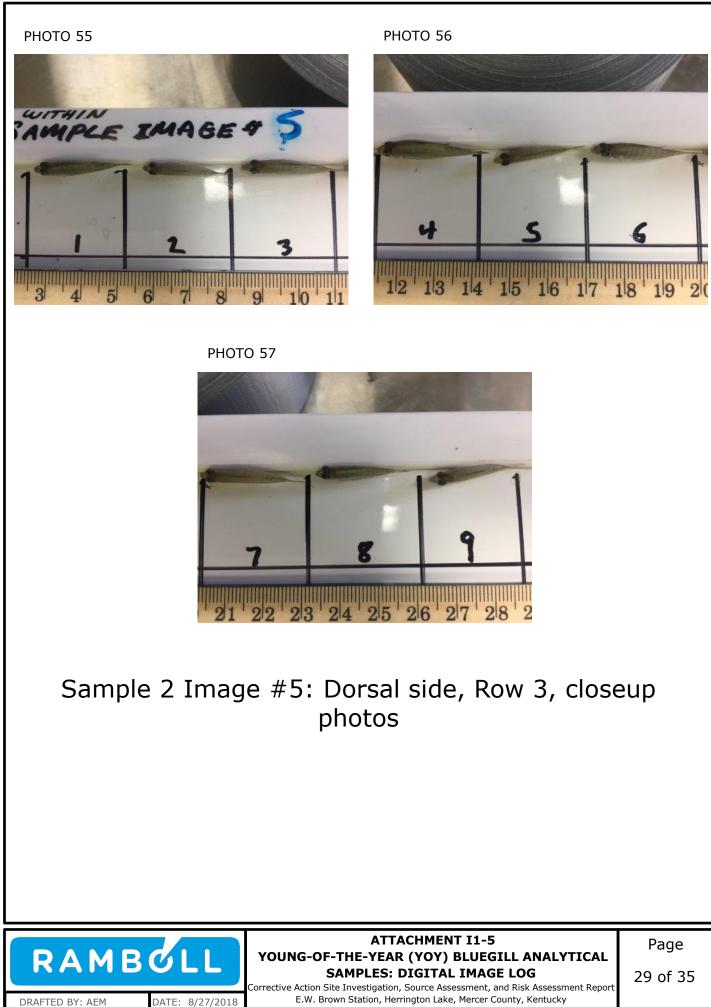


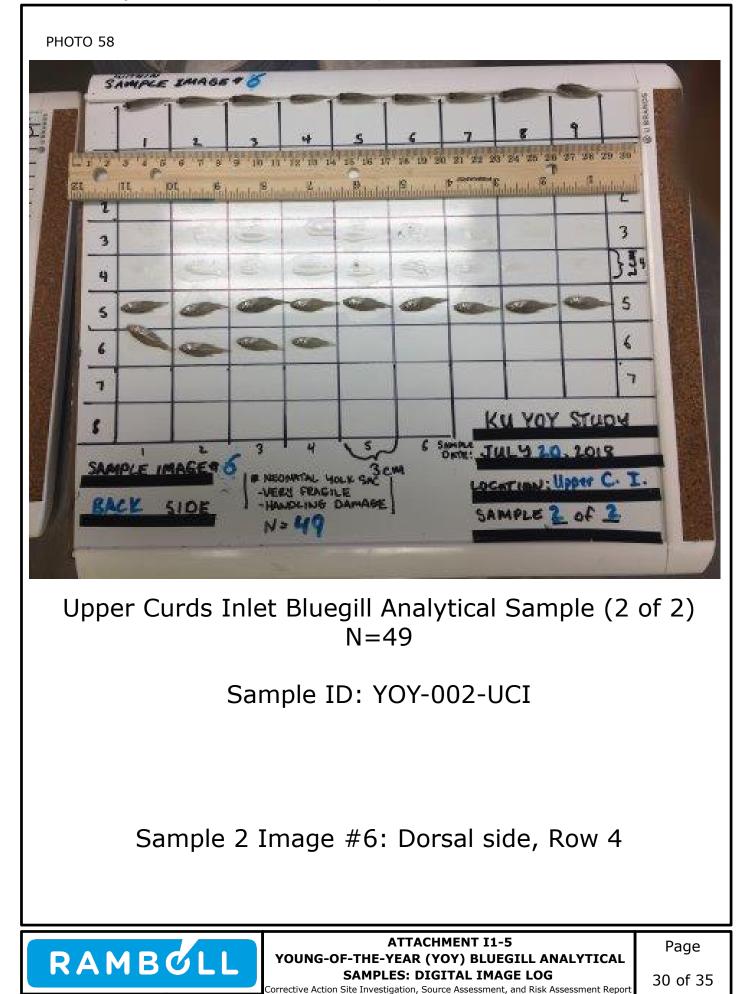
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ATTACHMENT I1-5 YOUNG-OF-THE-YEAR (YOY) BLUEGILL ANALYTICAL SAMPLES: DIGITAL IMAGE LOG Corrective Action Site Investigation, Source Assessment, and Risk Assessment Report	Page 28 of 35

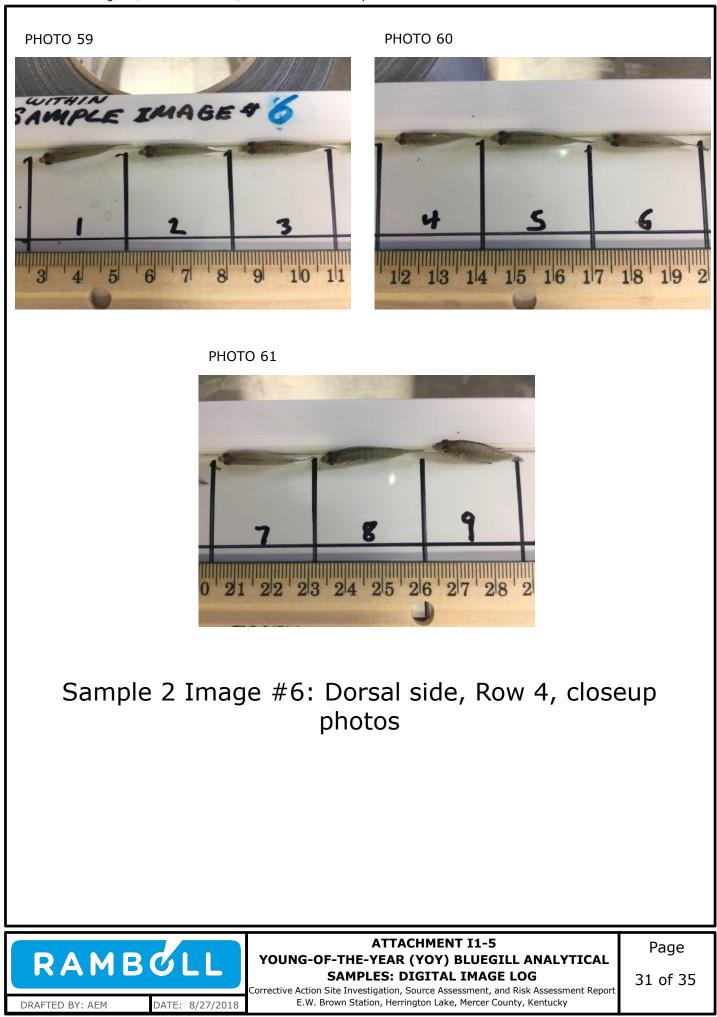
E.W. Brown Station, Herrington Lake, Mercer County, Kentucky





E.W. Brown Station, Herrington Lake, Mercer County, Kentucky

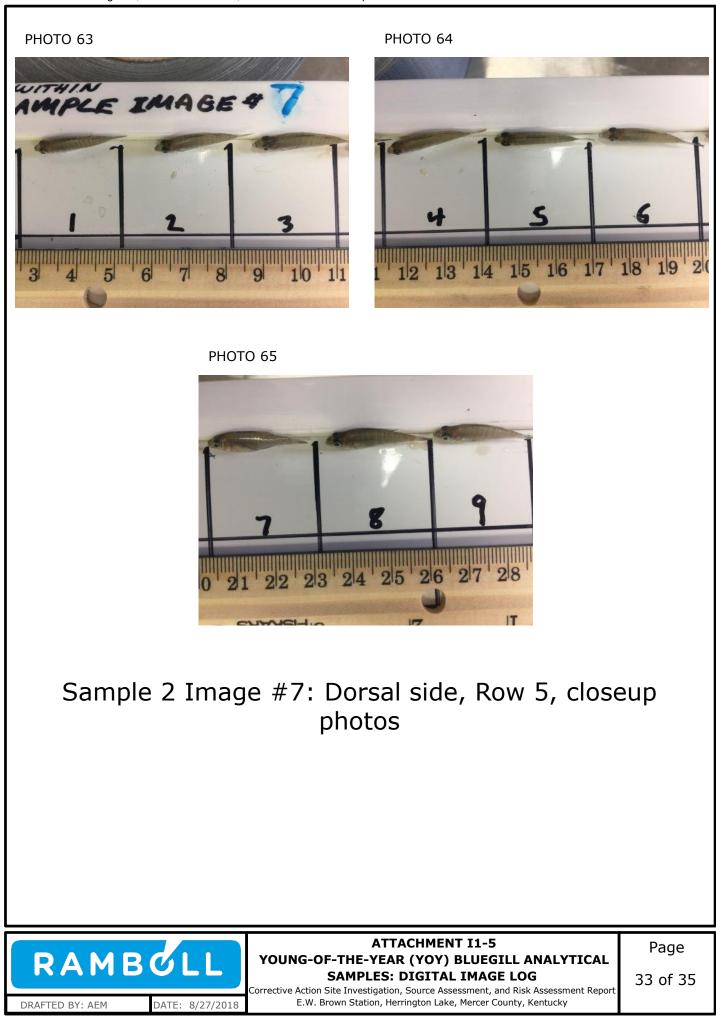
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ATTACHMENT I1-5	Page

E.W. Brown Station, Herrington Lake, Mercer County, Kentucky

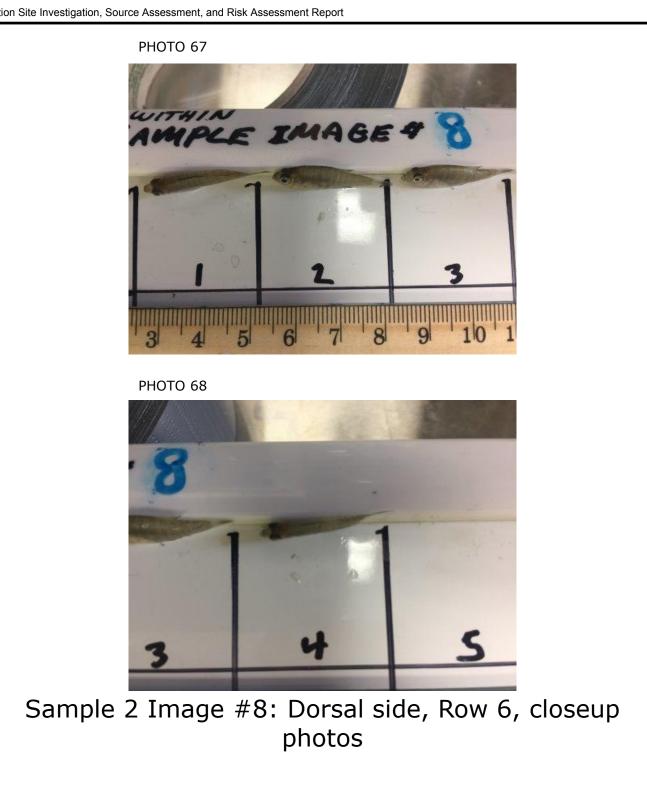
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**ATTACHMENT I1-5** YOUNG-OF-THE-YEAR (YOY) BLUEGILL ANALYTICAL SAMPLES: DIGITAL IMAGE LOG Corrective Action Site Investigation, Source Assessment, and Risk Assessment Report

E.W. Brown Station, Herrington Lake, Mercer County, Kentucky

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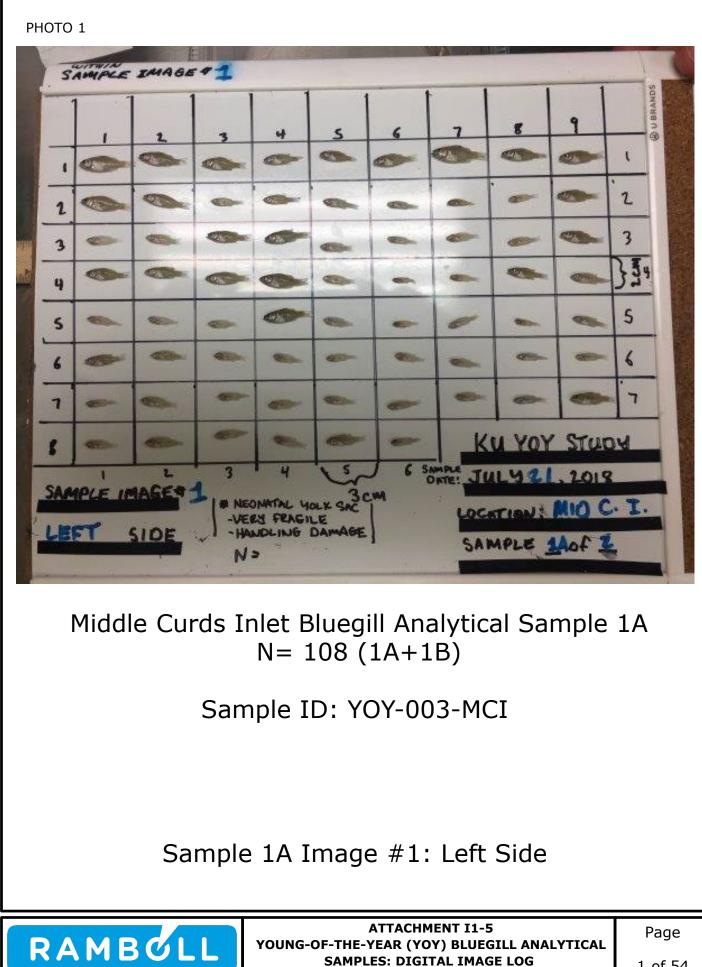
## ATTACHMENT I1-5 YOUNG-OF-THE-YEAR (YOY) BLUEGILL ANALYTICAL SAMPLES: DIGITAL IMAGE LOG

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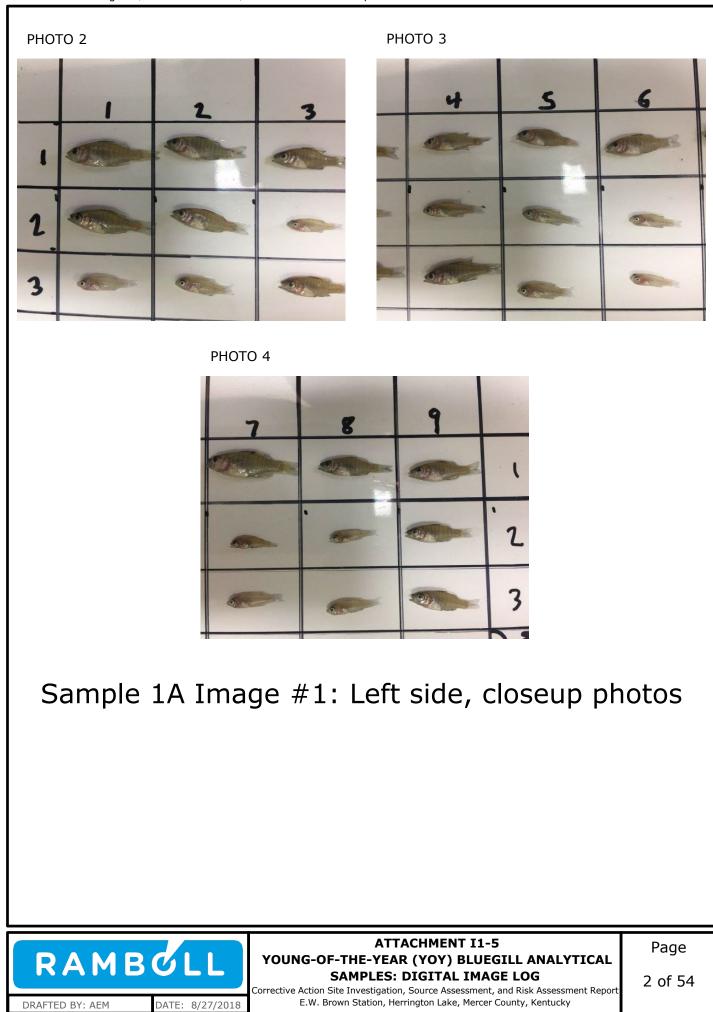
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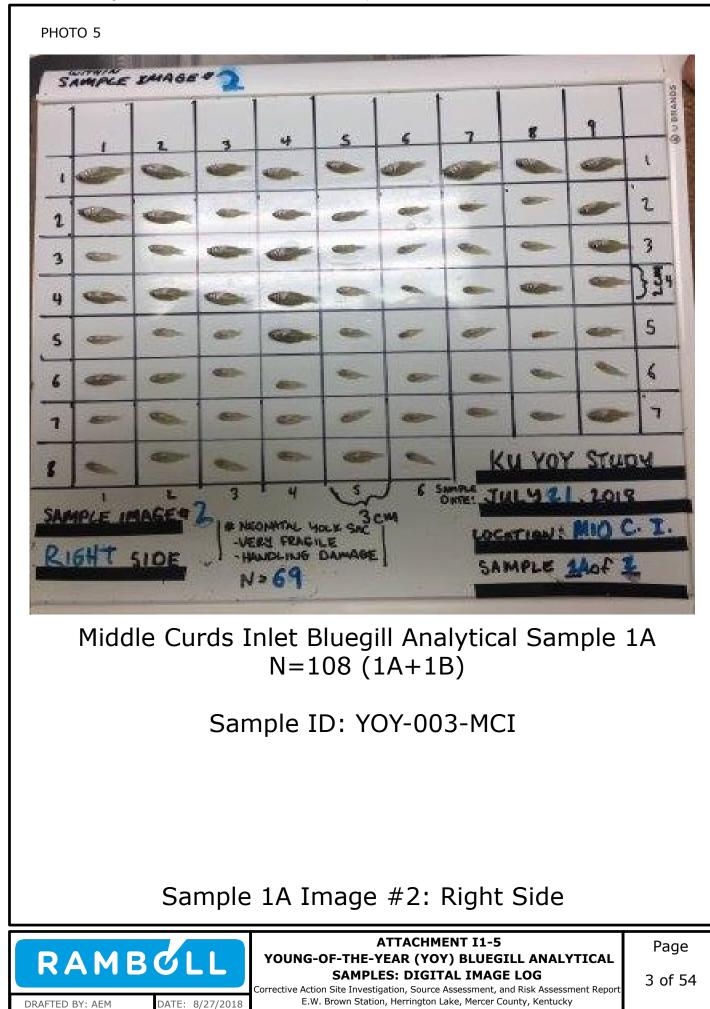
Corrective Action Site Investigation, Source Assessment, and Risk Assessment Report E.W. Brown Station, Herrington Lake, Mercer County, Kentucky

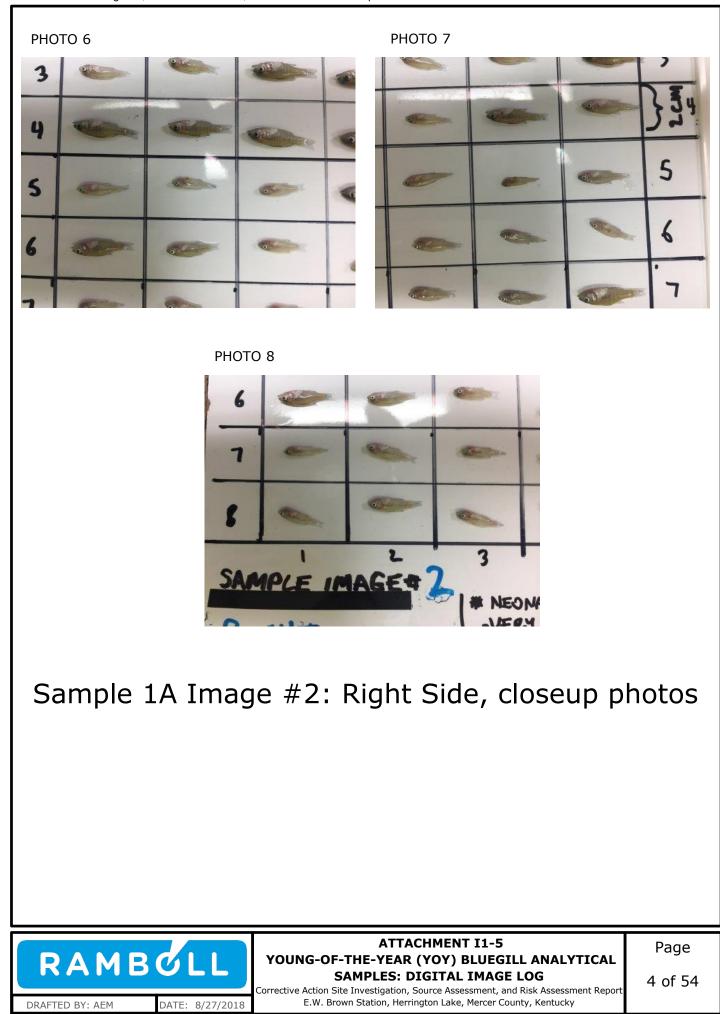


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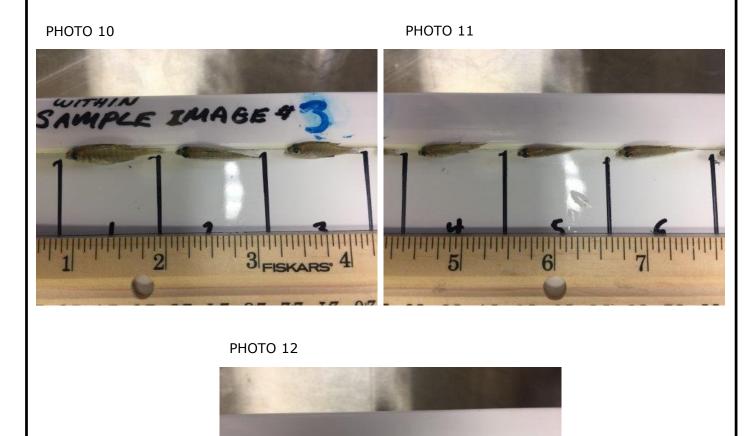


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ATTACHMENT I1-5PageYOUNG-OF-THE-YEAR (YOY) BLUEGILL ANALYTICAL SAMPLES: DIGITAL IMAGE LOG5 of 54Corrective Action Site Investigation, Source Assessment, and Risk Assessment Report5 of 54

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ATTACHMENT I1-5 YOUNG-OF-THE-YEAR (YOY) BLUEGILL ANALYTICAL SAMPLES: DIGITAL IMAGE LOG

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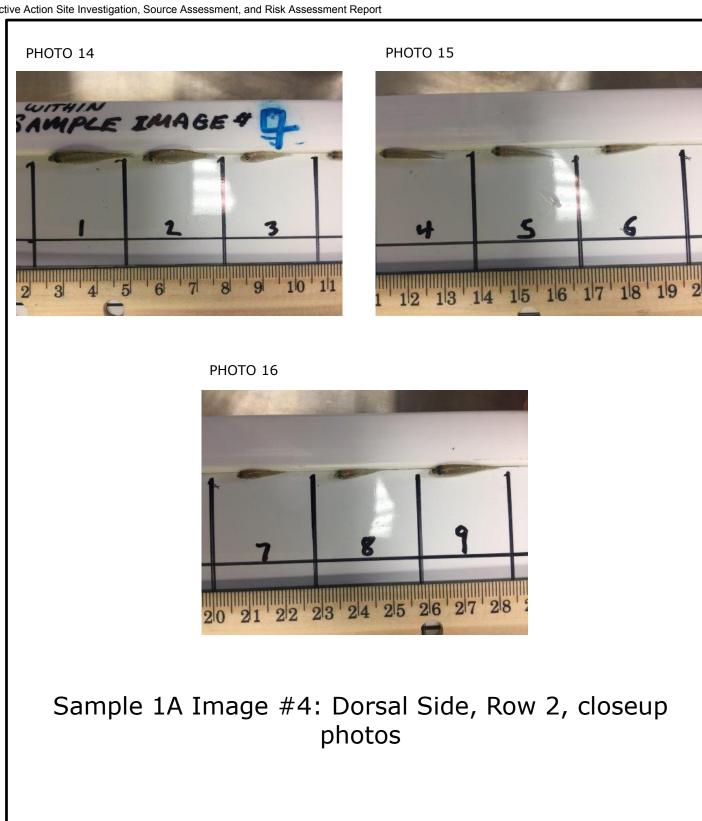
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Corrective Action Site Investigation, Source Assessment, and Risk Assessment Report E.W. Brown Station, Herrington Lake, Mercer County, Kentucky

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Corrective Action Site Investigation, Source Assessment, and Risk Assessment Report E.W. Brown Station, Herrington Lake, Mercer County, Kentucky





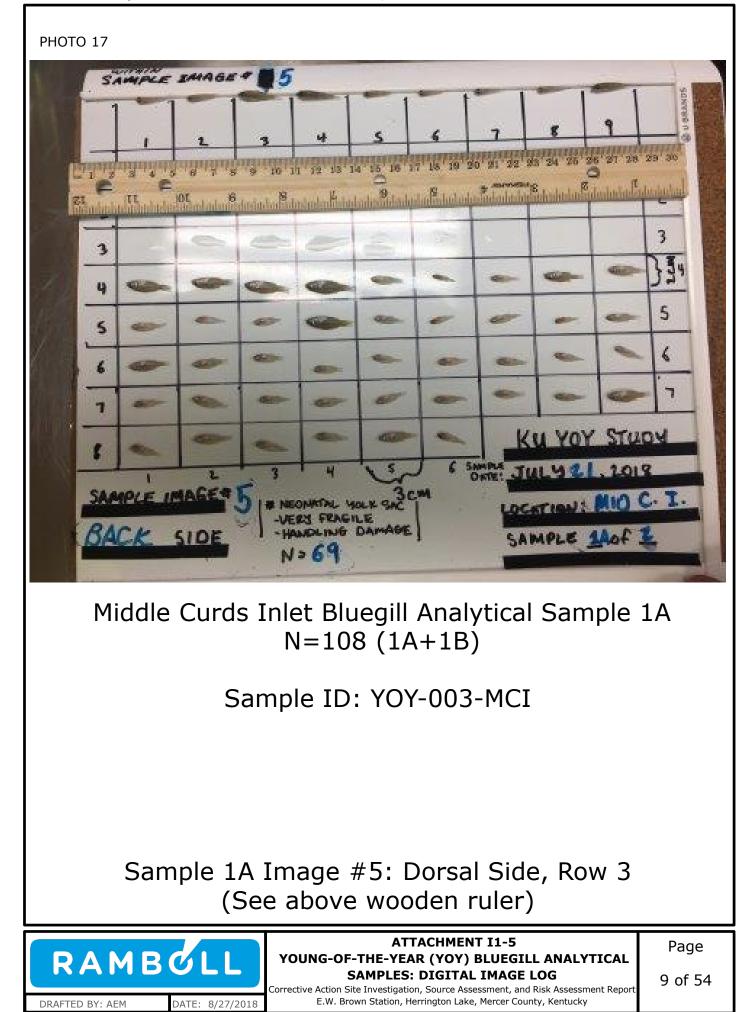
**ATTACHMENT I1-5** YOUNG-OF-THE-YEAR (YOY) BLUEGILL ANALYTICAL SAMPLES: DIGITAL IMAGE LOG Corrective Action Site Investigation, Source Assessment, and Risk Assessment Report

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E.W. Brown Station, Herrington Lake, Mercer County, Kentucky

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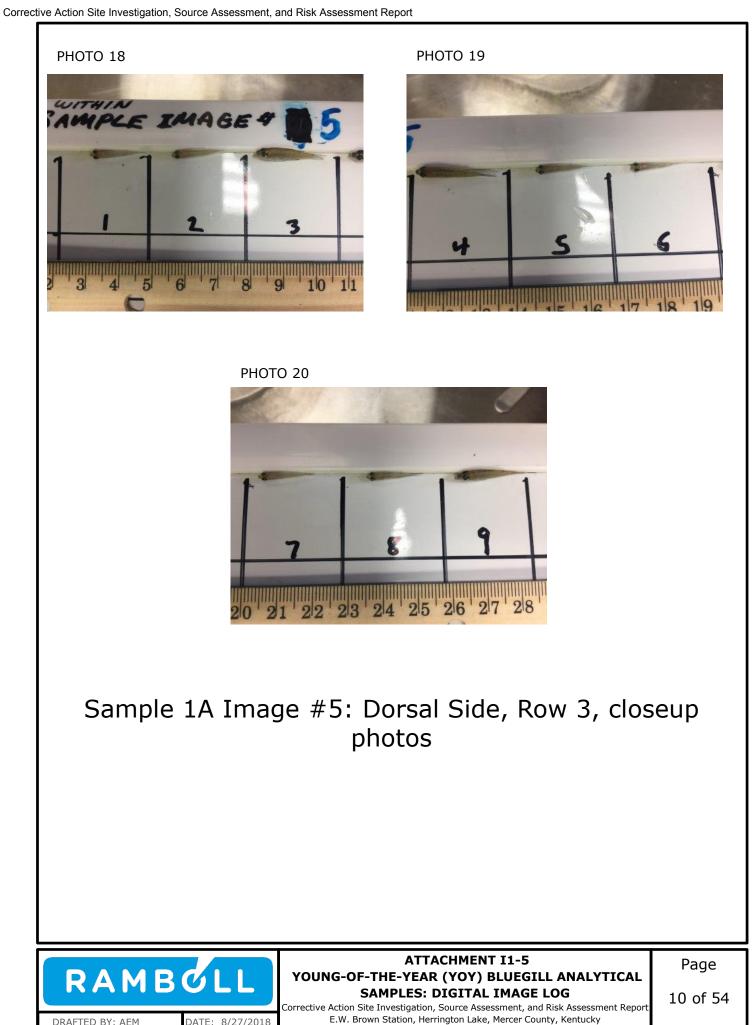
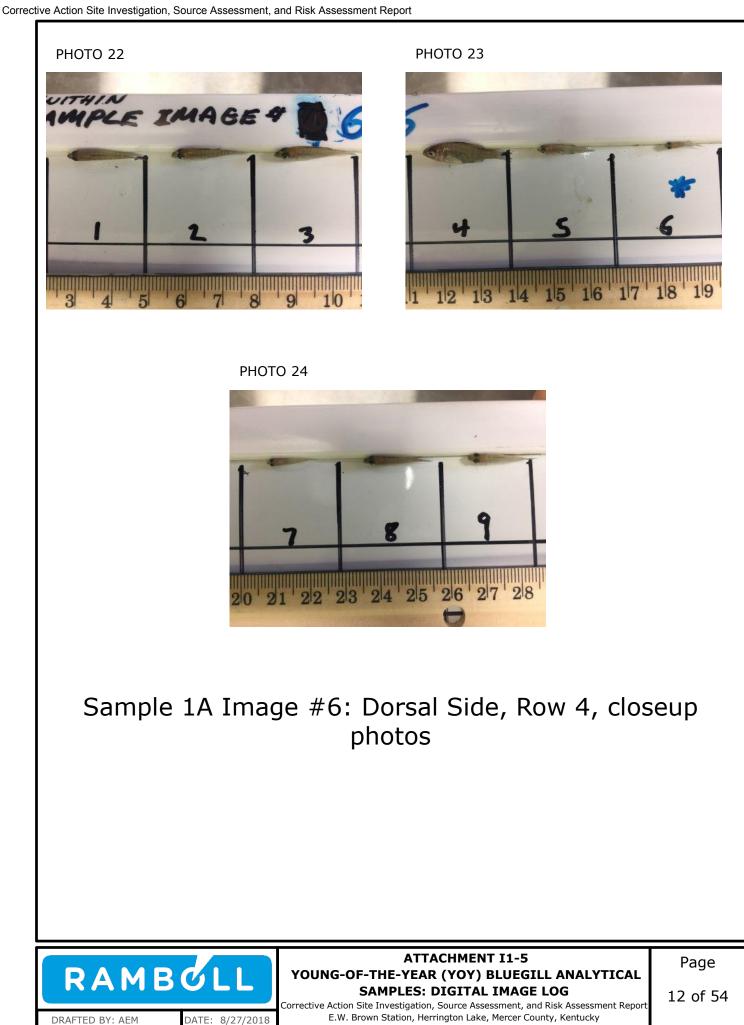


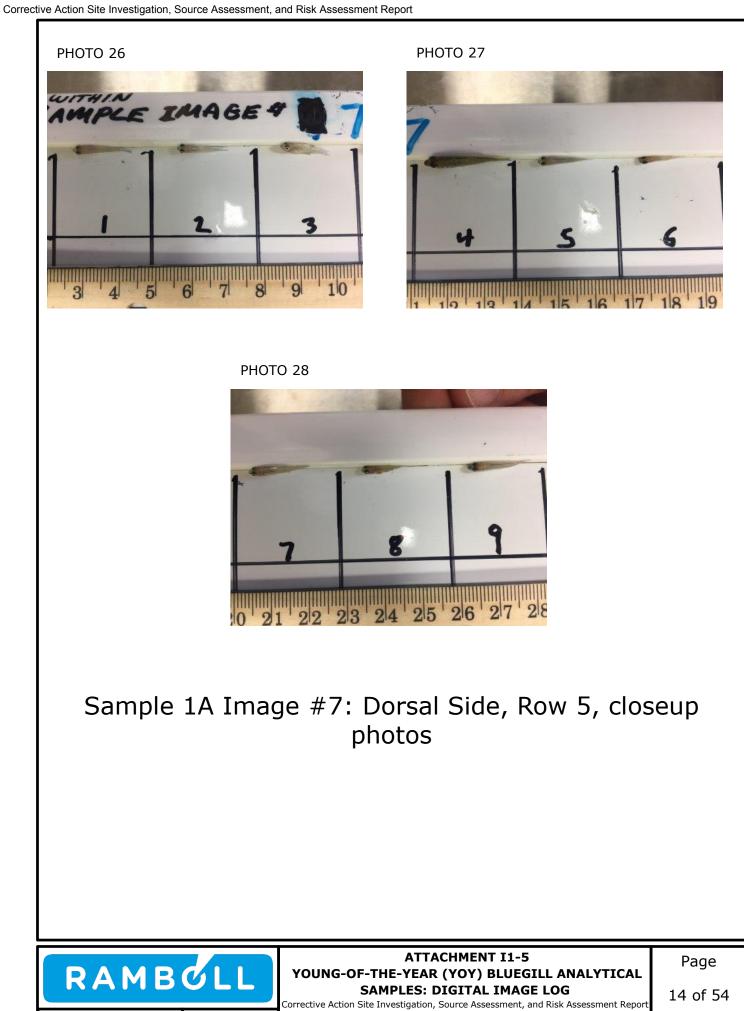
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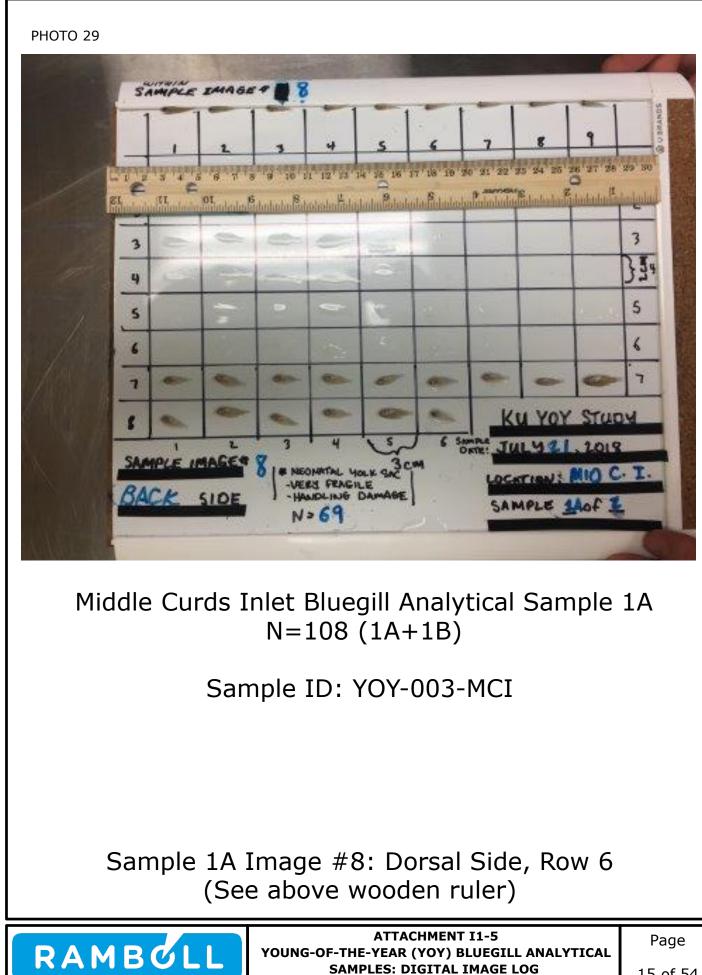
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Corrective Action Site Investigation, Source Assessment, and Risk Assessment Report E.W. Brown Station, Herrington Lake, Mercer County, Kentucky



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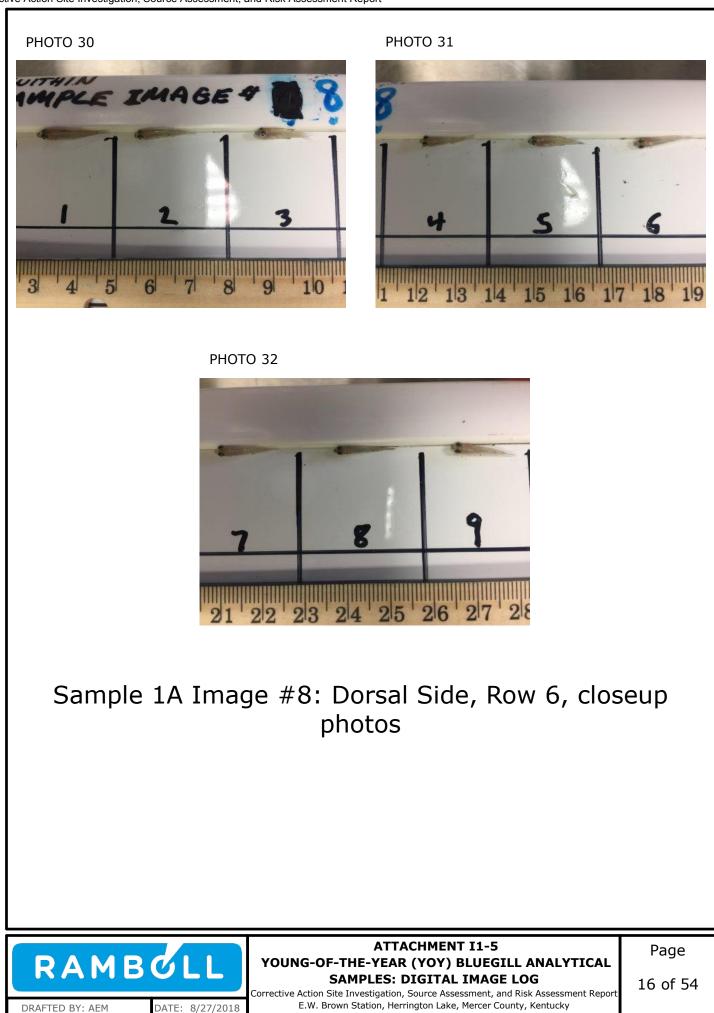
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Corrective Action Site Investigation, Source Assessment, and Risk Assessment Report E.W. Brown Station, Herrington Lake, Mercer County, Kentucky



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E.W. Brown Station, Herrington Lake, Mercer County, Kentucky

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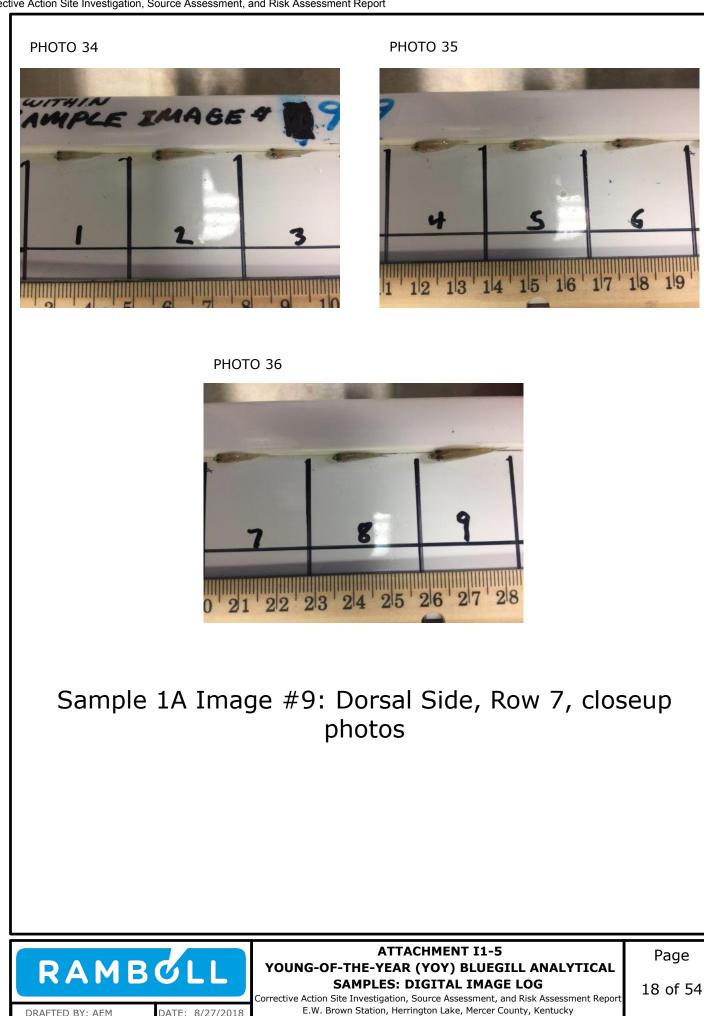
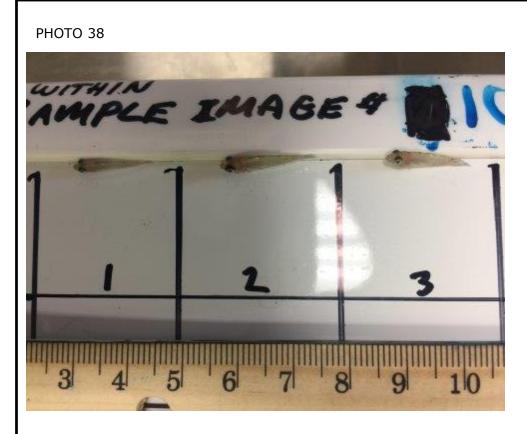
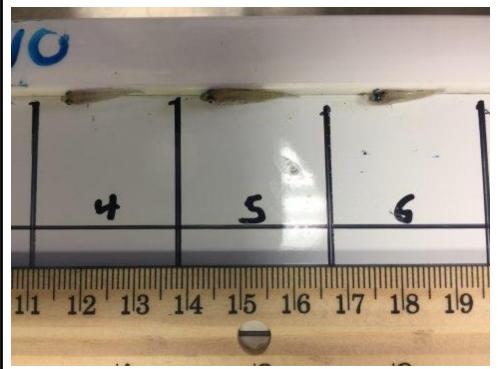


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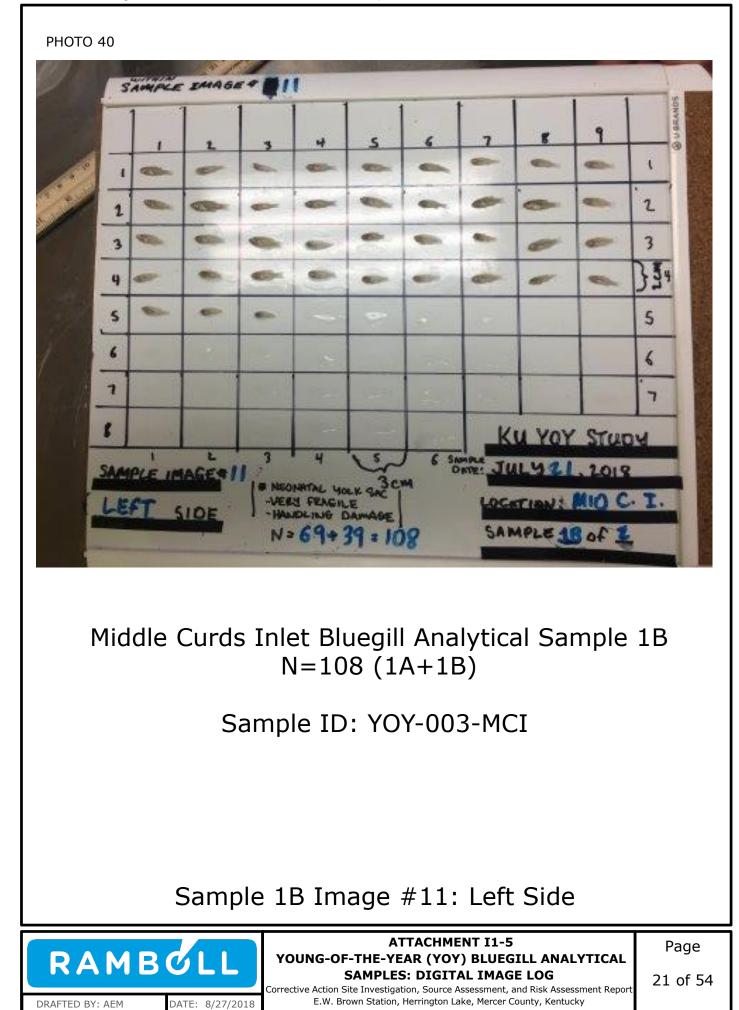
Sample 1A Image #10: Dorsal Side, Row 8, closeup photos



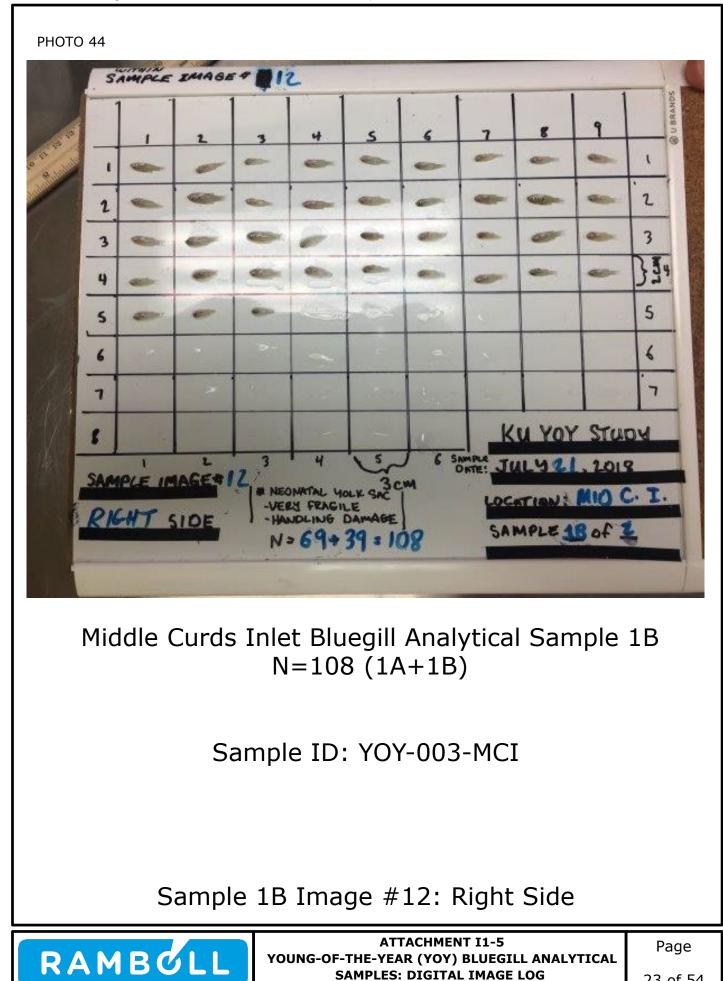
ATTACHMENT I1-5 YOUNG-OF-THE-YEAR (YOY) BLUEGILL ANALYTICAL SAMPLES: DIGITAL IMAGE LOG Corrective Action Site Investigation, Source Assessment, and Risk Assessment Report

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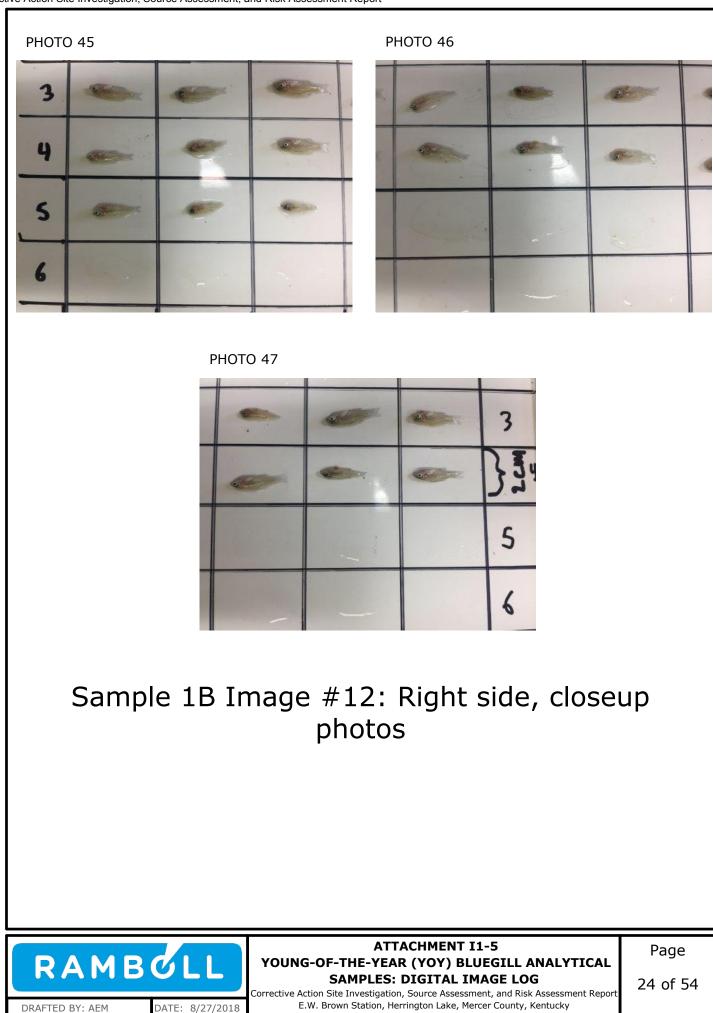






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Corrective Action Site Investigation, Source Assessment, and Risk Assessment Report E.W. Brown Station, Herrington Lake, Mercer County, Kentucky



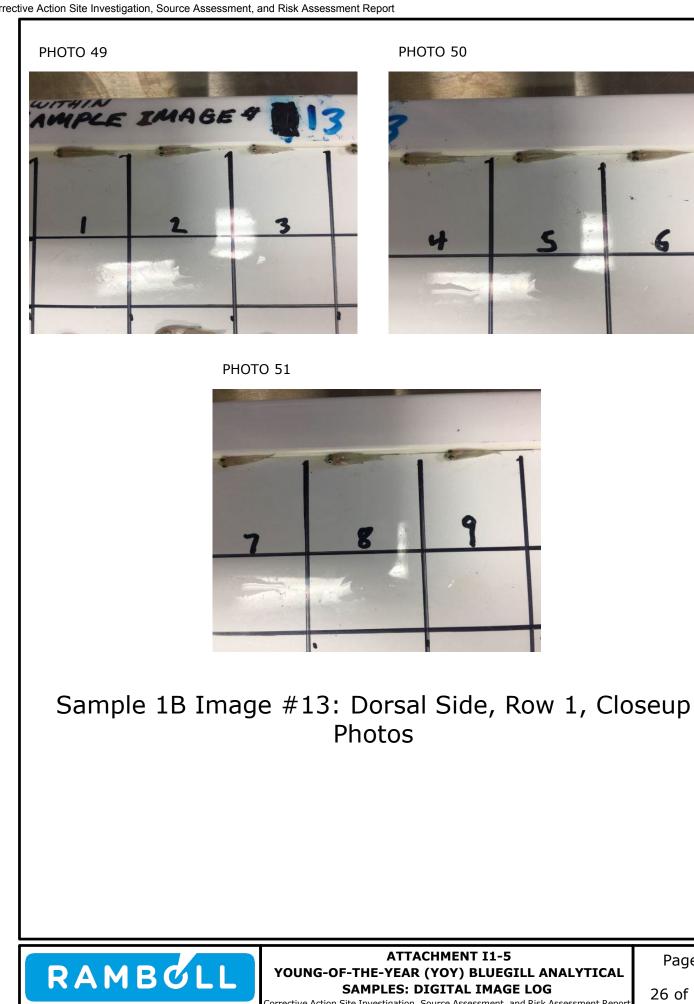
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E.W. Brown Station, Herrington Lake, Mercer County, Kentucky

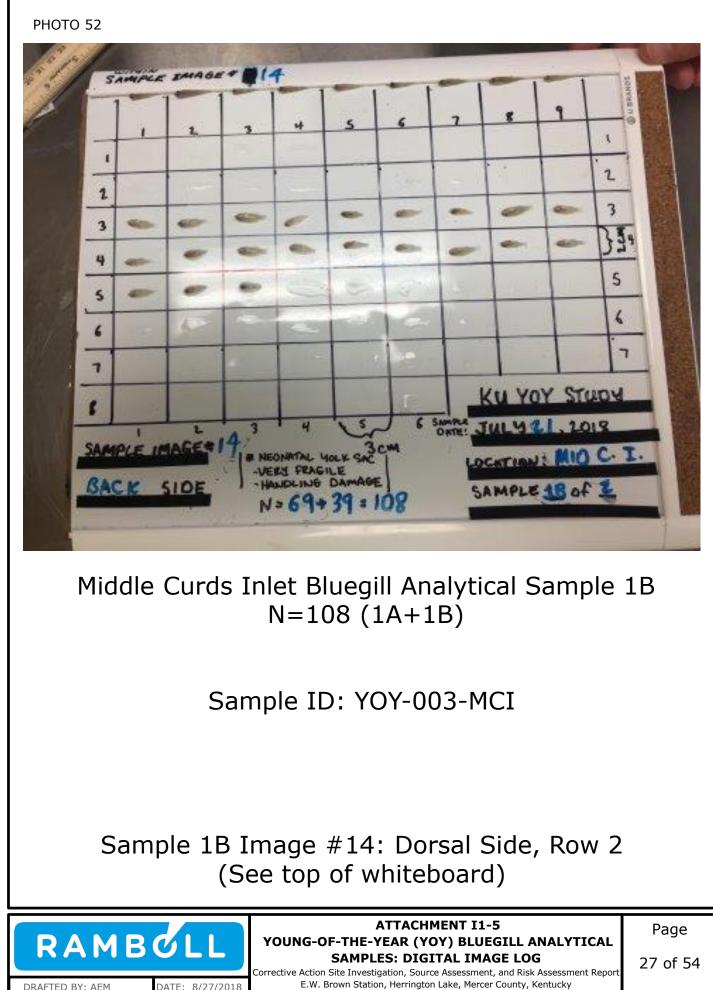


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Corrective Action Site Investigation, Source Assessment, and Risk Assessment Report E.W. Brown Station, Herrington Lake, Mercer County, Kentucky

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РНОТО 55



**PHOTO 54** 

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Sample 1B Image #14: Dorsal Side, Row 2, Closeup Photos

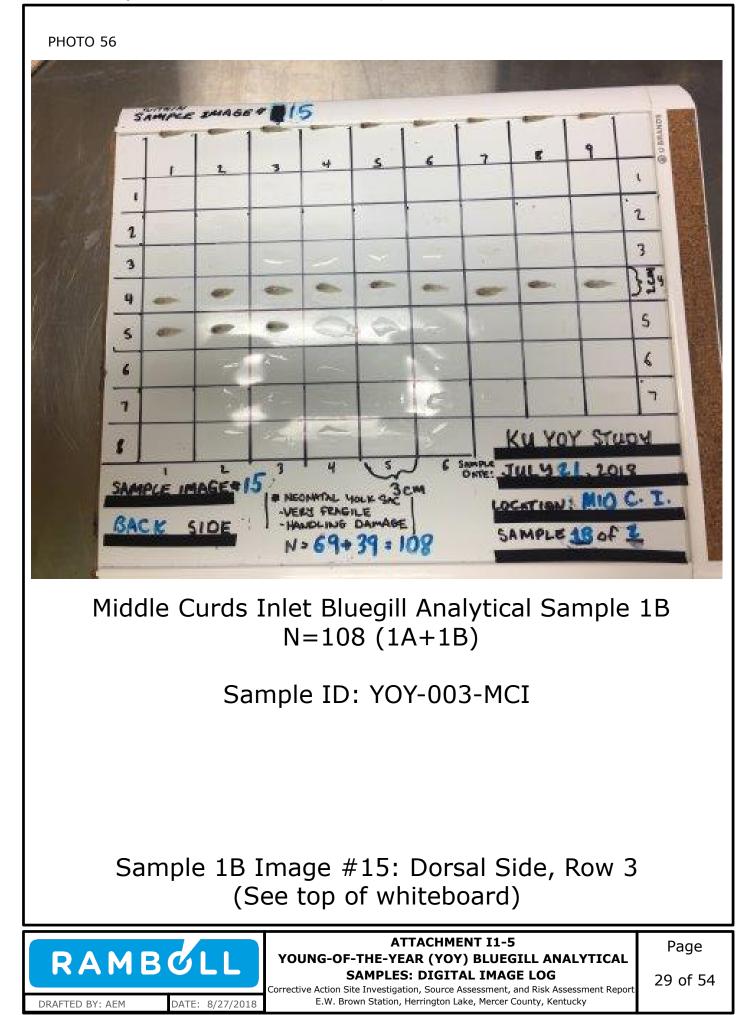


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ATTACHMENT I1-5 YOUNG-OF-THE-YEAR (YOY) BLUEGILL ANALYTICAL SAMPLES: DIGITAL IMAGE LOG Corrective Action Site Investigation, Source Assessment, and Risk Assessment Report

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## Sample 1B Image #15: Dorsal Side, Row 3, Closeup Photos



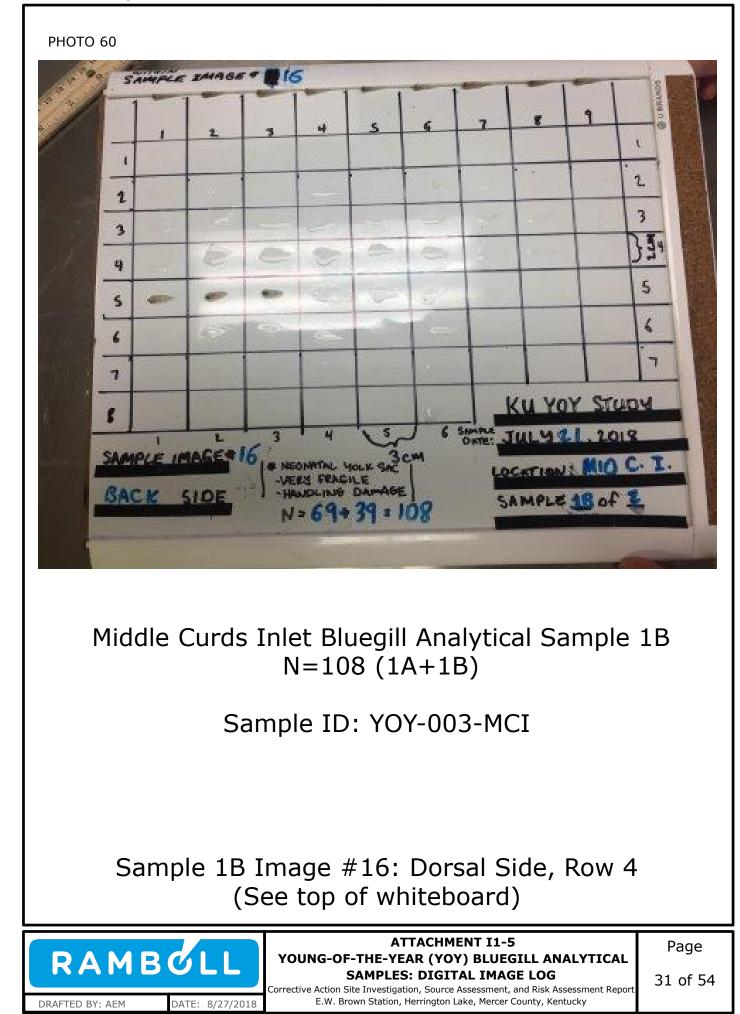
ATTACHMENT I1-5 YOUNG-OF-THE-YEAR (YOY) BLUEGILL ANALYTICAL SAMPLES: DIGITAL IMAGE LOG Corrective Action Site Investigation, Source Assessment, and Risk Assessment Report

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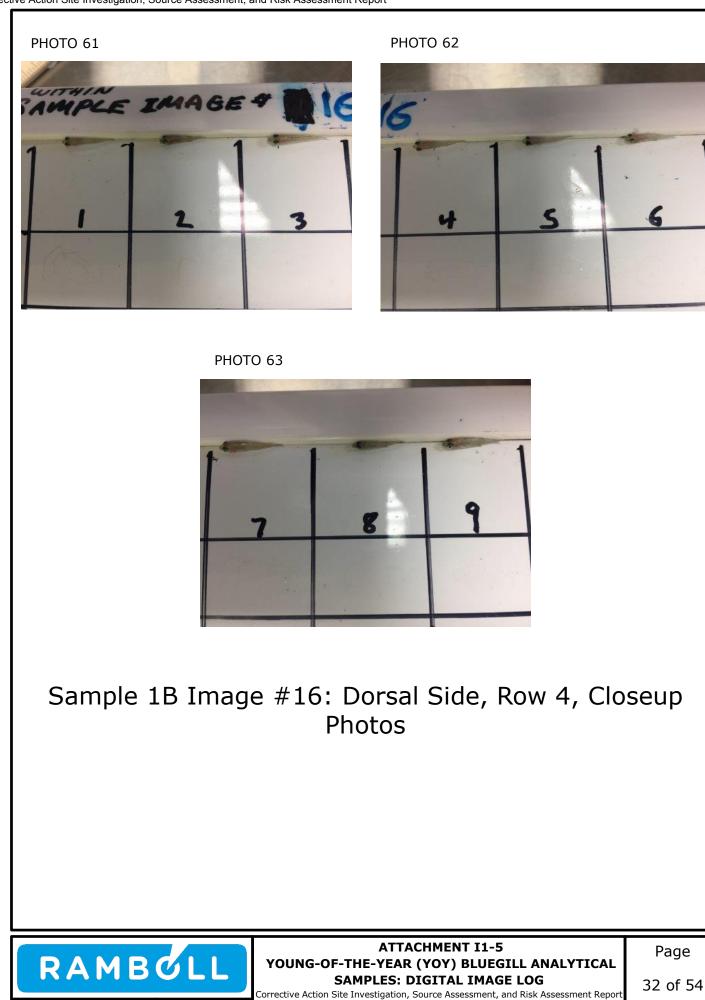
30 of 54

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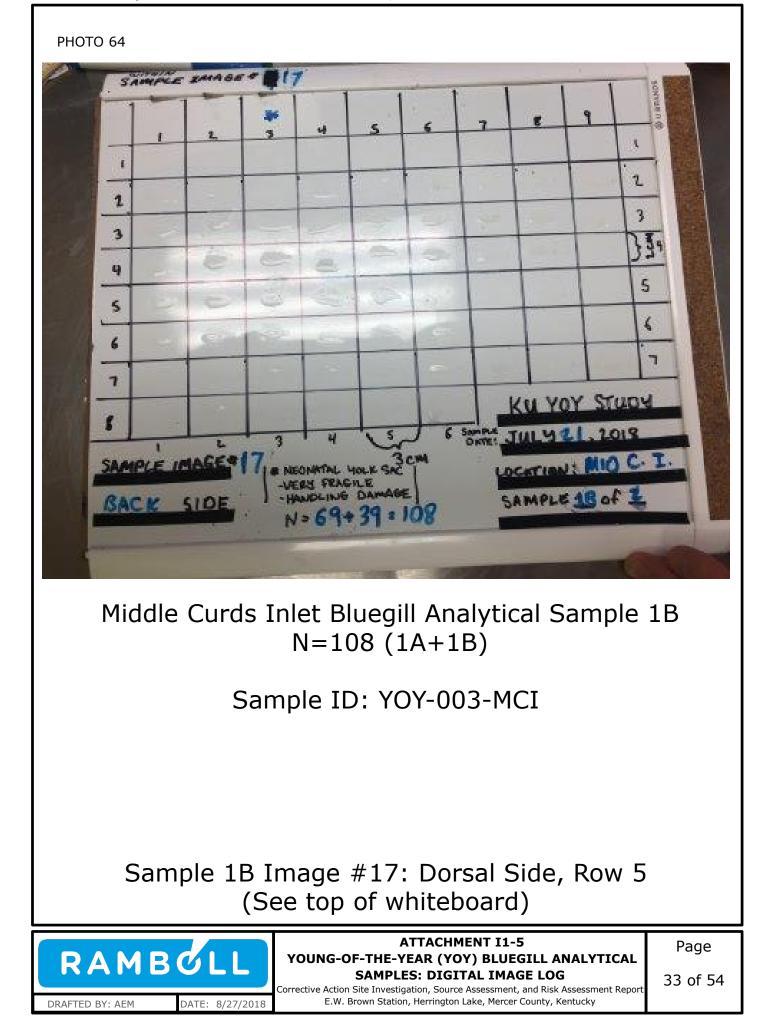


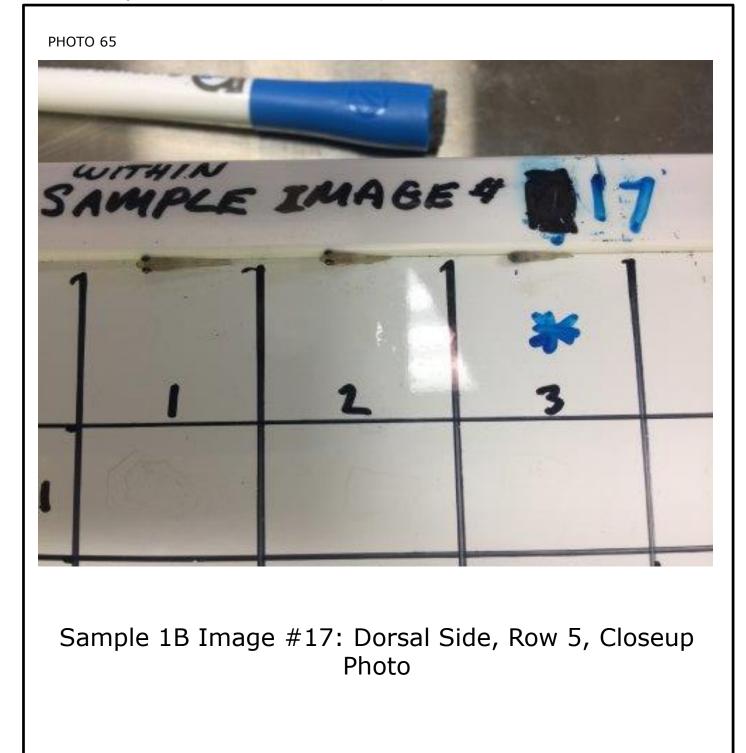
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E.W. Brown Station, Herrington Lake, Mercer County, Kentucky





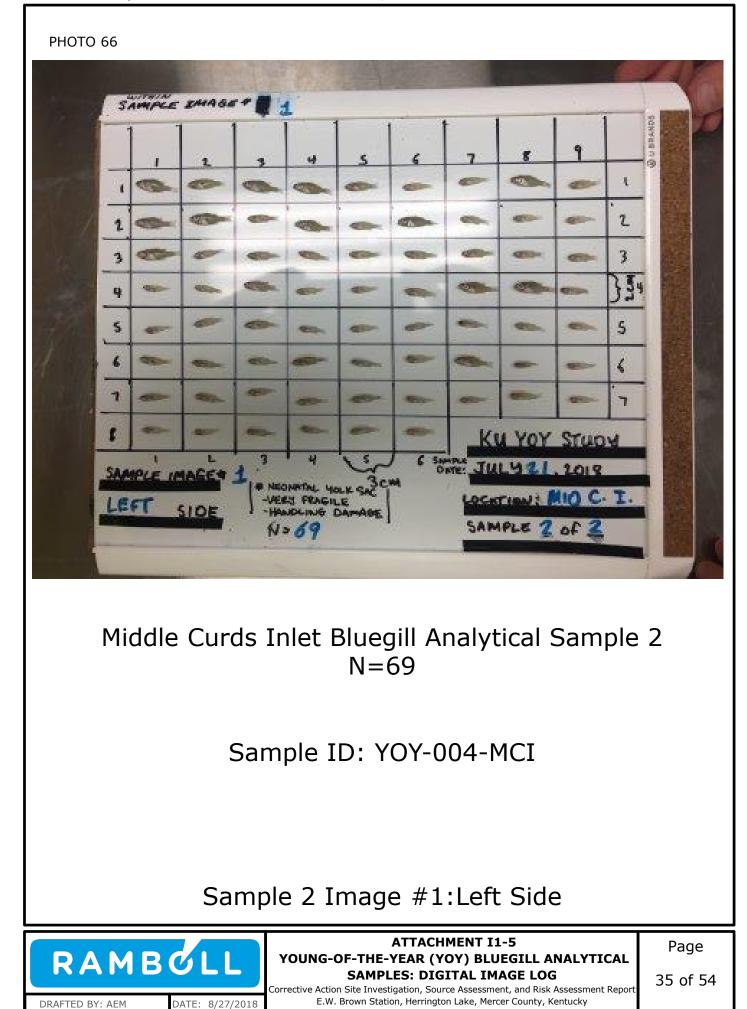


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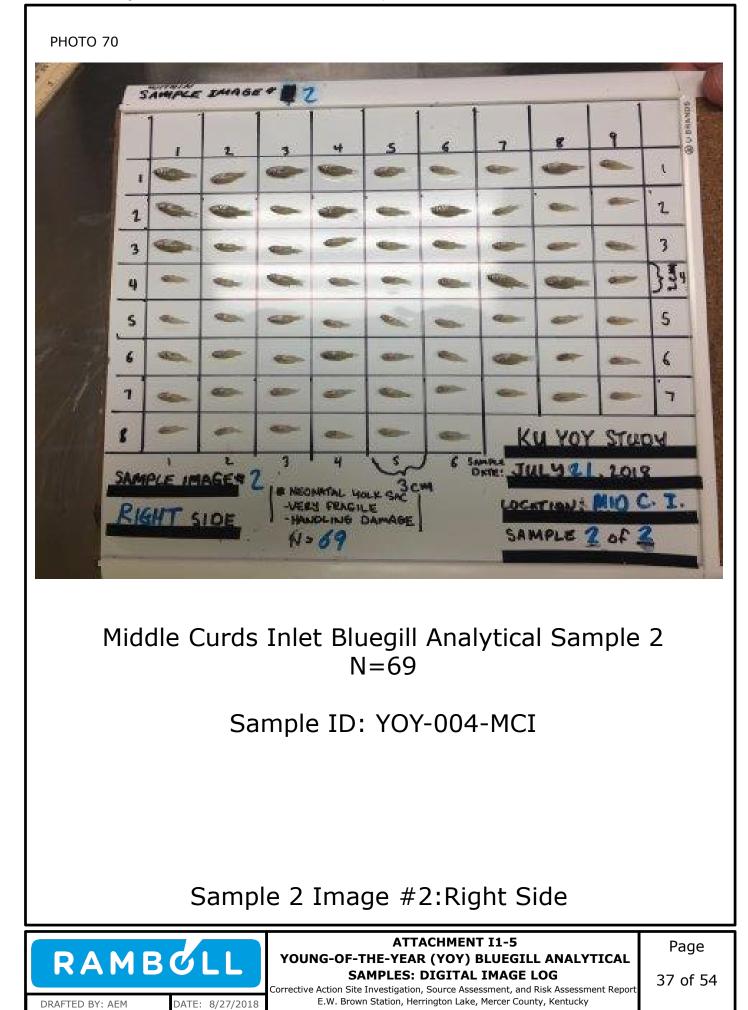
ATTACHMENT I1-5 YOUNG-OF-THE-YEAR (YOY) BLUEGILL ANALYTICAL SAMPLES: DIGITAL IMAGE LOG Corrective Action Site Investigation, Source Assessment, and Risk Assessment Report

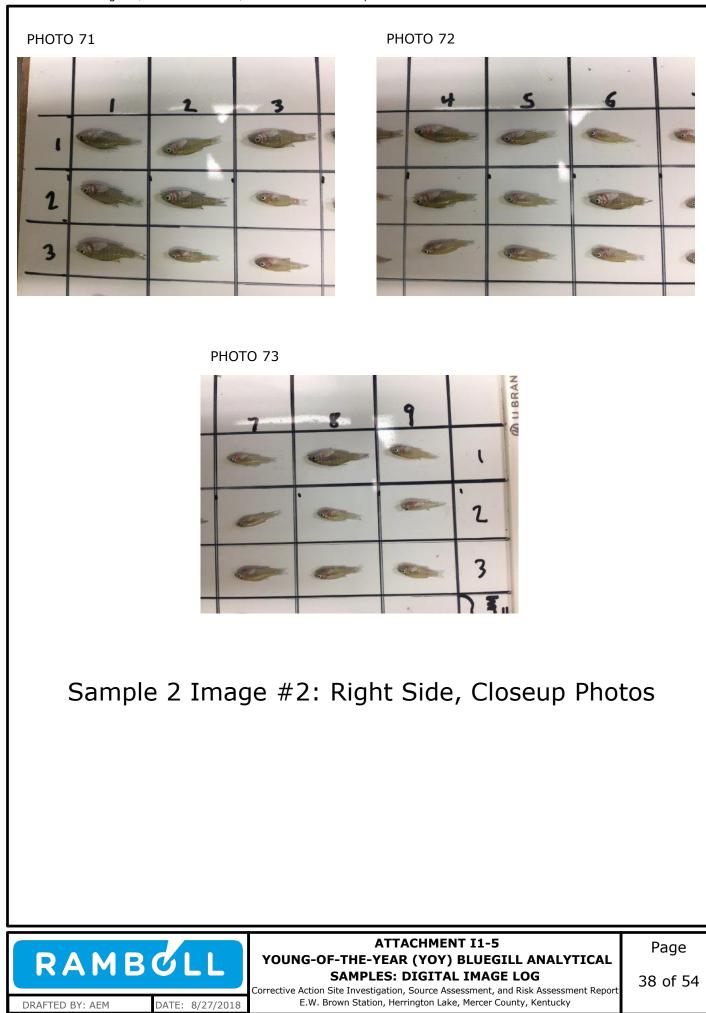
E.W. Brown Station, Herrington Lake, Mercer County, Kentucky

Page







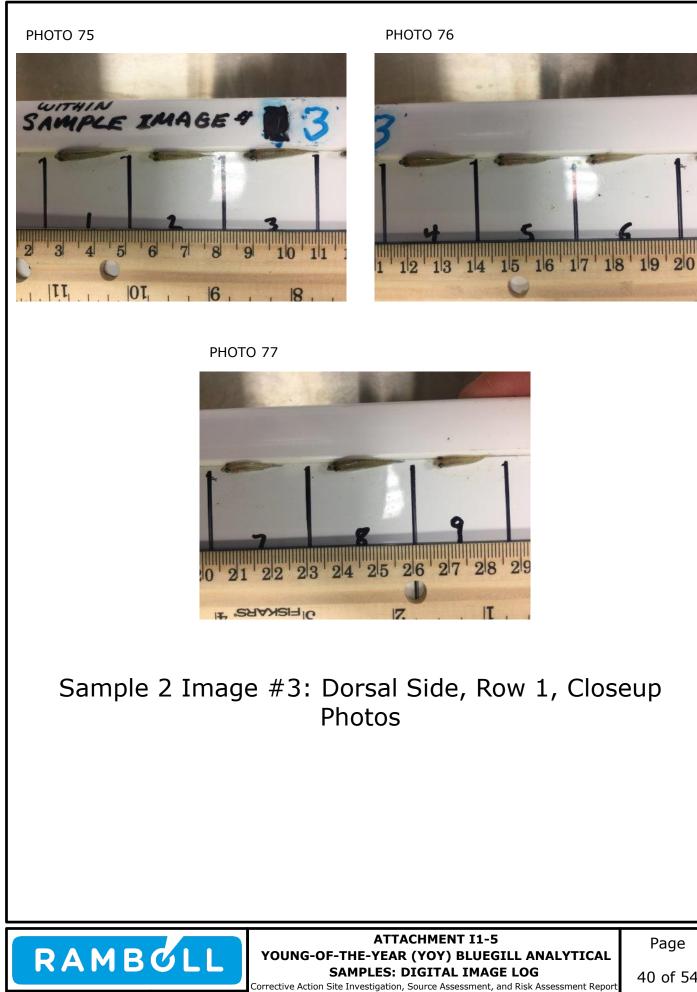


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DATE: 8/27/2018

PHOTO 74									
Middle Curds Inlet Bluegill Analytical Sample 2 N=69 Sample ID: YOY-004-MCI									
Sample 2 Image #3:Dorsal Side, Row 1 (See Above Wooden Ruler) ATTACHMENT I1-5 YOUNG-OF-THE-YEAR (YOY) BLUEGILL ANALYTICAL SAMPLES: DIGITAL IMAGE LOG	Page								

E.W. Brown Station, Herrington Lake, Mercer County, Kentucky

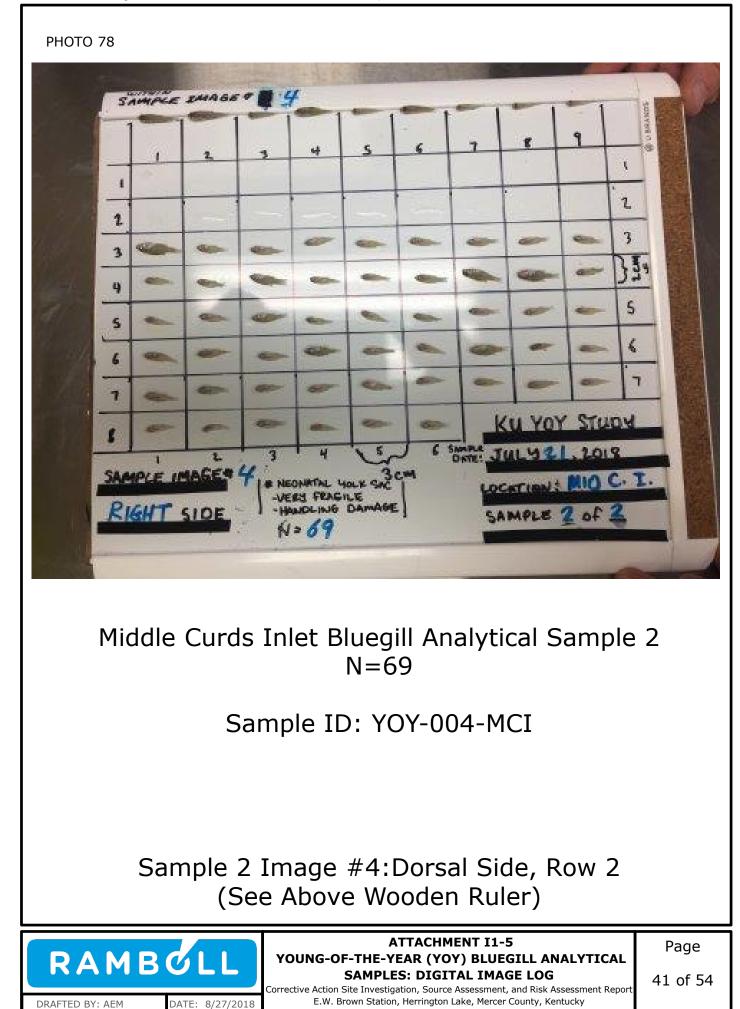


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E.W. Brown Station, Herrington Lake, Mercer County, Kentucky

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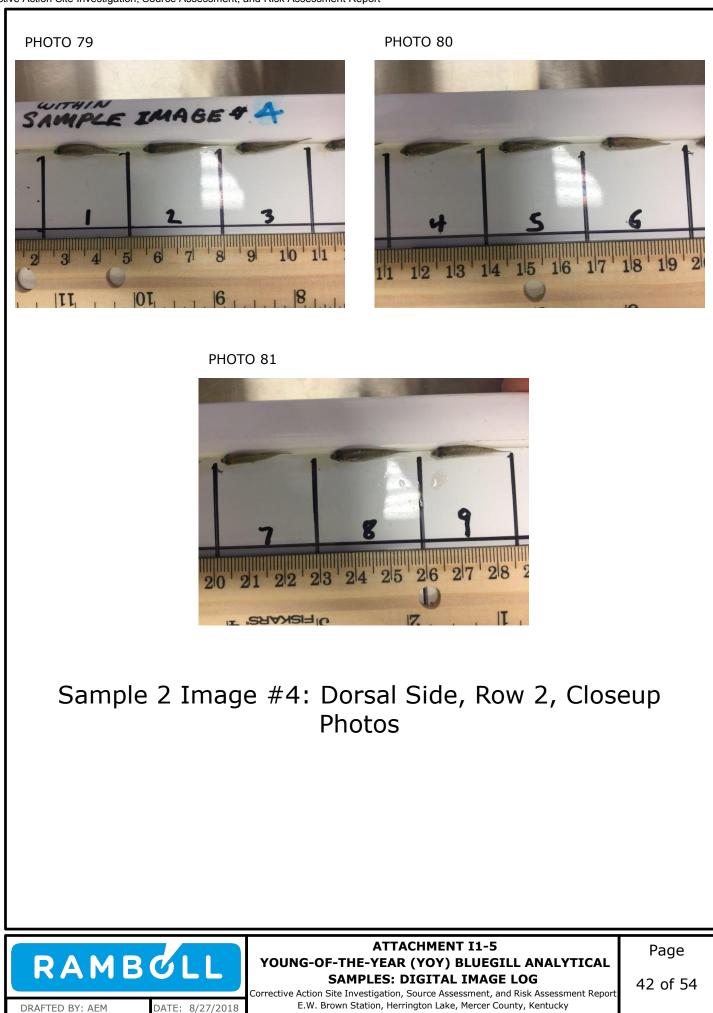
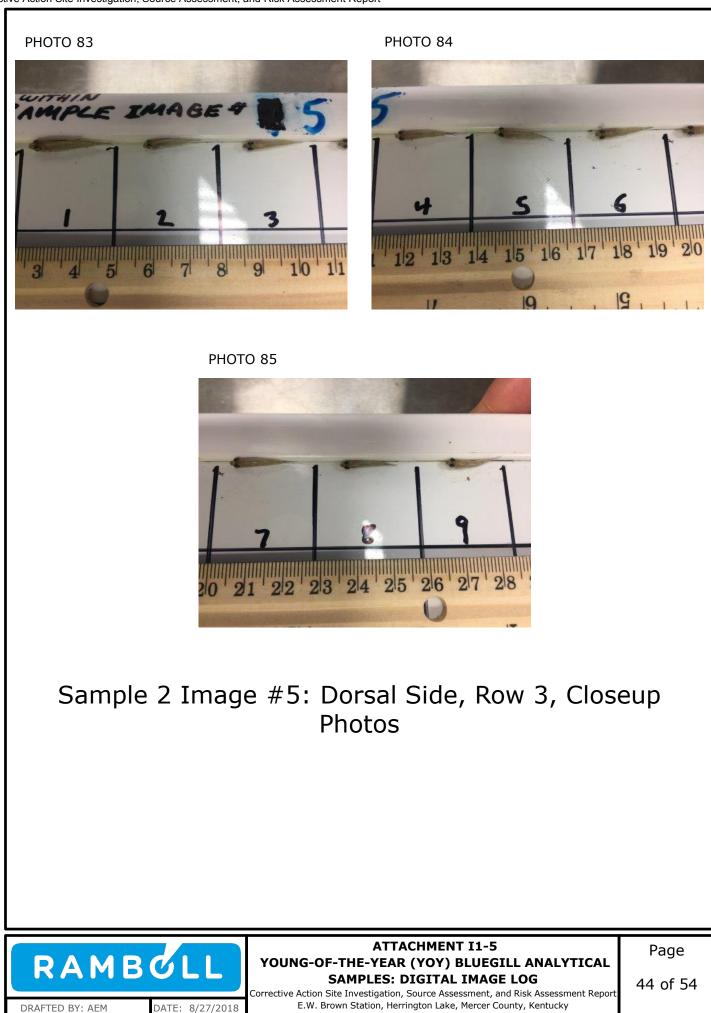
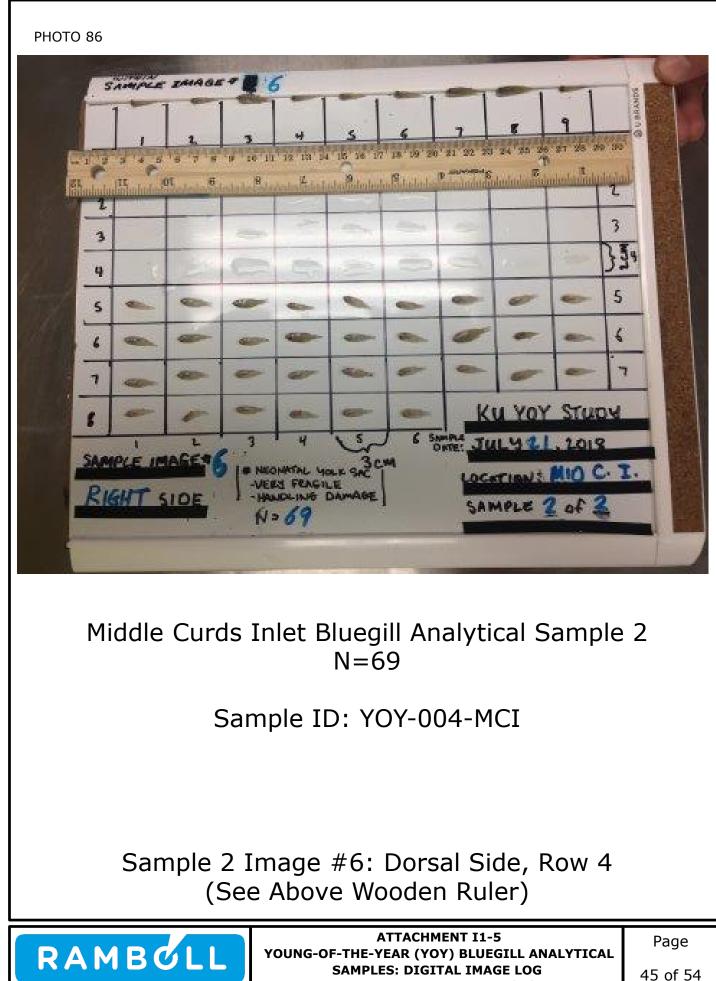


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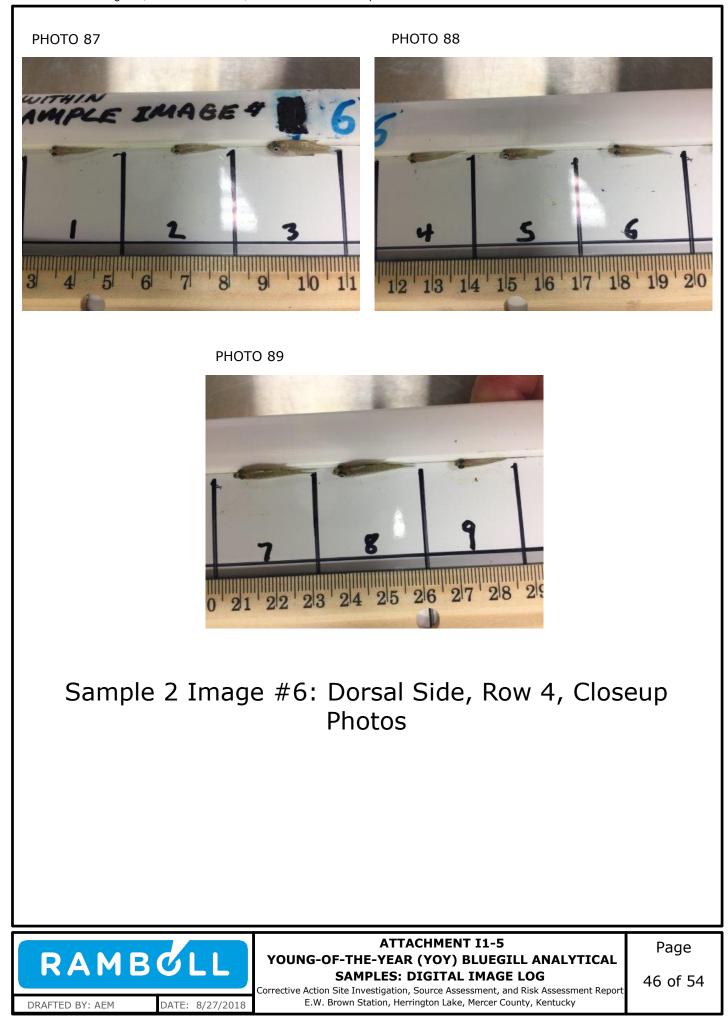


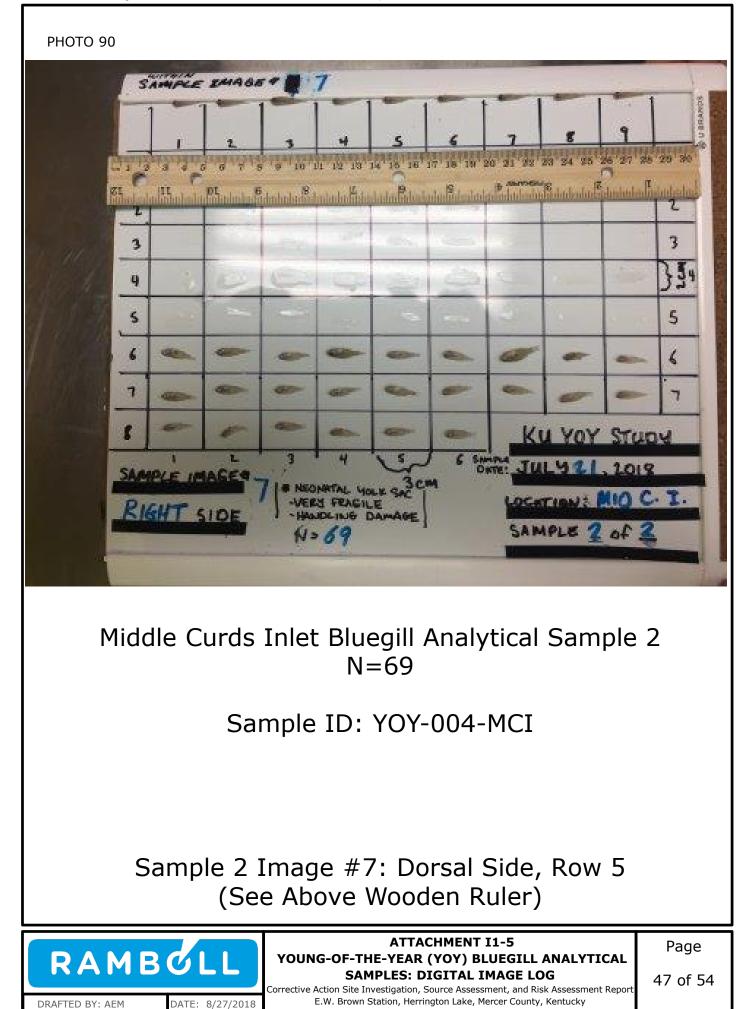


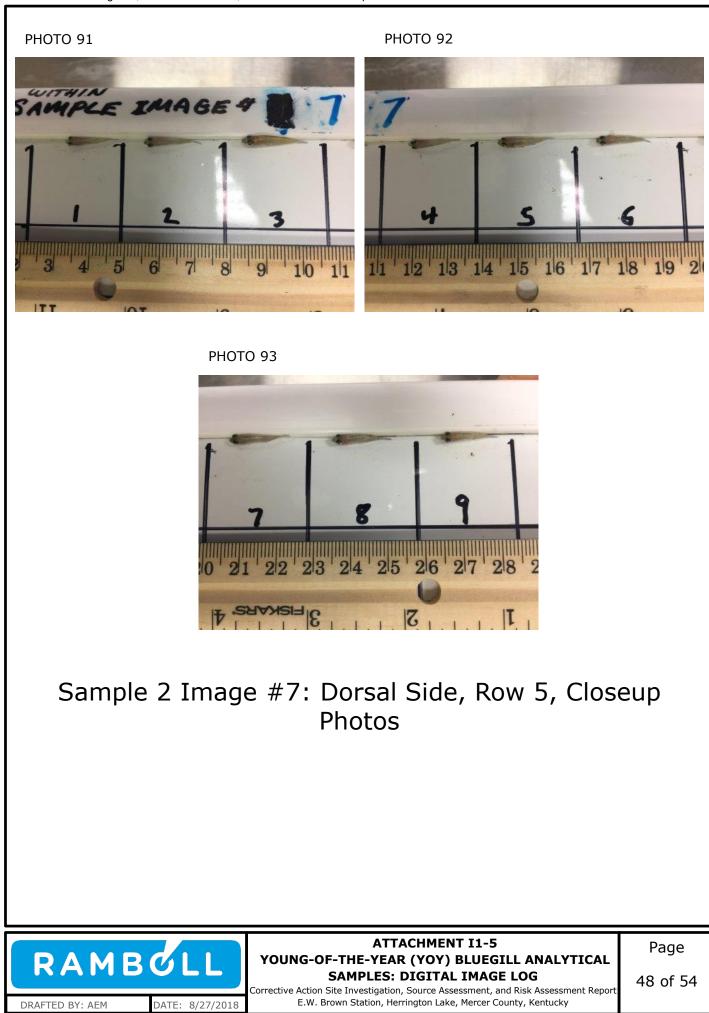
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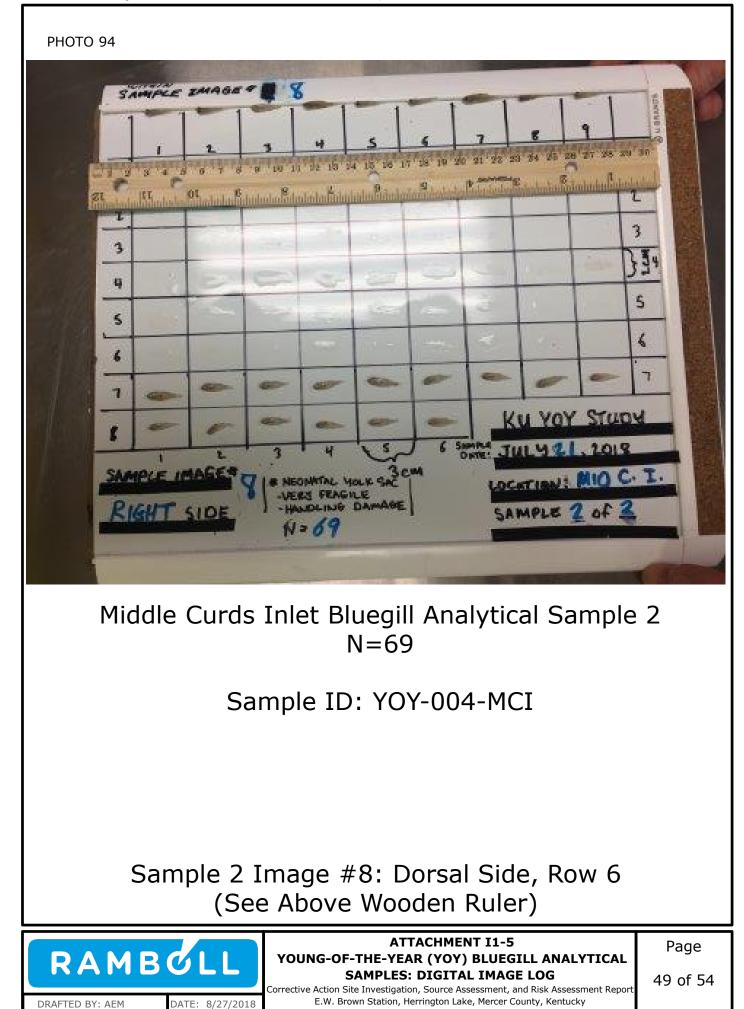
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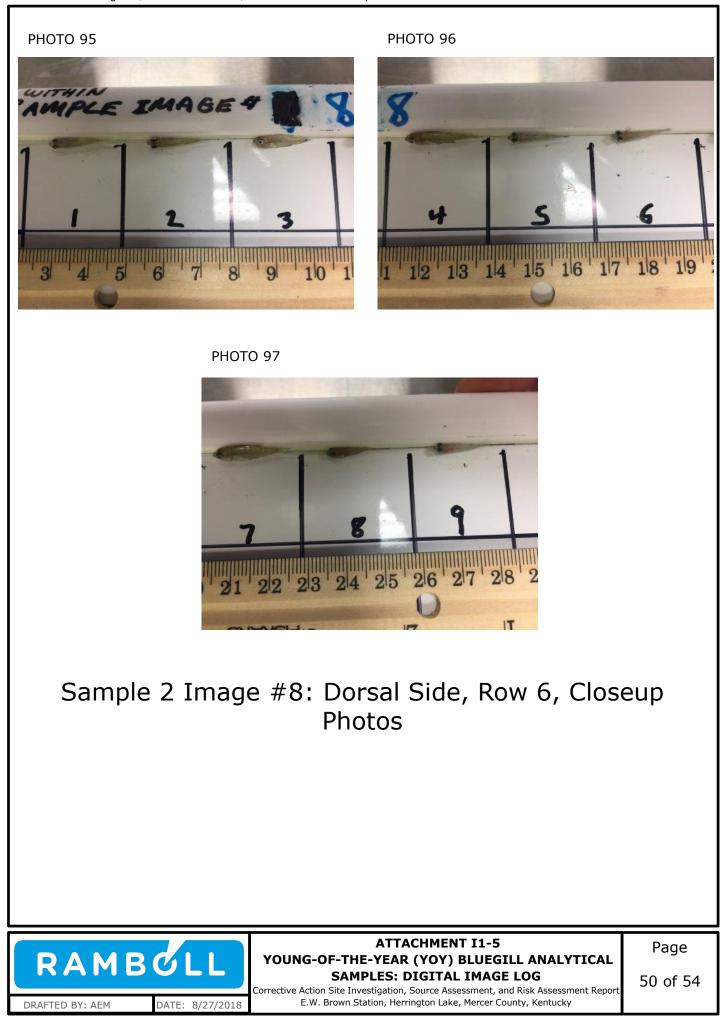
Corrective Action Site Investigation, Source Assessment, and Risk Assessment Report E.W. Brown Station, Herrington Lake, Mercer County, Kentucky

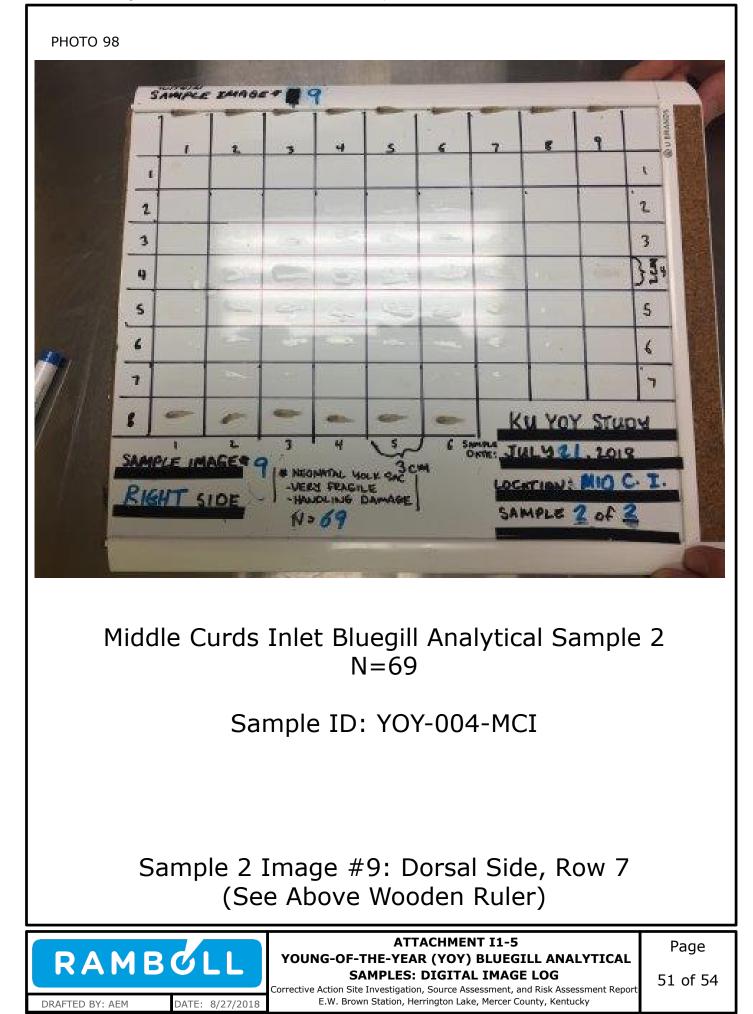


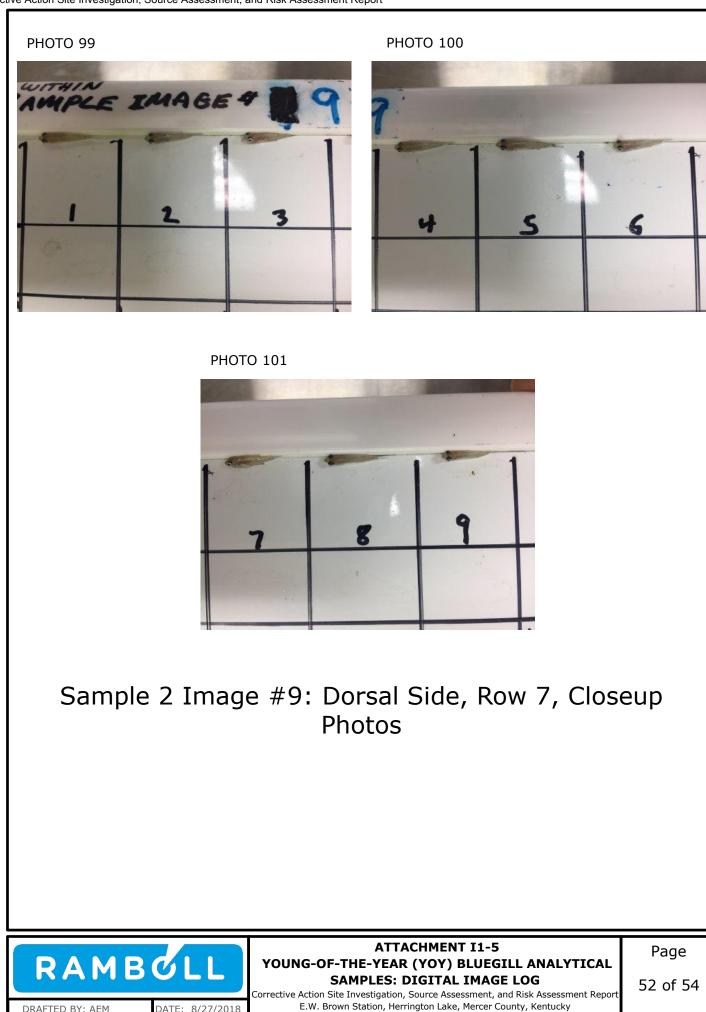






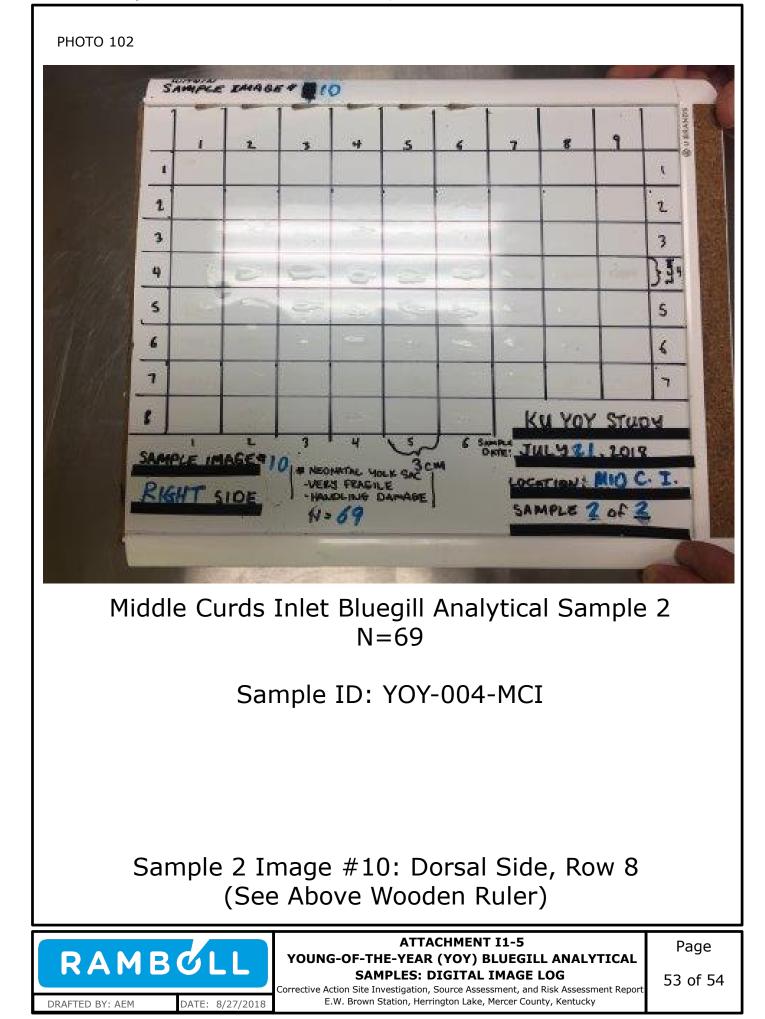






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DATE: 8/27/2018





**PHOTO 104** 



Sample 2 Image #10: Dorsal Side, Row 8, Closeup Photos



ATTACHMENT I1-5 YOUNG-OF-THE-YEAR (YOY) BLUEGILL ANALYTICAL SAMPLES: DIGITAL IMAGE LOG Corrective Action Site Investigation, Source Assessment, and Risk Assessment Report

E.W. Brown Station, Herrington Lake, Mercer County, Kentucky

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## **LOWER CURDS INLET**



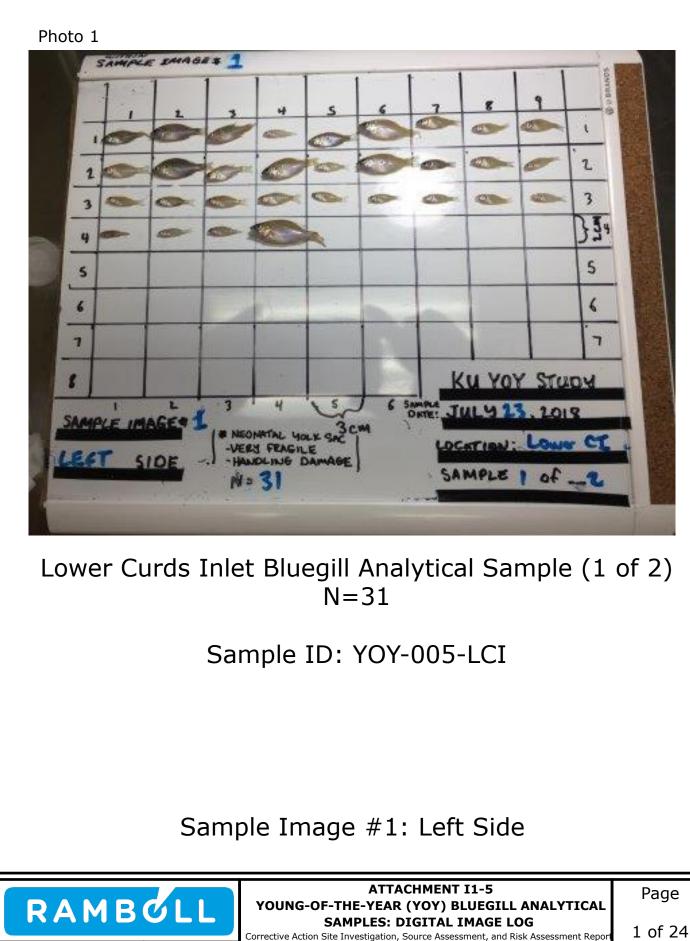
## ATTACHMENT I1-5 YOUNG-OF-THE-YEAR (YOY) BLUEGILL ANALYTICAL SAMPLES: DIGITAL IMAGE LOG

Page

Corrective Action Site Investigation, Source Assessment, and Risk Assessment Report E.W. Brown Station, Herrington Lake, Mercer County, Kentucky

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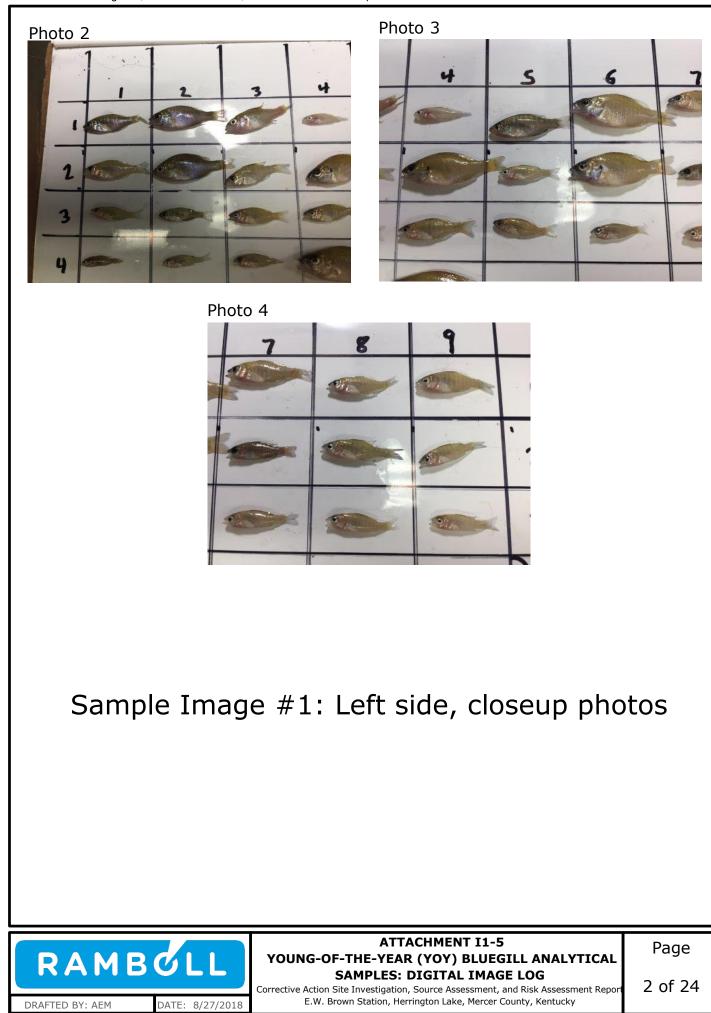
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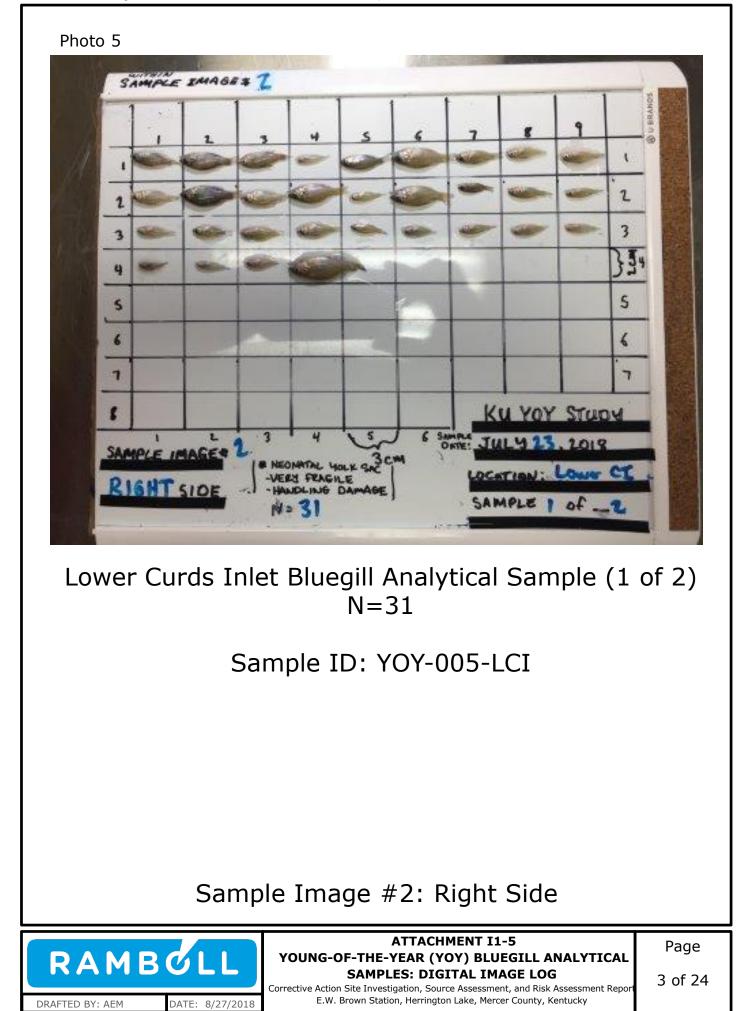


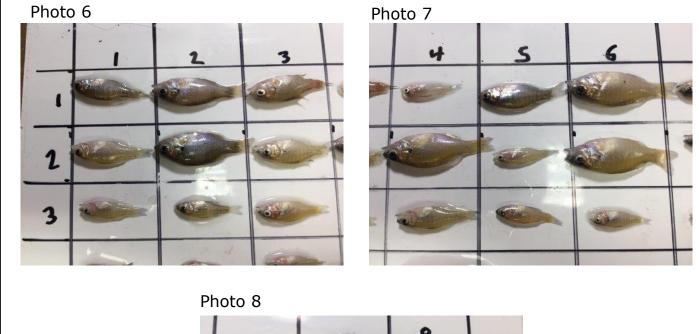
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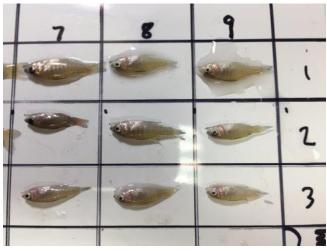
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tive Action Site Investigation, Source Assessment, and Risk Assessn E.W. Brown Station, Herrington Lake, Mercer County, Kentucky









Sample Image #2: Right side, closeup photos



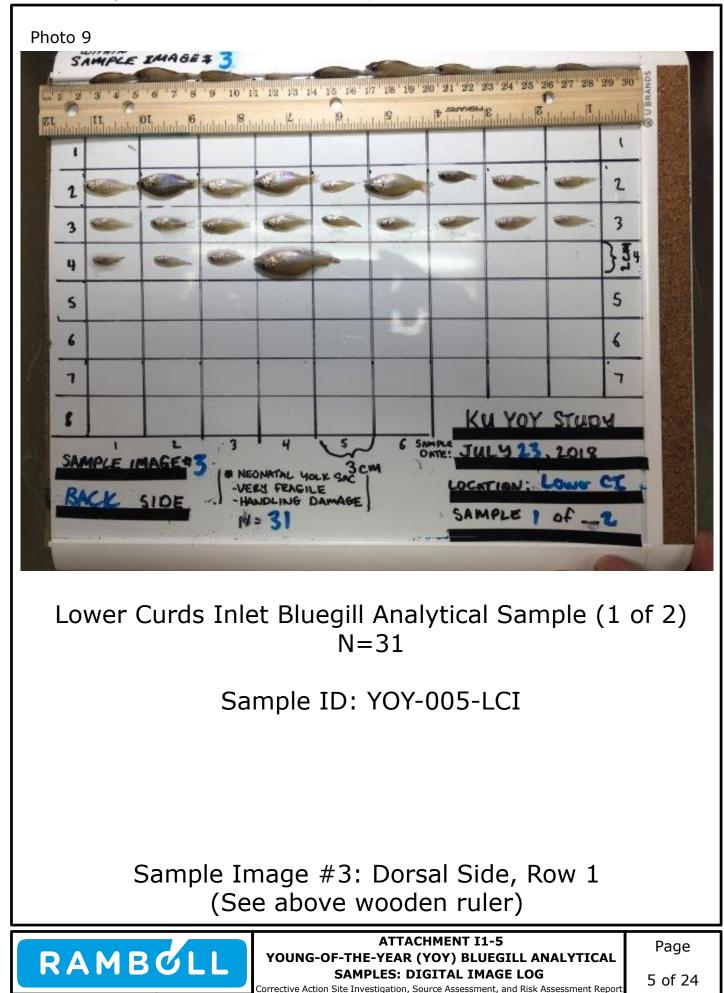
ATTACHMENT I1-5 YOUNG-OF-THE-YEAR (YOY) BLUEGILL ANALYTICAL SAMPLES: DIGITAL IMAGE LOG Corrective Action Site Investigation, Source Assessment, and Risk Assessment Report

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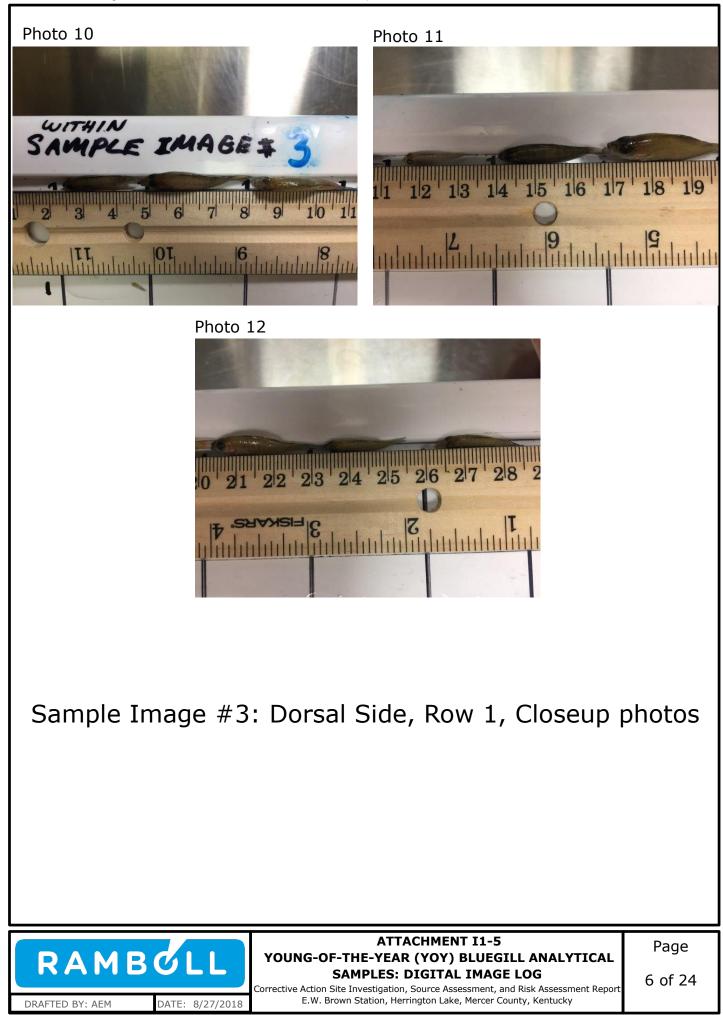
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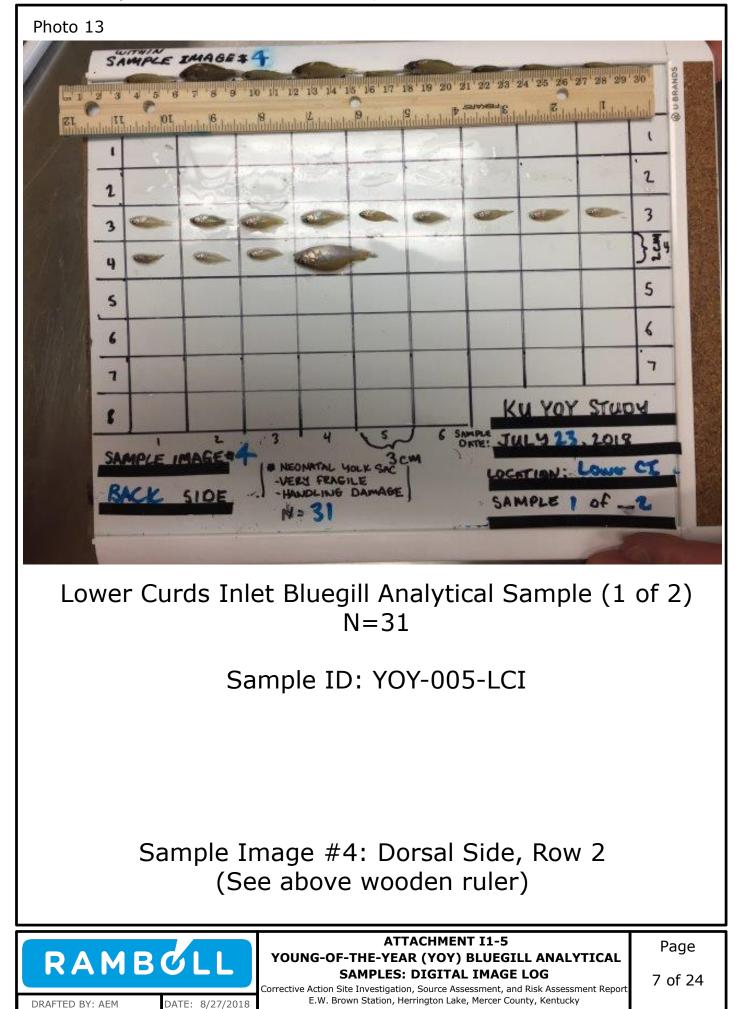
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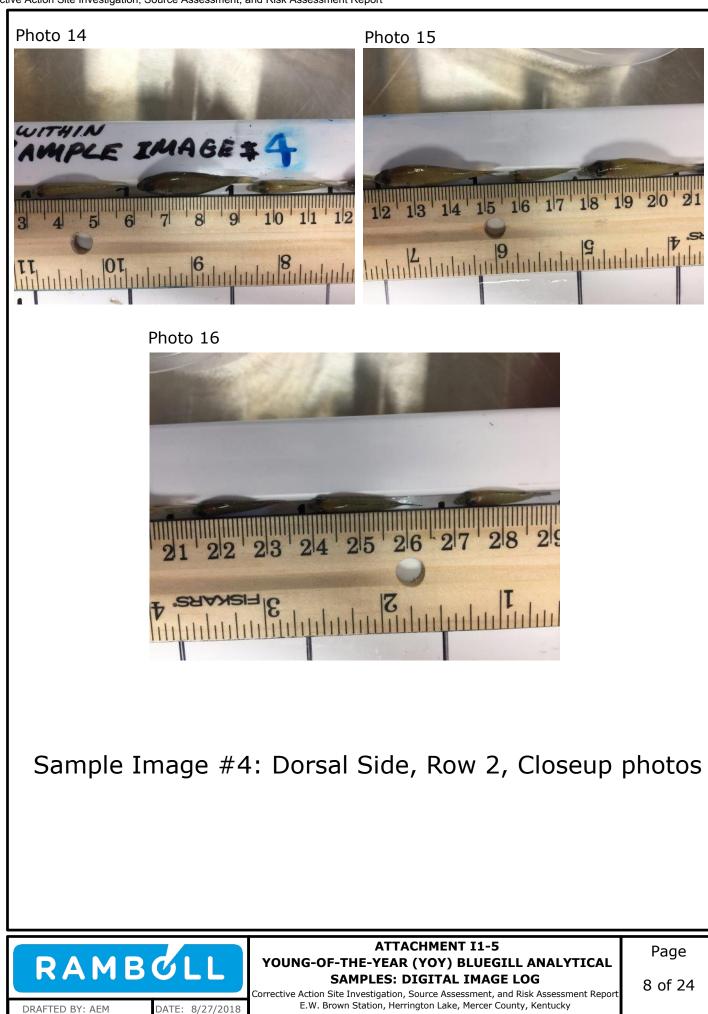
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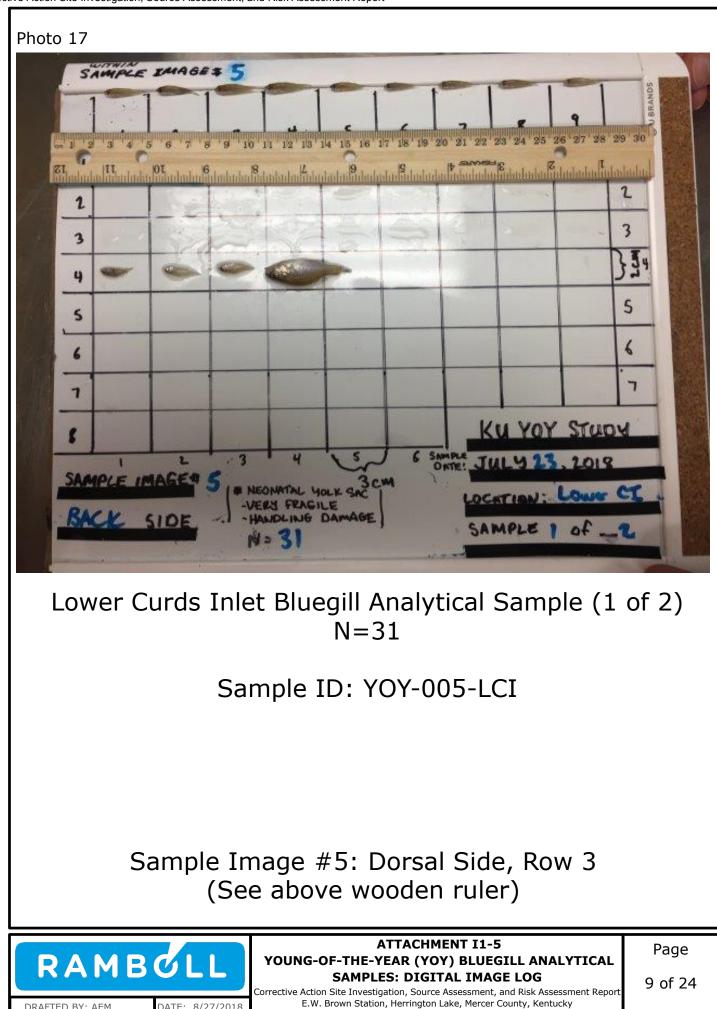


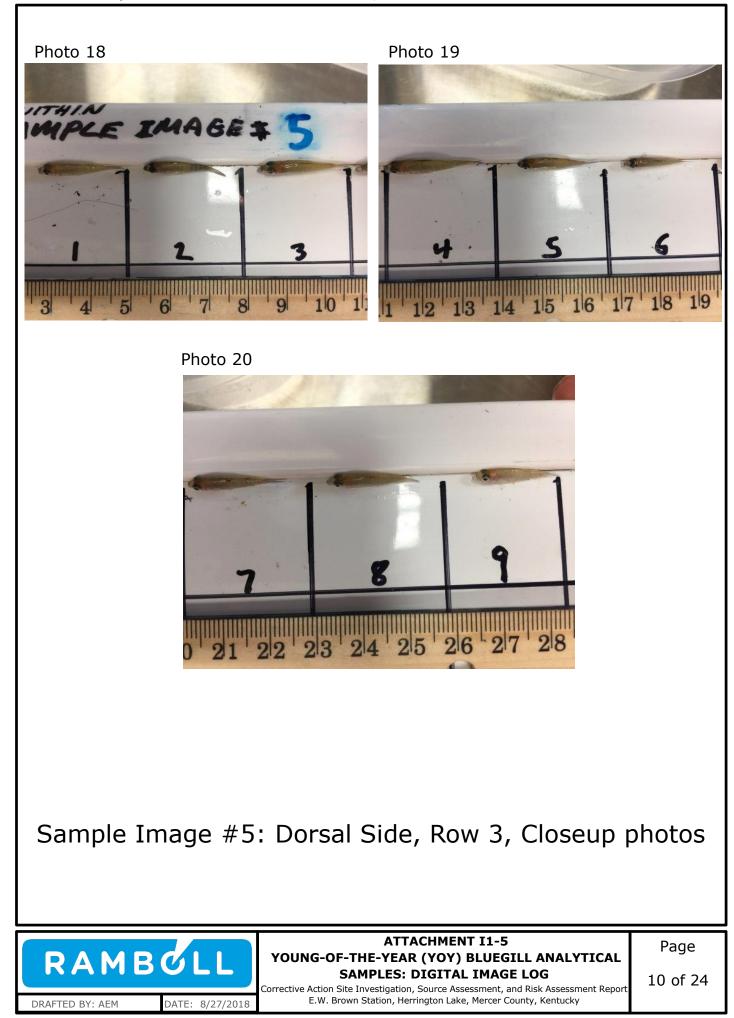


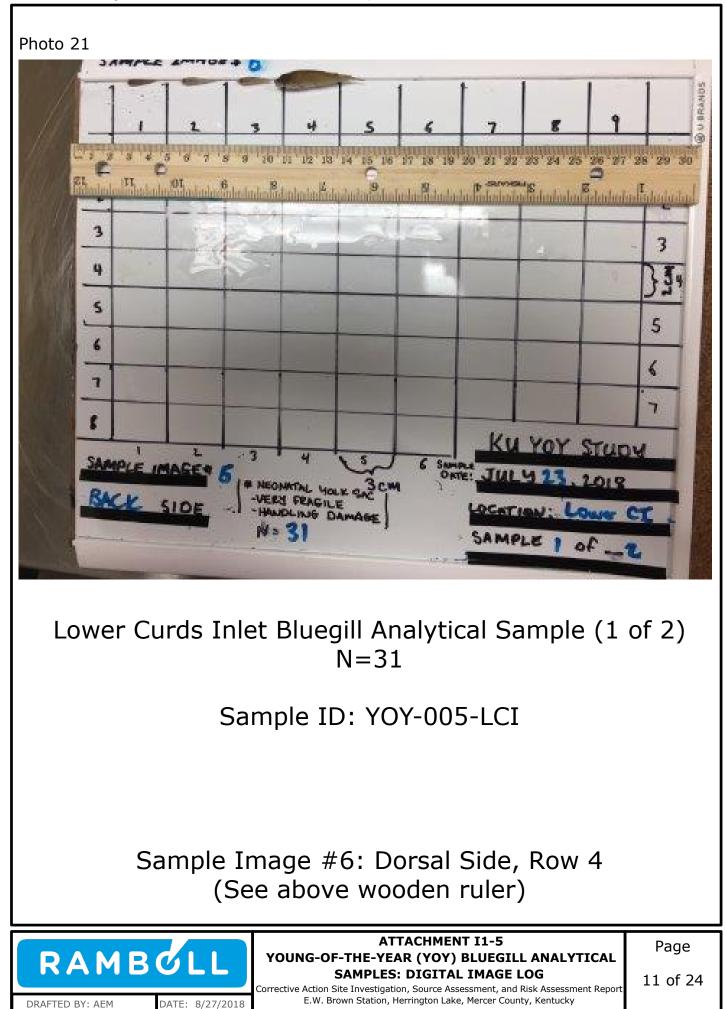


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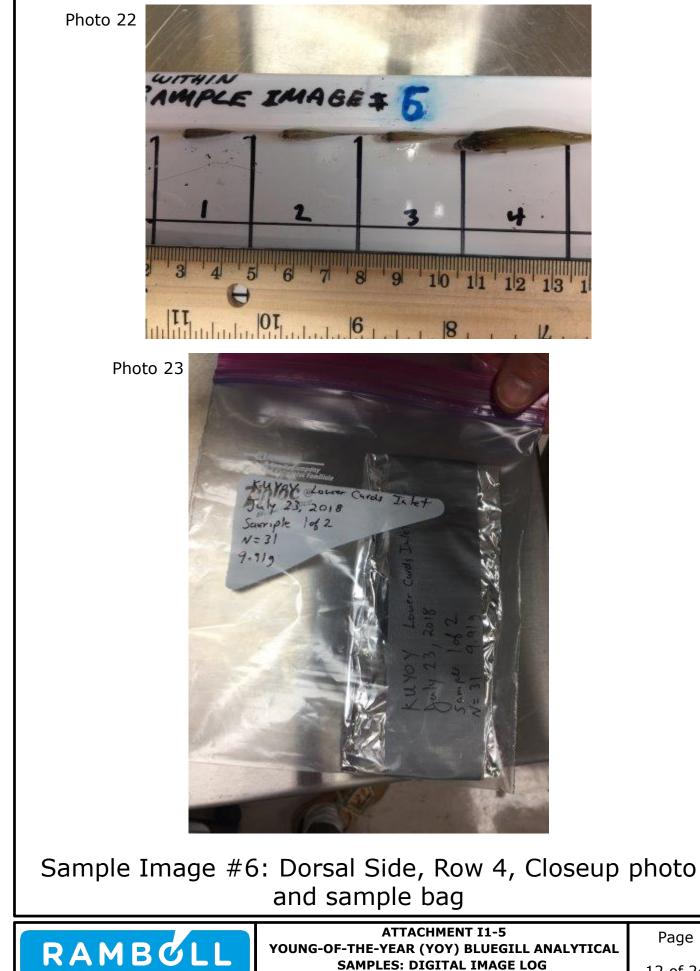




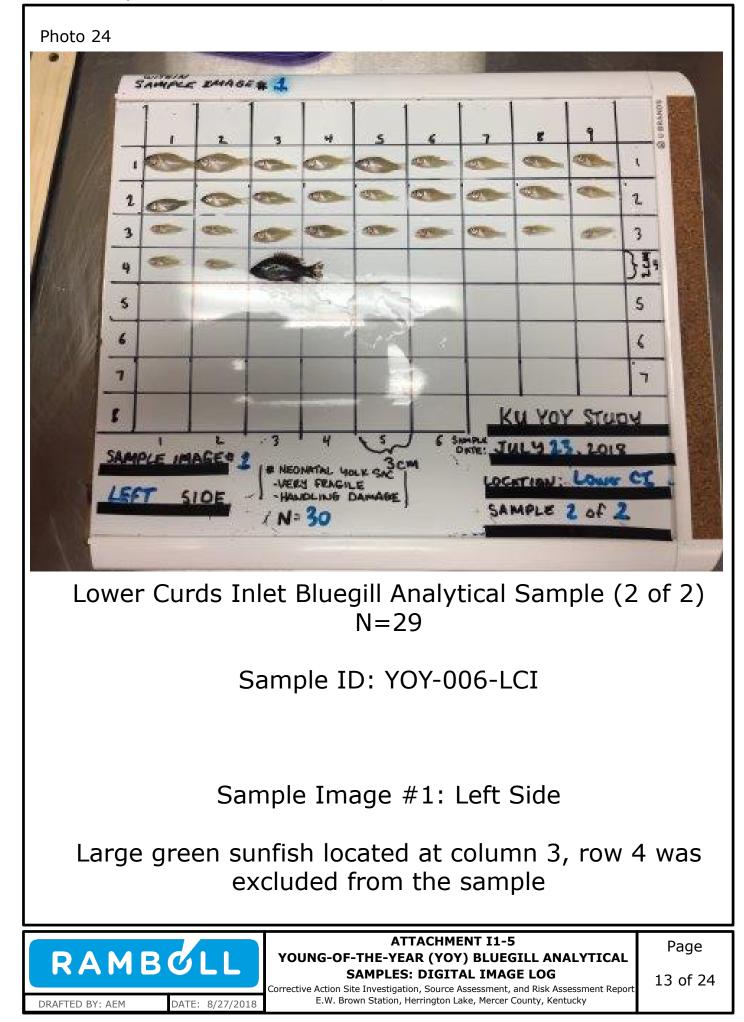


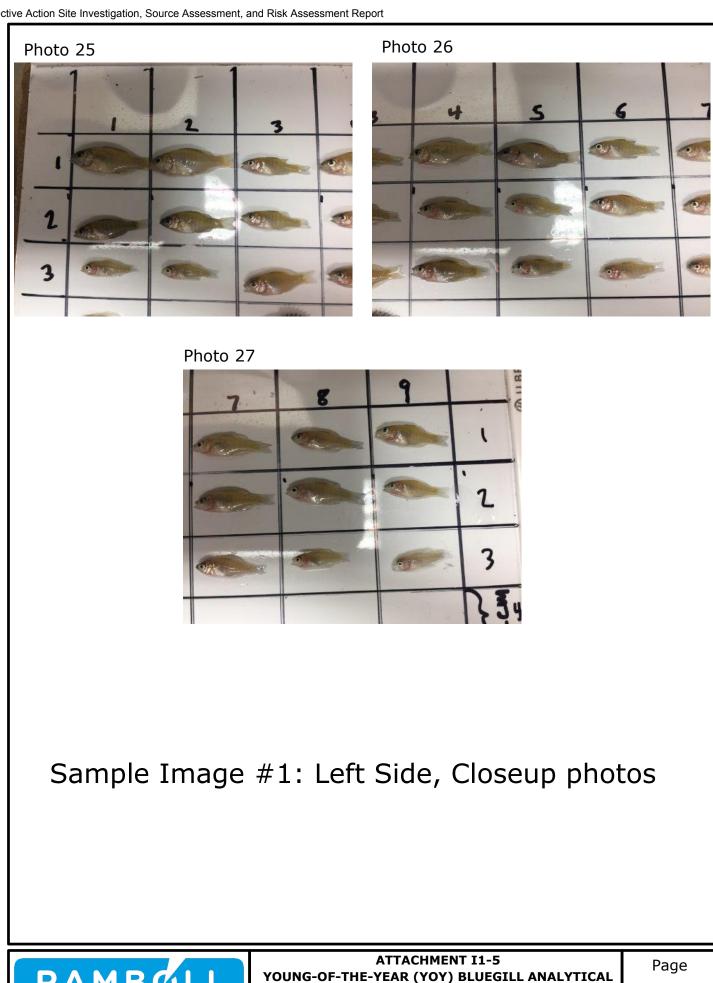
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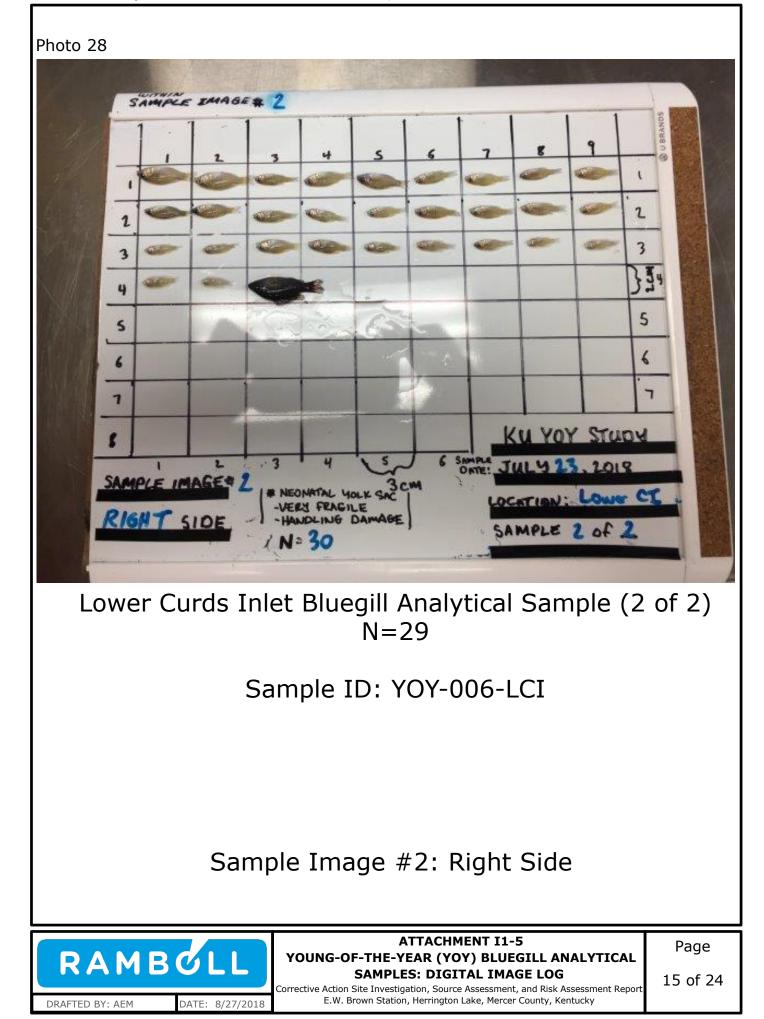
Corrective Action Site Investigation, Source Assessment, and Risk Assessment Report E.W. Brown Station, Herrington Lake, Mercer County, Kentucky

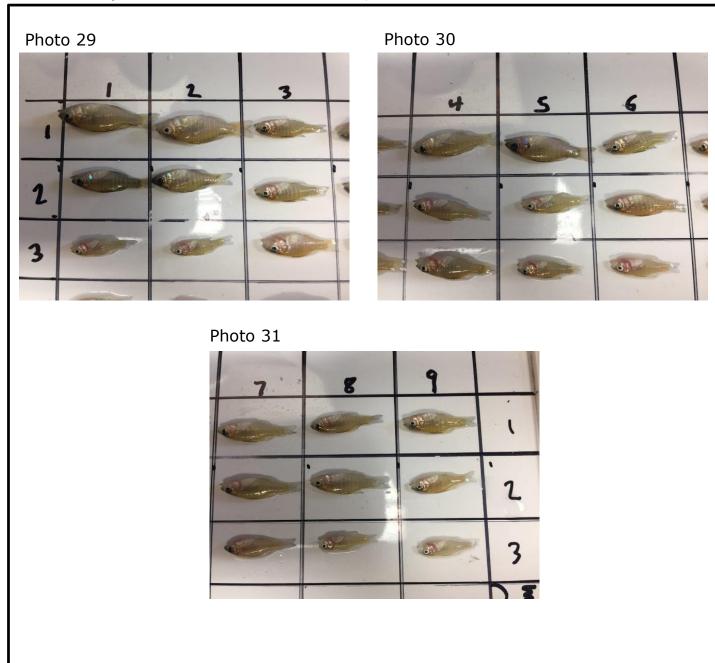




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SAMPLES: DIGITAL IMAGE LOG Corrective Action Site Investigation, Source Assessment, and Risk Assessment Report E.W. Brown Station, Herrington Lake, Mercer County, Kentucky





Sample Image #2: Right Side, Closeup photos



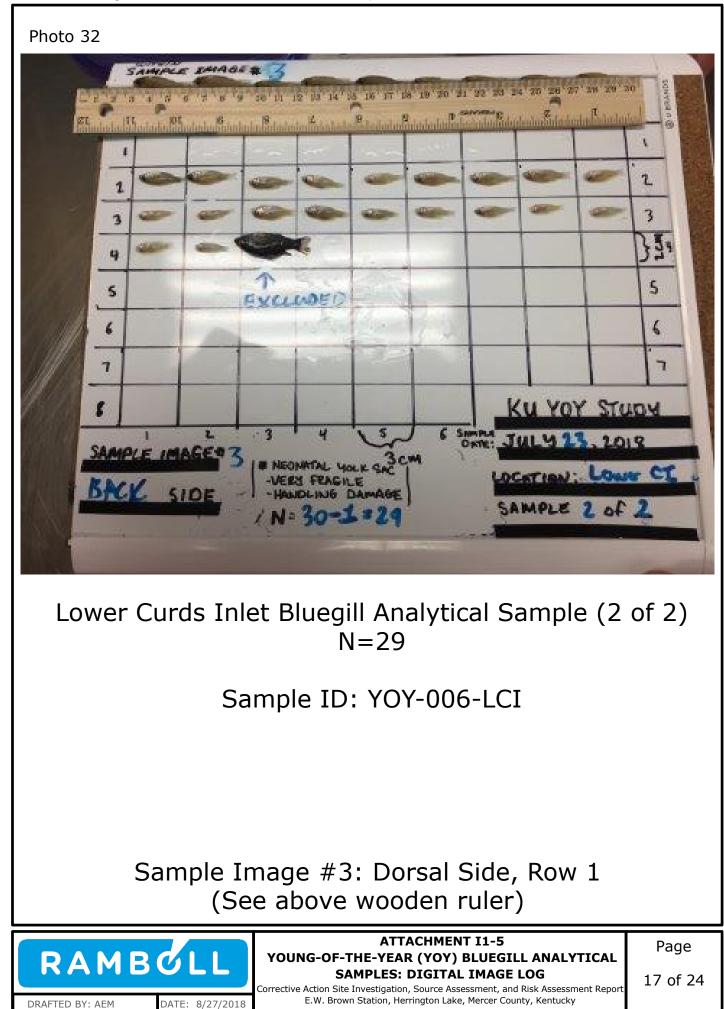
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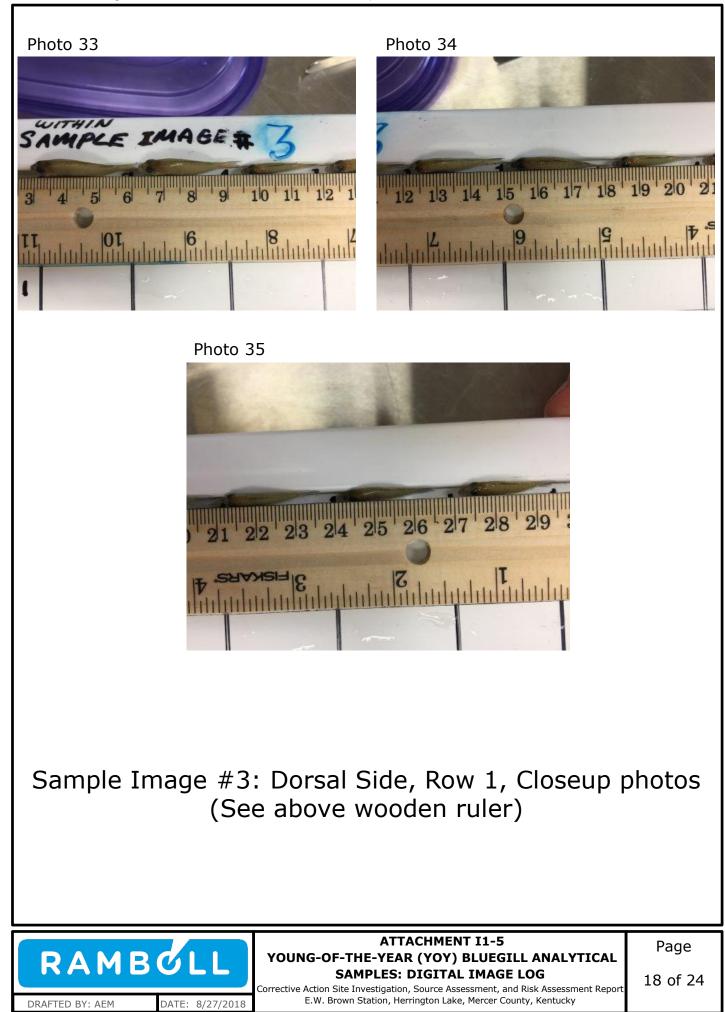
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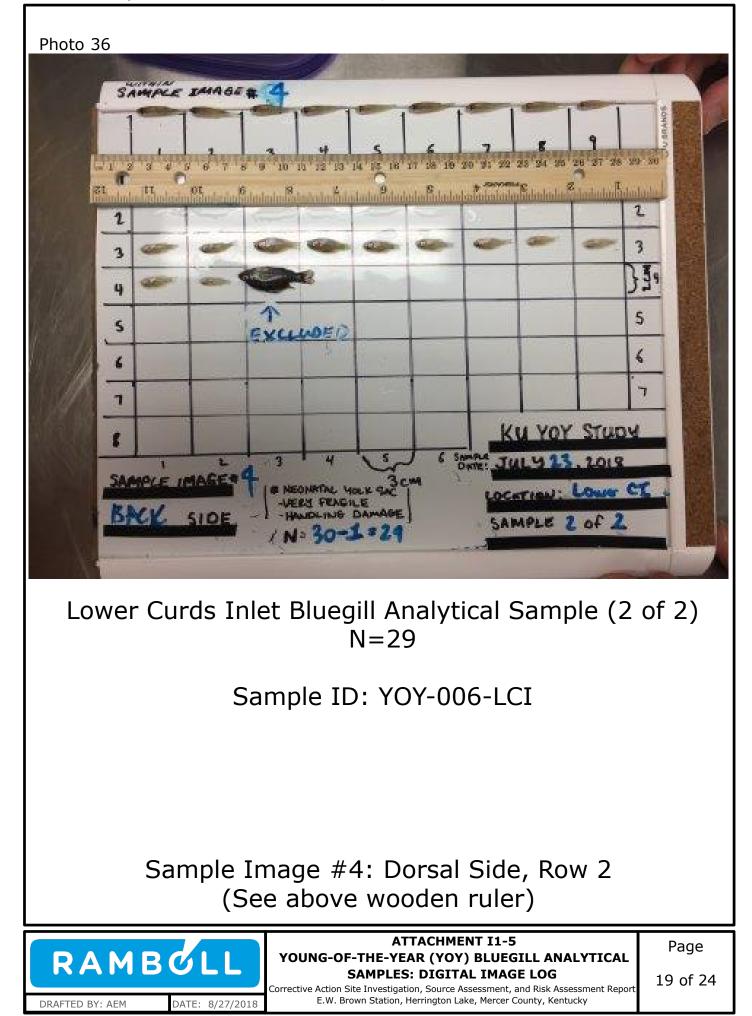
ATTACHMENT I1-5 YOUNG-OF-THE-YEAR (YOY) BLUEGILL ANALYTICAL SAMPLES: DIGITAL IMAGE LOG Corrective Action Site Investigation, Source Assessment, and Risk Assessment Report

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Sample Image #4: Dorsal Side, Row 2, Closeup Photos



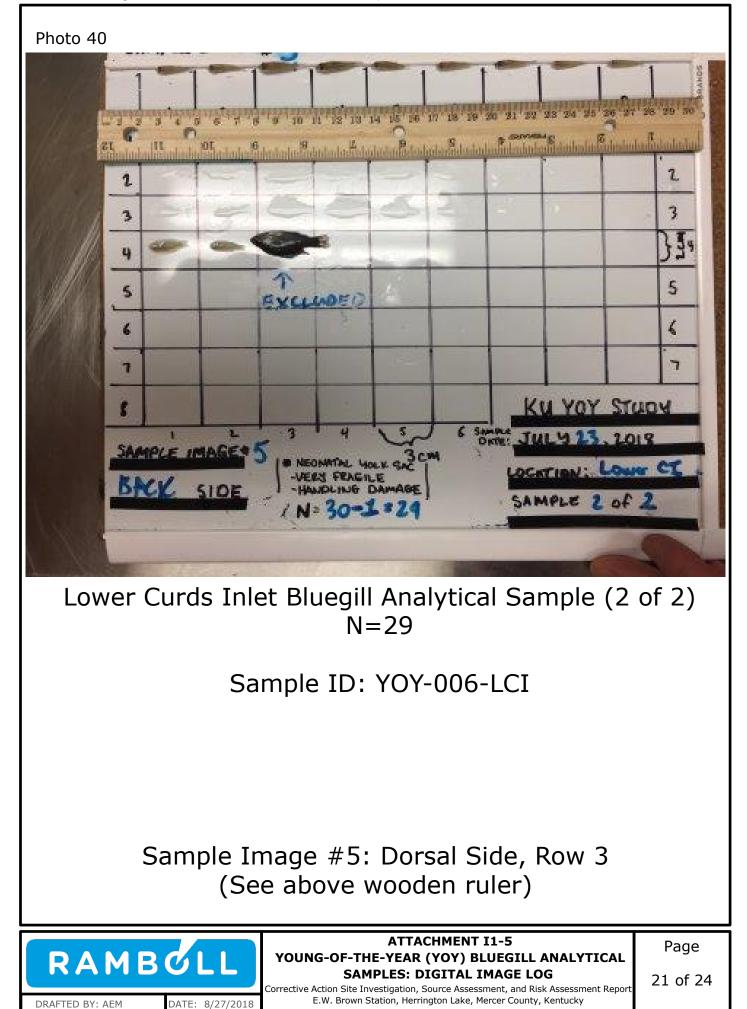
ATTACHMENT I1-5 YOUNG-OF-THE-YEAR (YOY) BLUEGILL ANALYTICAL SAMPLES: DIGITAL IMAGE LOG Corrective Action Site Investigation, Source Assessment, and Risk Assessment Report

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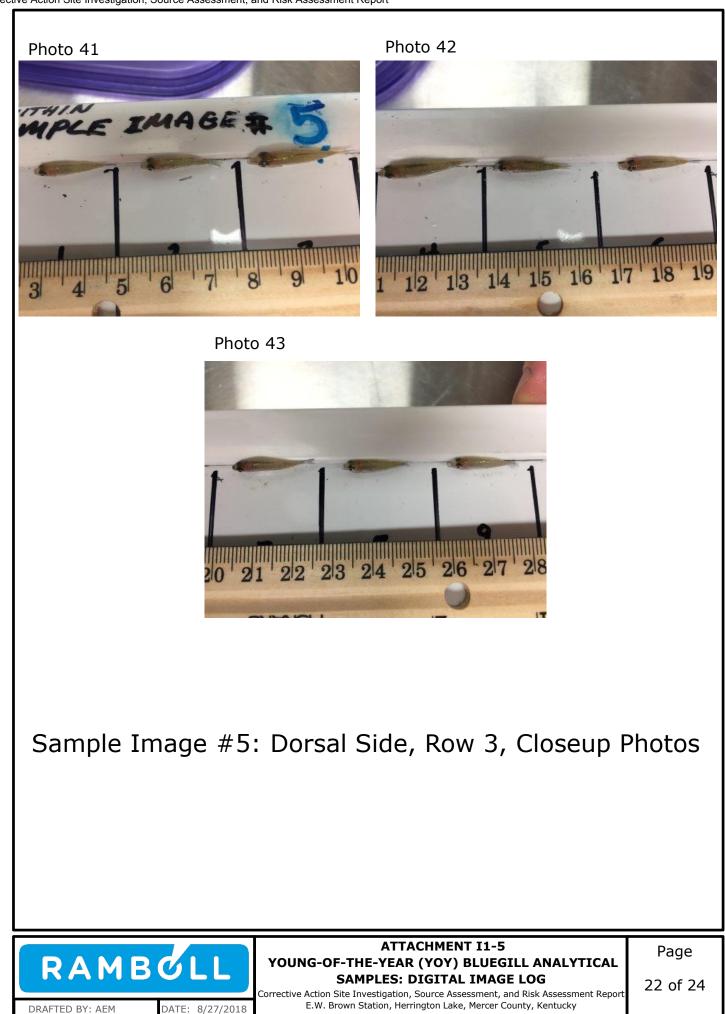


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Photo 46



# Sample Image #6: Dorsal Side, Row 4, Closeup photo and sample bag



ATTACHMENT I1-5 YOUNG-OF-THE-YEAR (YOY) BLUEGILL ANALYTICAL SAMPLES: DIGITAL IMAGE LOG Corrective Action Site Investigation, Source Assessment, and Risk Assessment Report E.W. Brown Station, Herrington Lake, Mercer County, Kentucky

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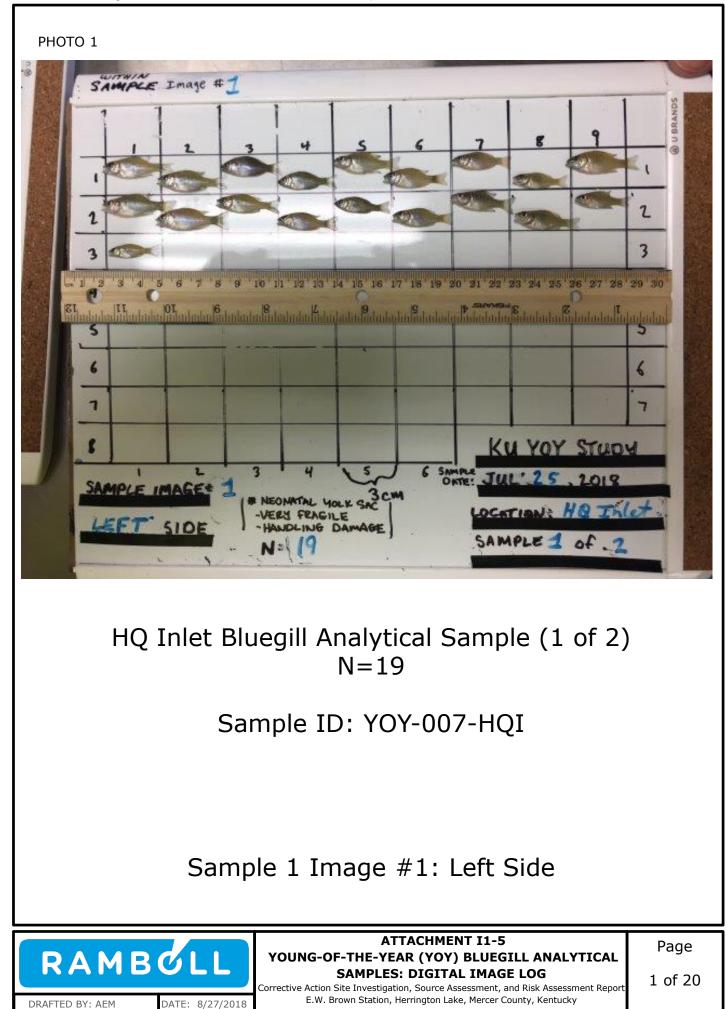


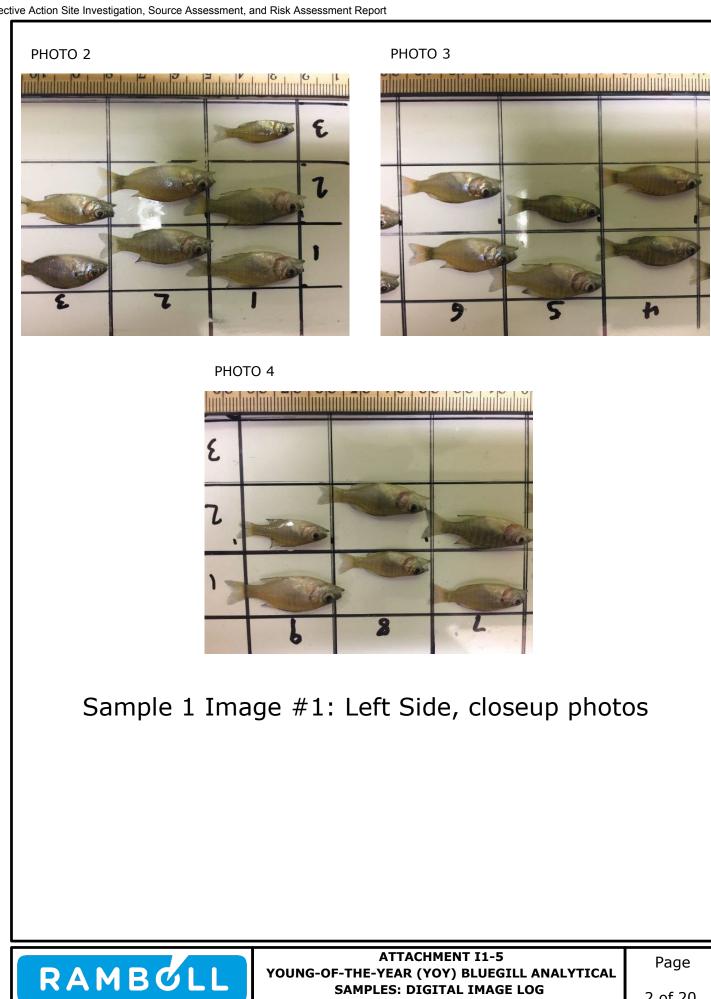
### ATTACHMENT I1-5 YOUNG-OF-THE-YEAR (YOY) BLUEGILL ANALYTICAL SAMPLES: DIGITAL IMAGE LOG

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Corrective Action Site Investigation, Source Assessment, and Risk Assessment Report E.W. Brown Station, Herrington Lake, Mercer County, Kentucky

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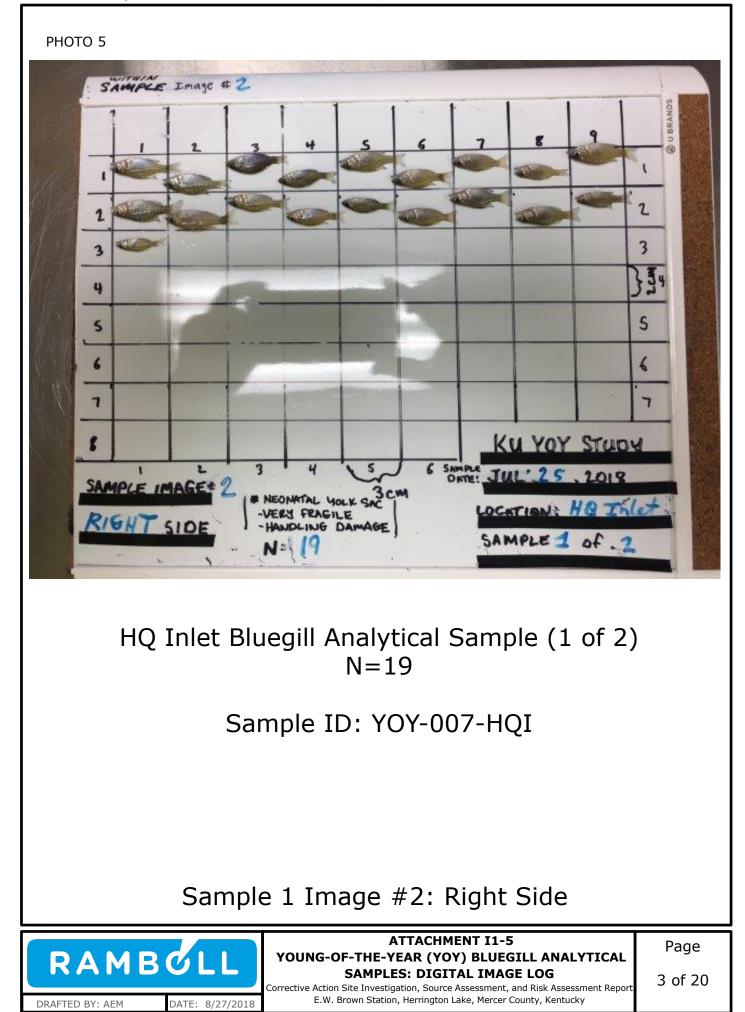


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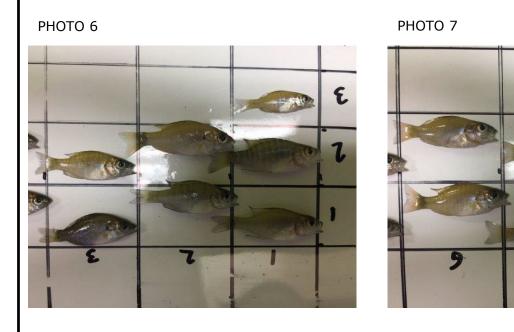


PHOTO 8



Sample 1 Image #2: Right Side, closeup photos



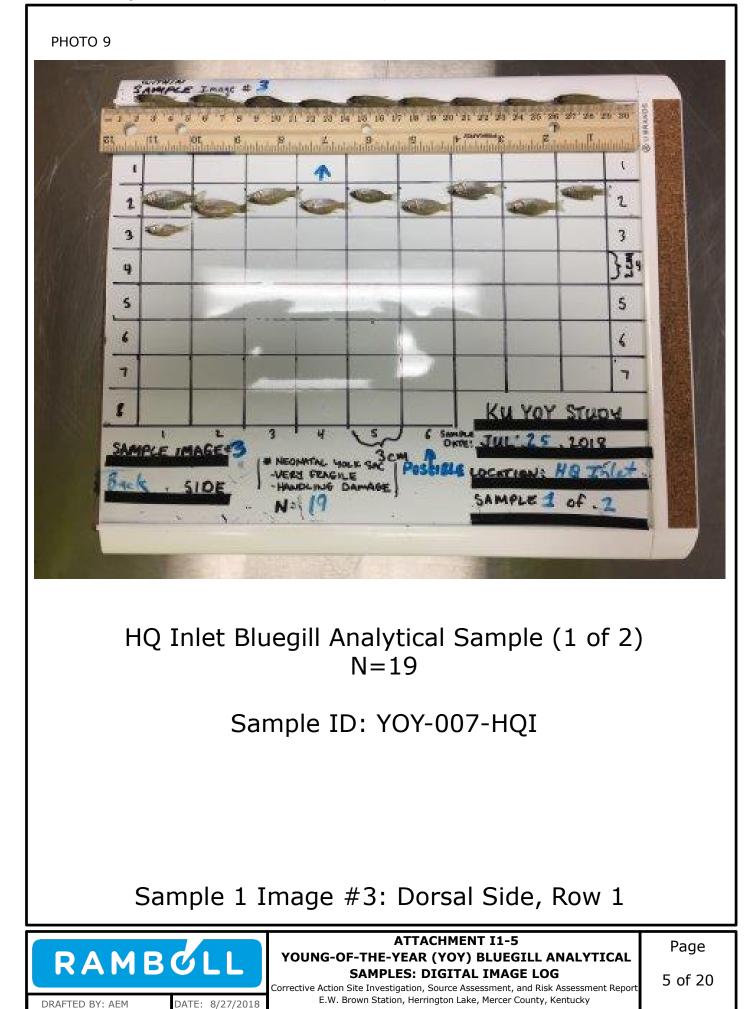
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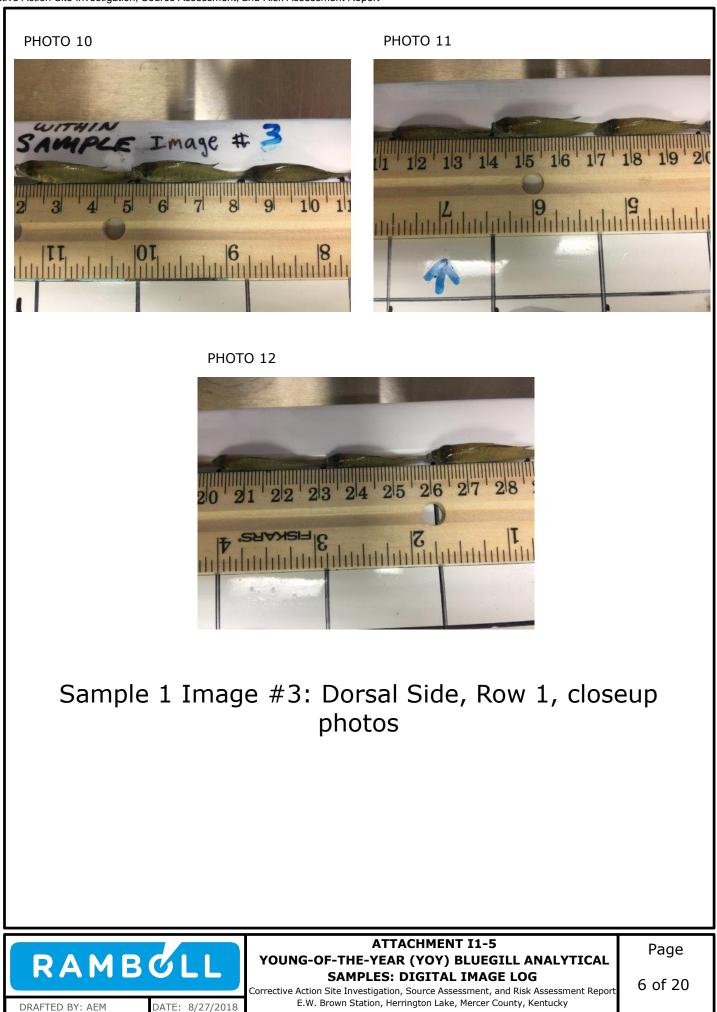
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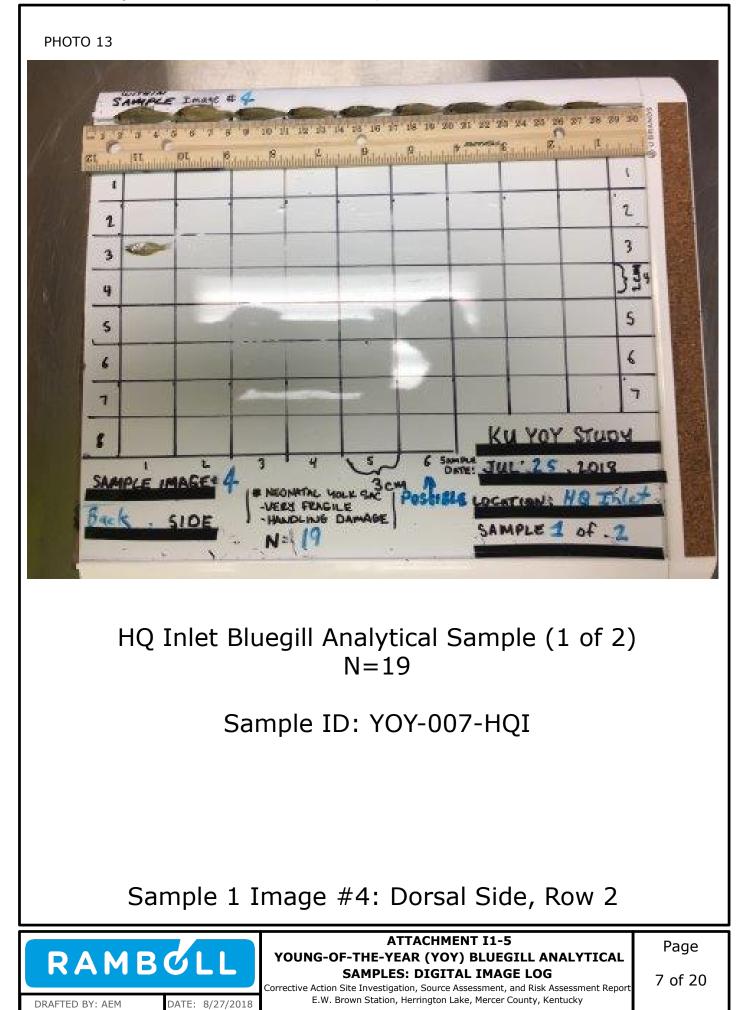
ATTACHMENT I1-5 YOUNG-OF-THE-YEAR (YOY) BLUEGILL ANALYTICAL SAMPLES: DIGITAL IMAGE LOG Corrective Action Site Investigation, Source Assessment, and Risk Assessment Report

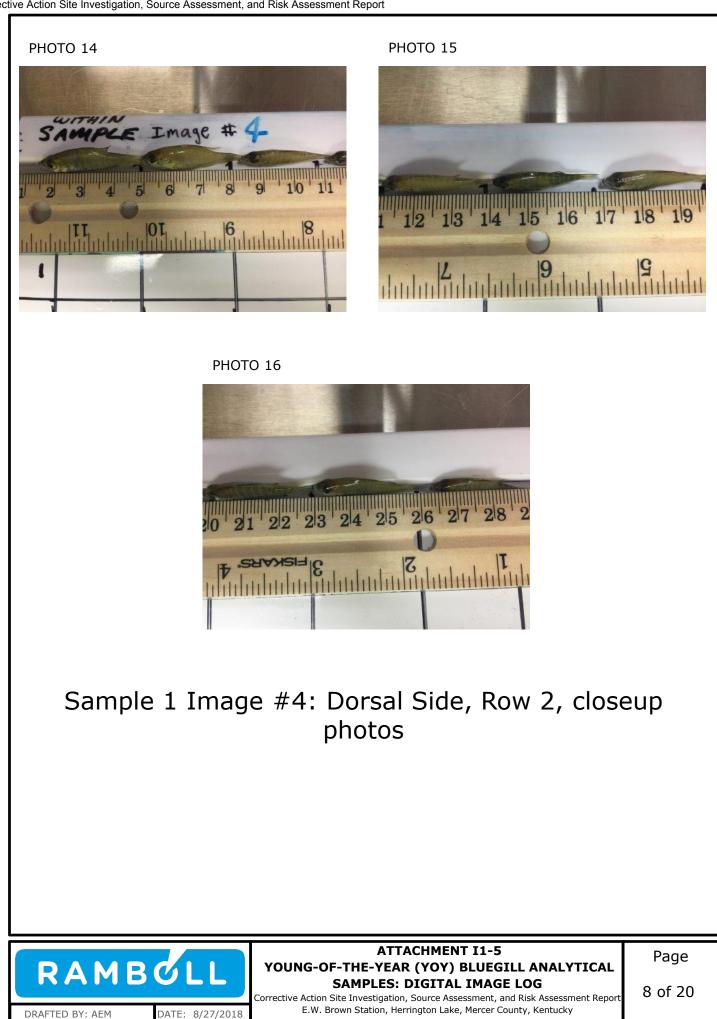
E.W. Brown Station, Herrington Lake, Mercer County, Kentucky

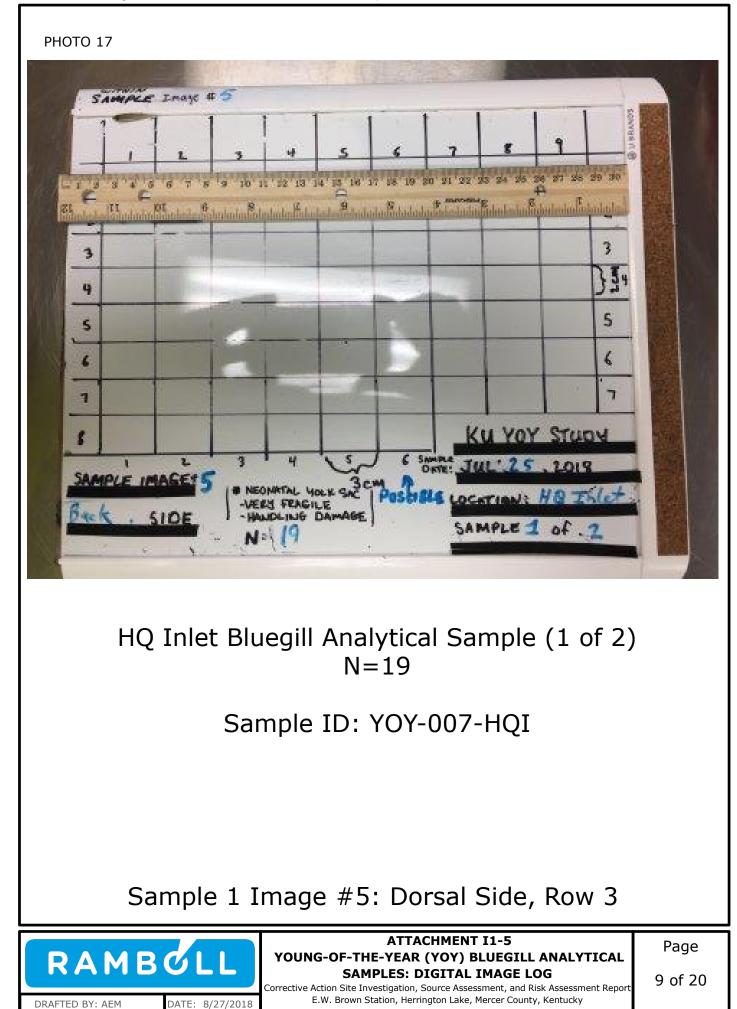
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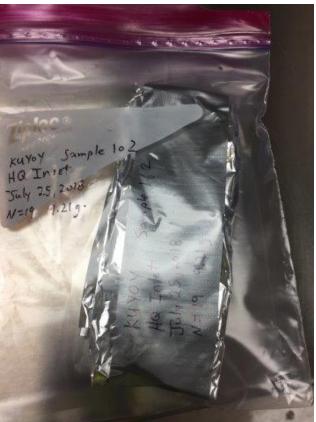








#### **PHOTO 19**



Sample 1 Image #5: Dorsal Side, Row 3, closeup photo and sample bag



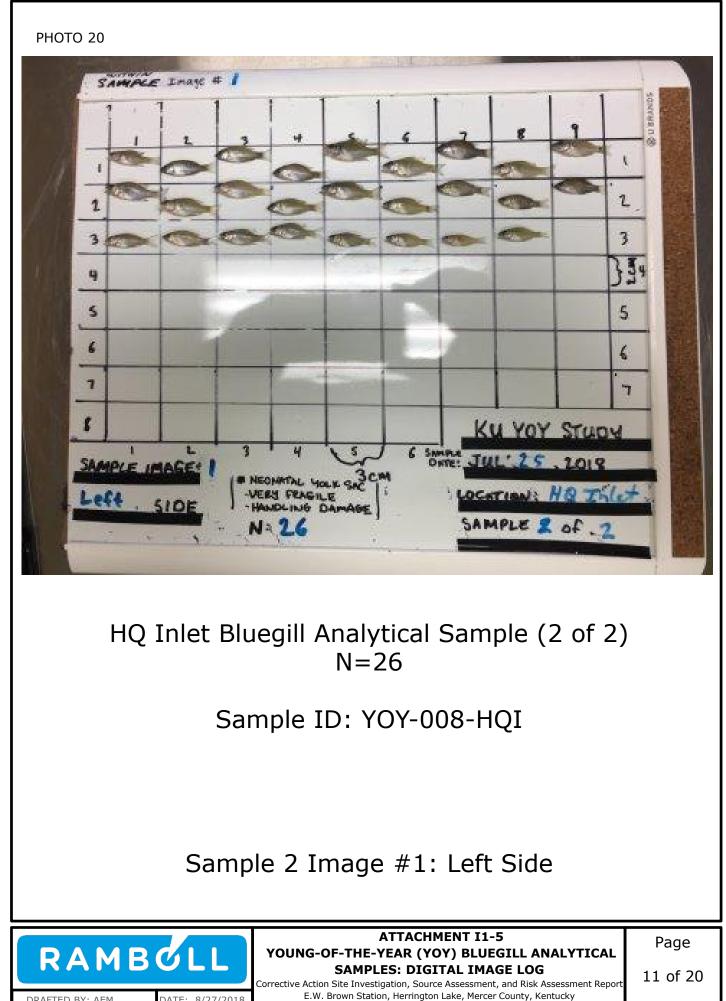
ATTACHMENT I1-5 YOUNG-OF-THE-YEAR (YOY) BLUEGILL ANALYTICAL SAMPLES: DIGITAL IMAGE LOG Corrective Action Site Investigation, Source Assessment, and Risk Assessment Report

E.W. Brown Station, Herrington Lake, Mercer County, Kentucky

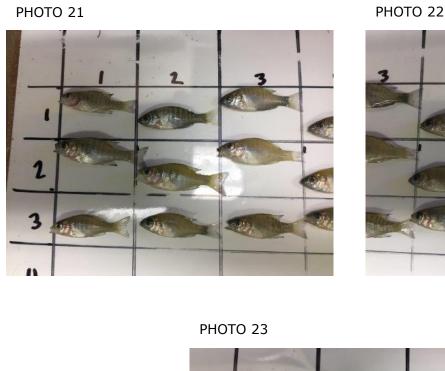
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Sample 2 Image #1: Left Side, closeup photos



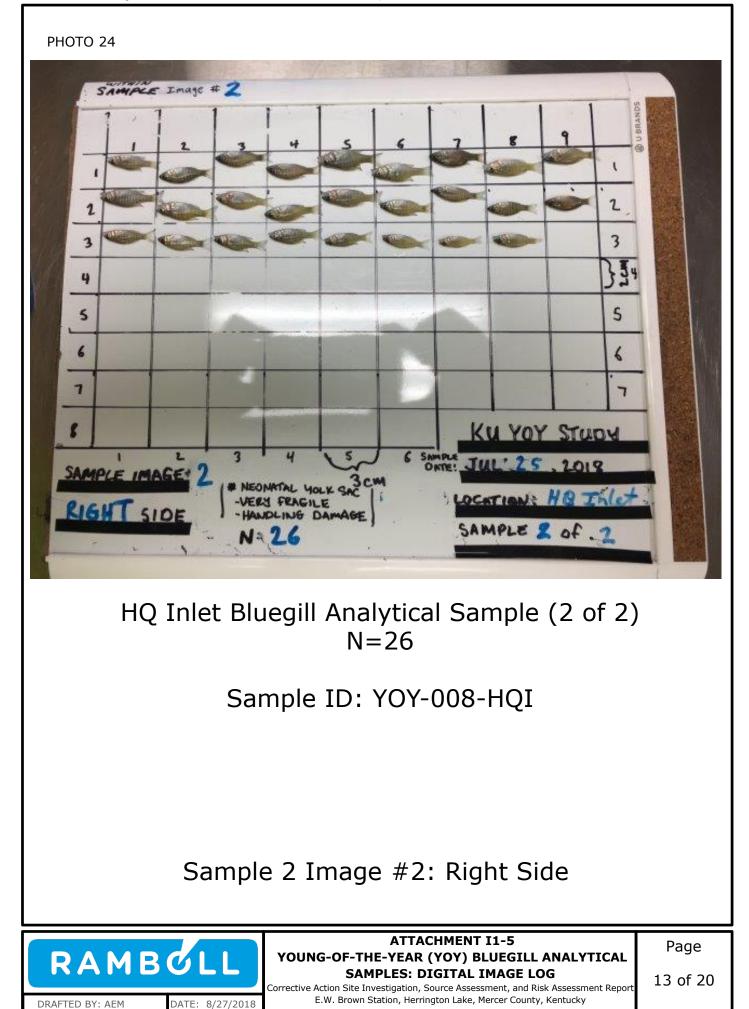
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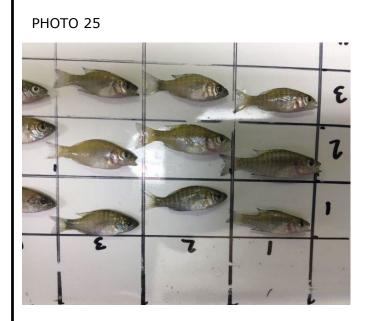
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ATTACHMENT I1-5 YOUNG-OF-THE-YEAR (YOY) BLUEGILL ANALYTICAL SAMPLES: DIGITAL IMAGE LOG Corrective Action Site Investigation, Source Assessment, and Risk Assessment Report

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Sample 2 Image #2: Right Side, closeup photos



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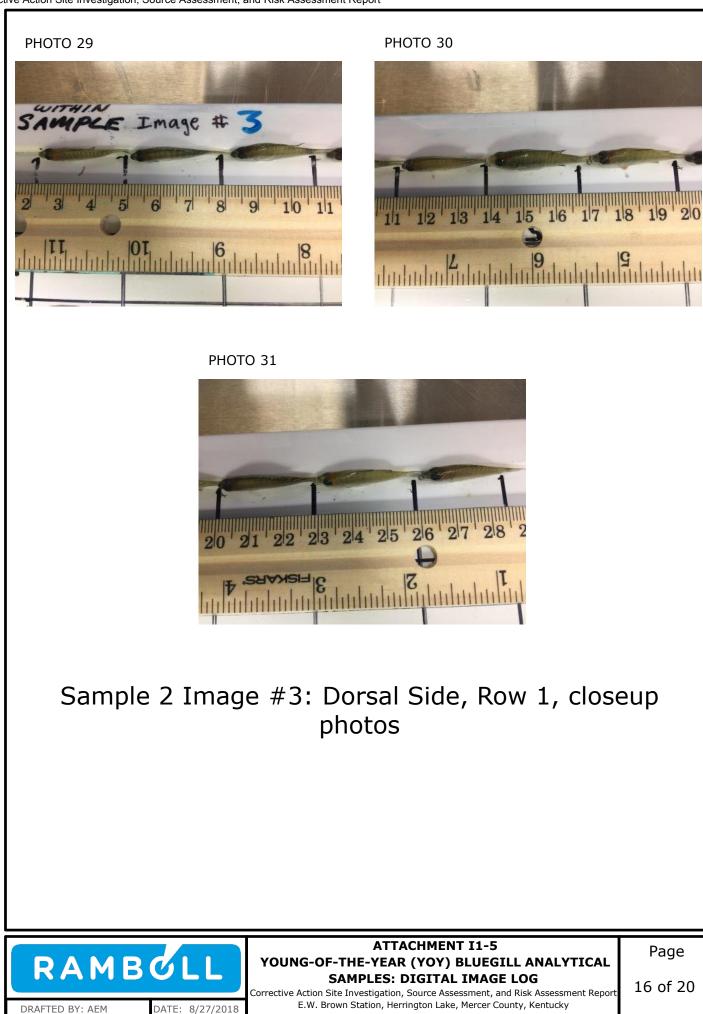
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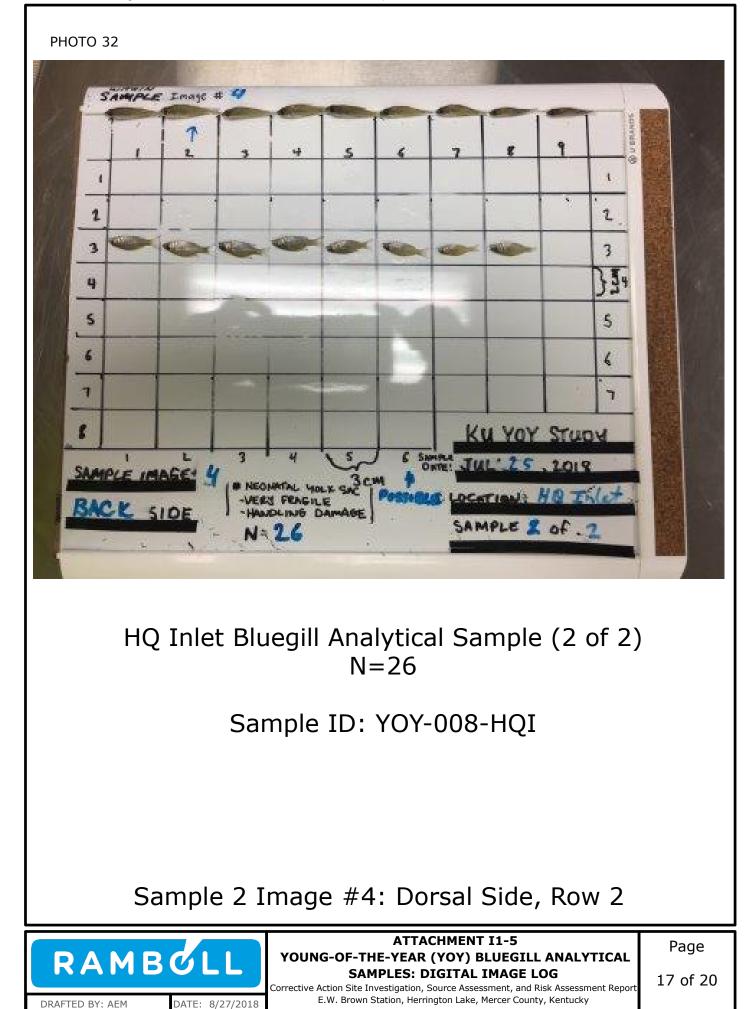
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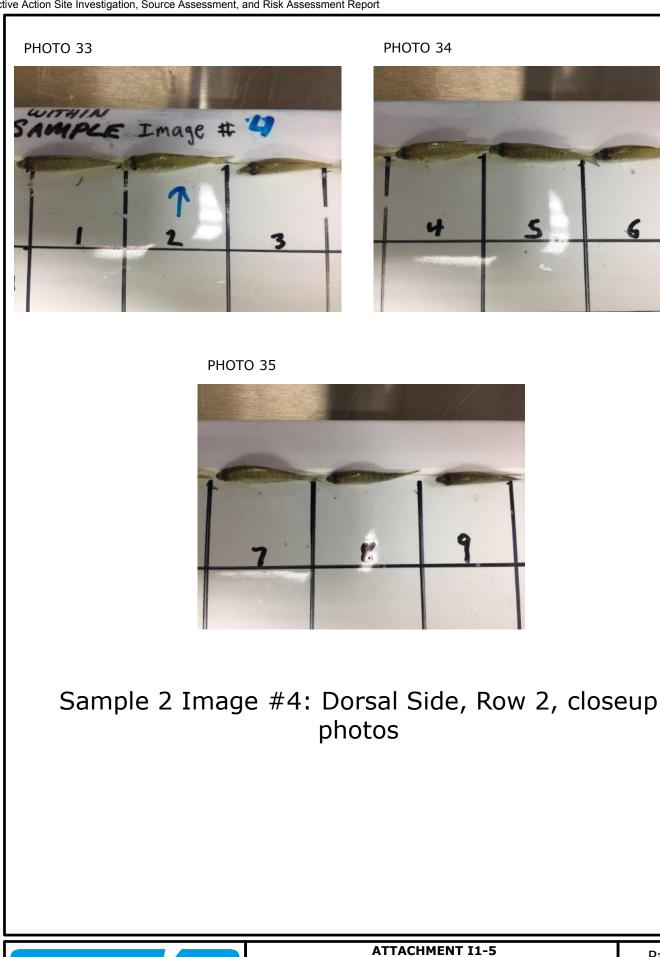
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Corrective Action Site Investigation, Source Assessment, and Risk Assessment Report E.W. Brown Station, Herrington Lake, Mercer County, Kentucky







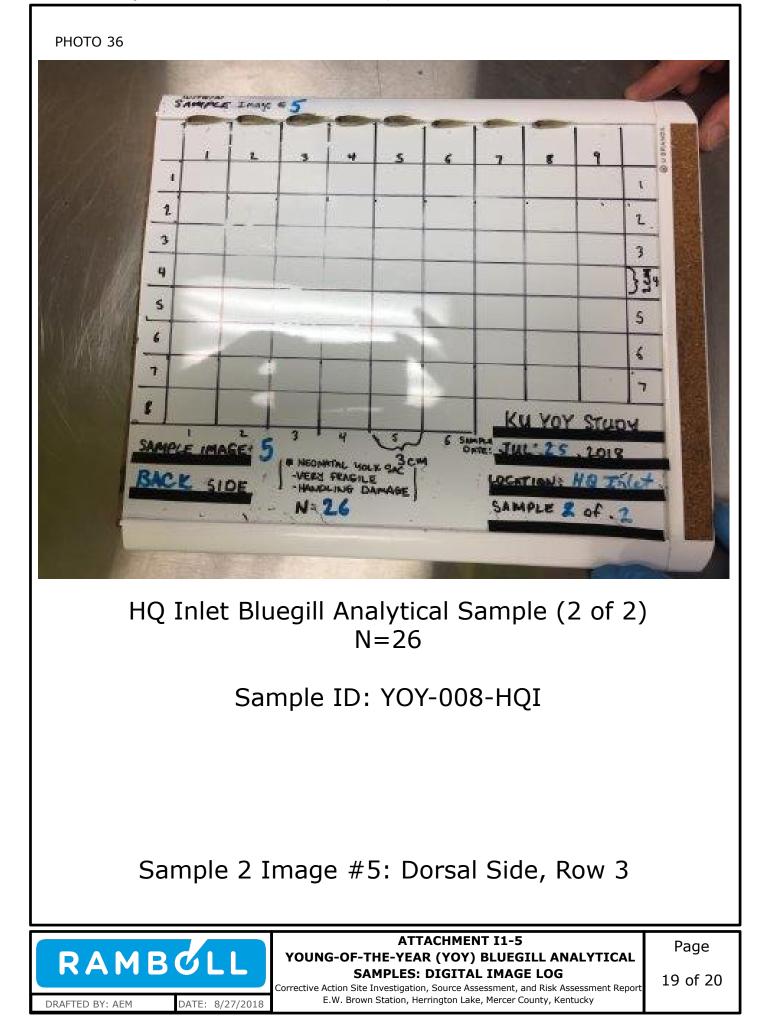
RAMBOLL YOUNG-OF-THE-YEAR (YOY) BLUEGILL ANALYTICAL

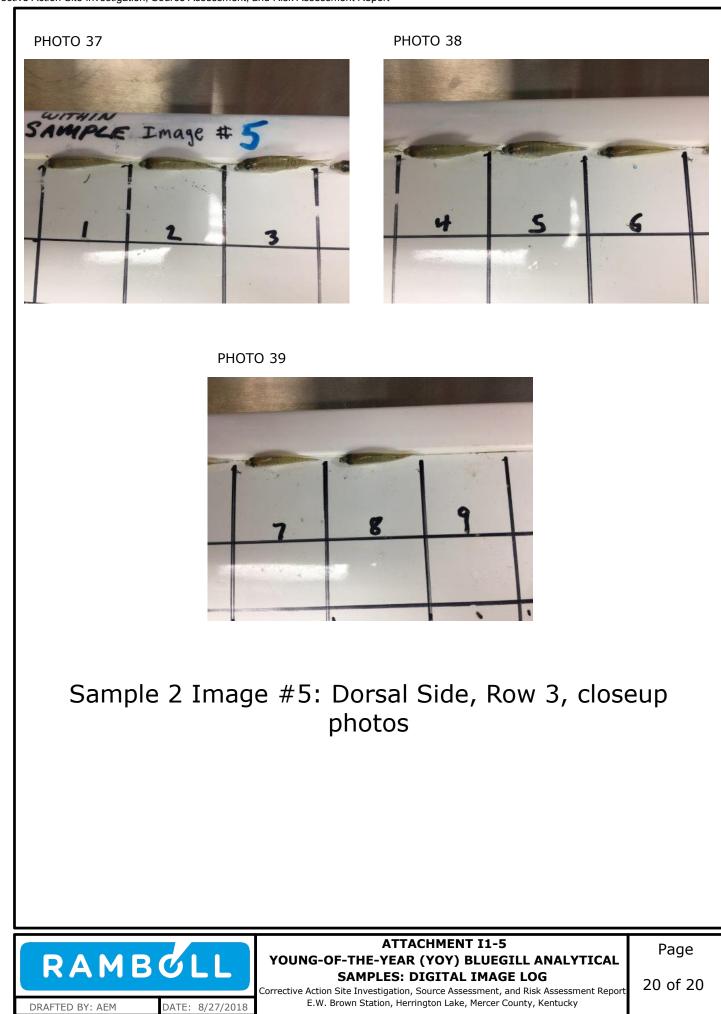
SAMPLES: DIGITAL IMAGE LOG Corrective Action Site Investigation, Source Assessment, and Risk Assessment Report E.W. Brown Station, Herrington Lake, Mercer County, Kentucky

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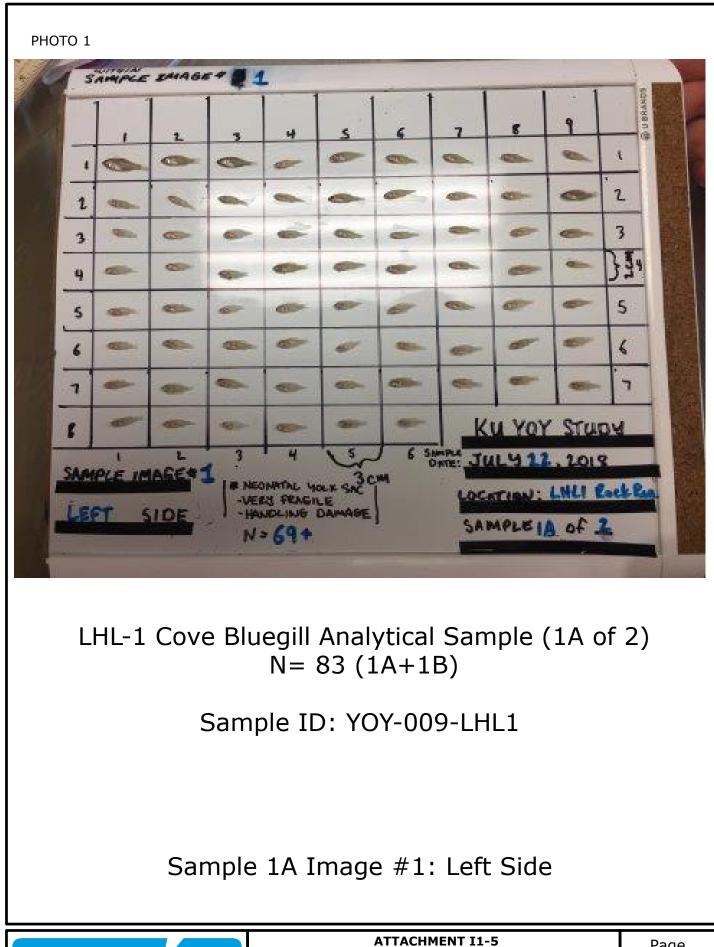


#### ATTACHMENT I1-5 YOUNG-OF-THE-YEAR (YOY) BLUEGILL ANALYTICAL SAMPLES: DIGITAL IMAGE LOG

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Corrective Action Site Investigation, Source Assessment, and Risk Assessment Report E.W. Brown Station, Herrington Lake, Mercer County, Kentucky

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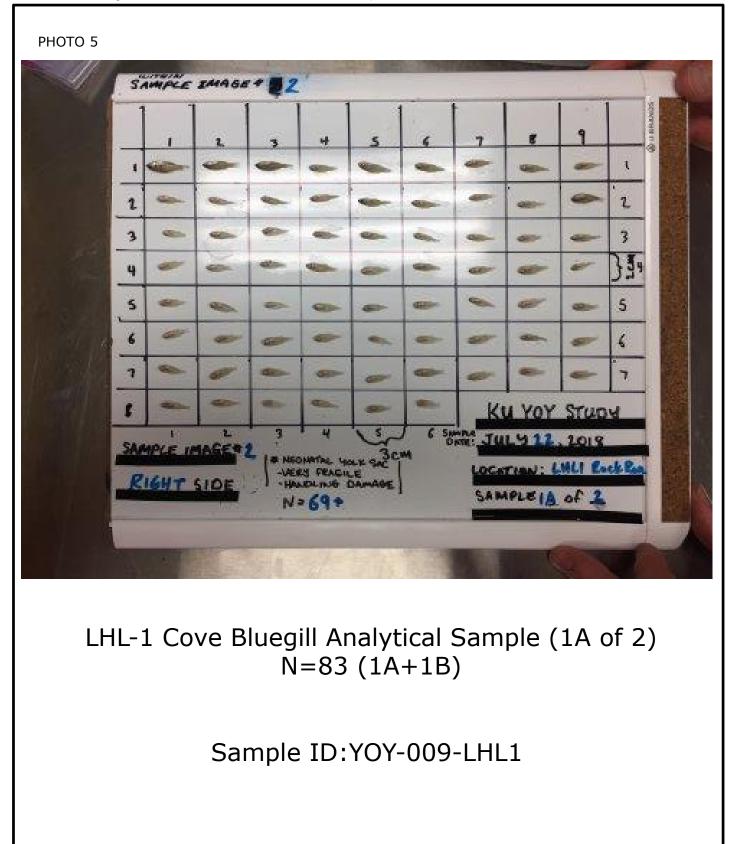




YOUNG-OF-THE-YEAR (YOY) BLUEGILL ANALYTICAL SAMPLES: DIGITAL IMAGE LOG Corrective Action Site Investigation, Source Assessment, and Risk Assessment Report E.W. Brown Station, Herrington Lake, Mercer County, Kentucky

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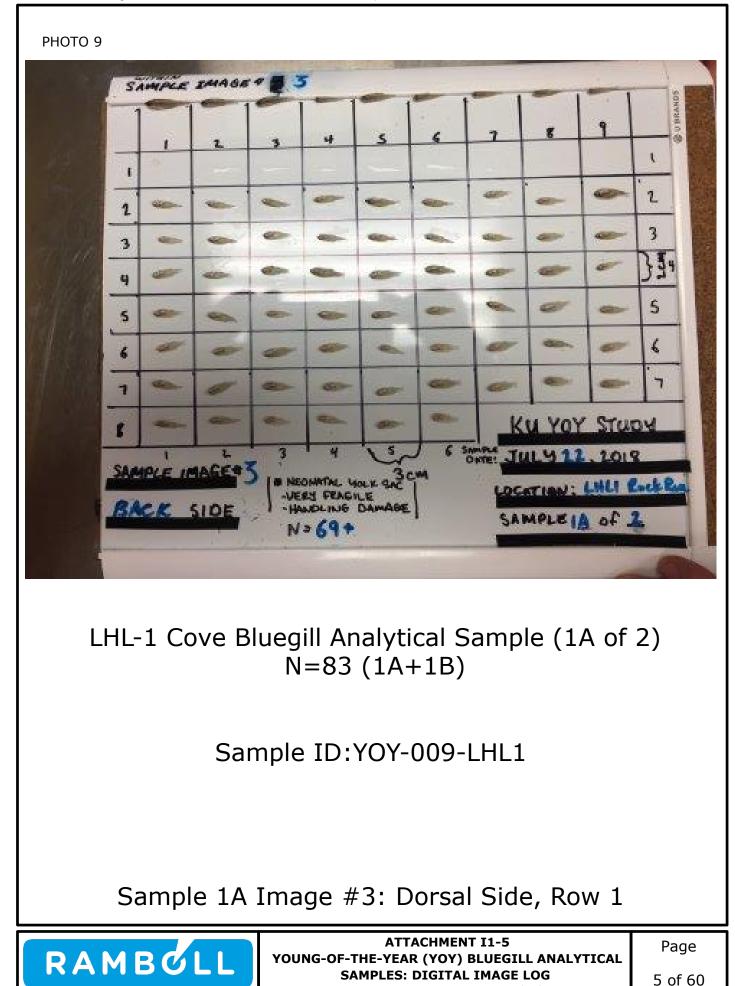
## Sample 1A Image #2: Right Side



ATTACHMENT I1-5 YOUNG-OF-THE-YEAR (YOY) BLUEGILL ANALYTICAL SAMPLES: DIGITAL IMAGE LOG Corrective Action Site Investigation, Source Assessment, and Risk Assessment Report E.W. Brown Station, Herrington Lake, Mercer County, Kentucky

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PHOTO 11





Sample 1A Image #3: Dorsal Side, Row 1, closeup photos



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ATTACHMENT I1-5 YOUNG-OF-THE-YEAR (YOY) BLUEGILL ANALYTICAL SAMPLES: DIGITAL IMAGE LOG Corrective Action Site Investigation, Source Assessment, and Risk Assessment Report

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ve Action Site Investigation, Source Assessment, and Risk Assessment E.W. Brown Station, Herrington Lake, Mercer County, Kentucky

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**PHOTO 15** 







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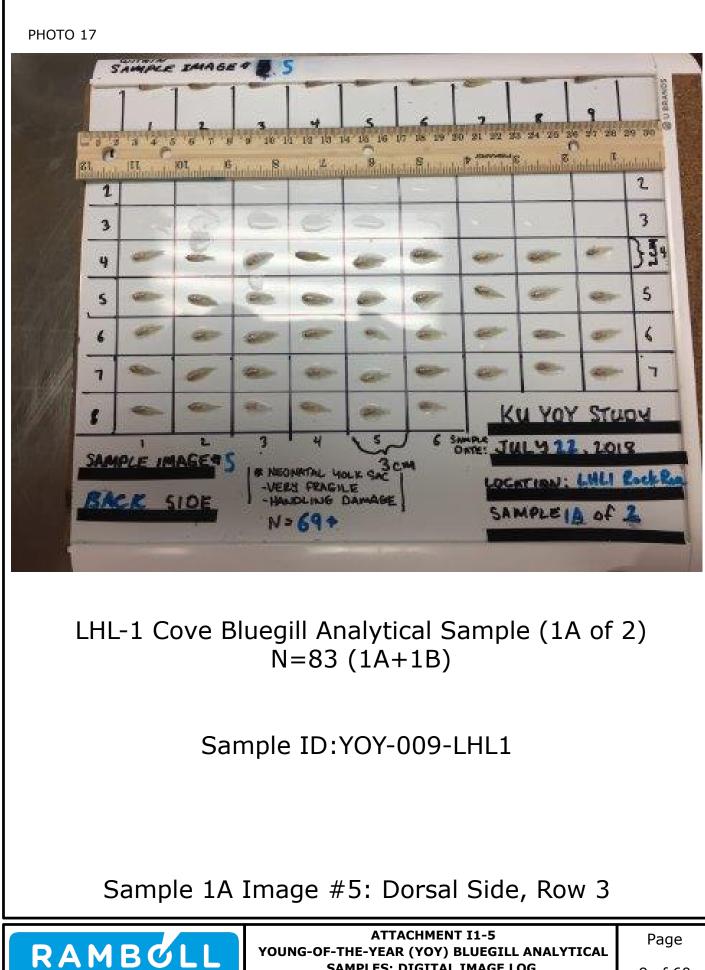
DATE: 8/27/2018

**ATTACHMENT I1-5** YOUNG-OF-THE-YEAR (YOY) BLUEGILL ANALYTICAL SAMPLES: DIGITAL IMAGE LOG Corrective Action Site Investigation, Source Assessment, and Risk Assessment Report

Page

8 of 60

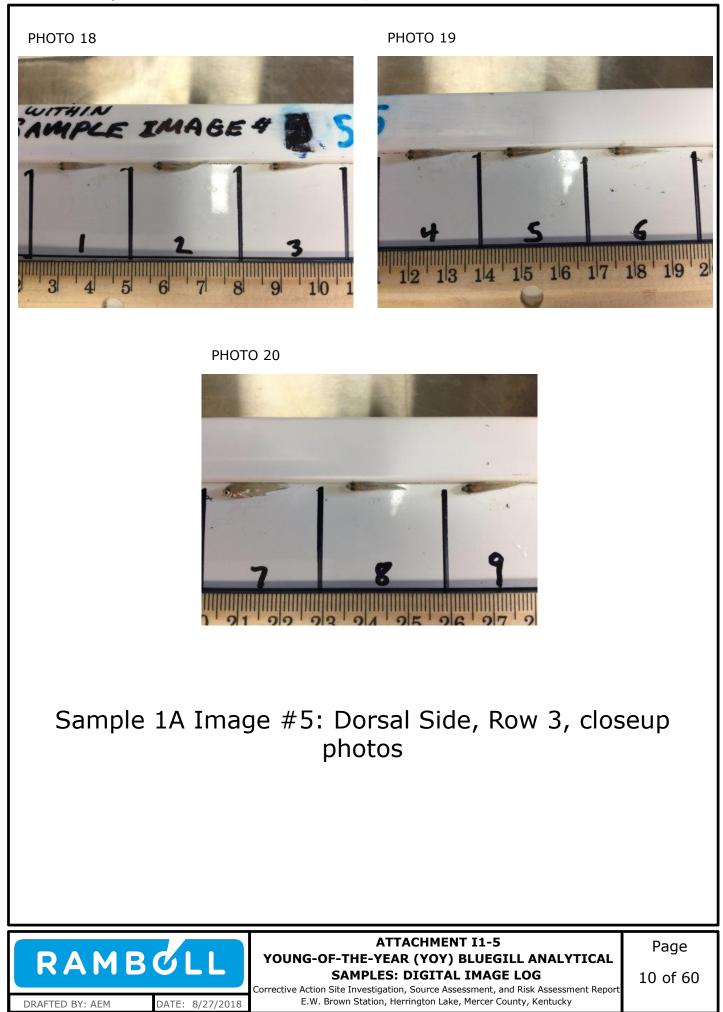
E.W. Brown Station, Herrington Lake, Mercer County, Kentucky



DRAFTED BY: AEM

DATE: 8/27/2018

SAMPLES: DIGITAL IMAGE LOG Corrective Action Site Investigation, Source Assessment, and Risk Assessment Report E.W. Brown Station, Herrington Lake, Mercer County, Kentucky

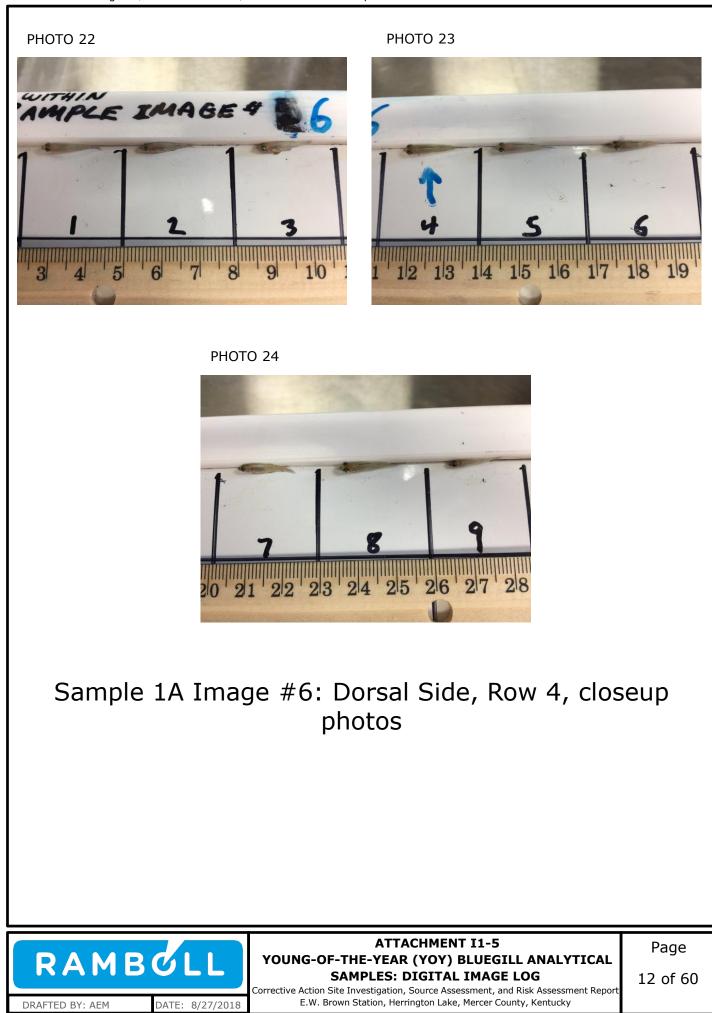


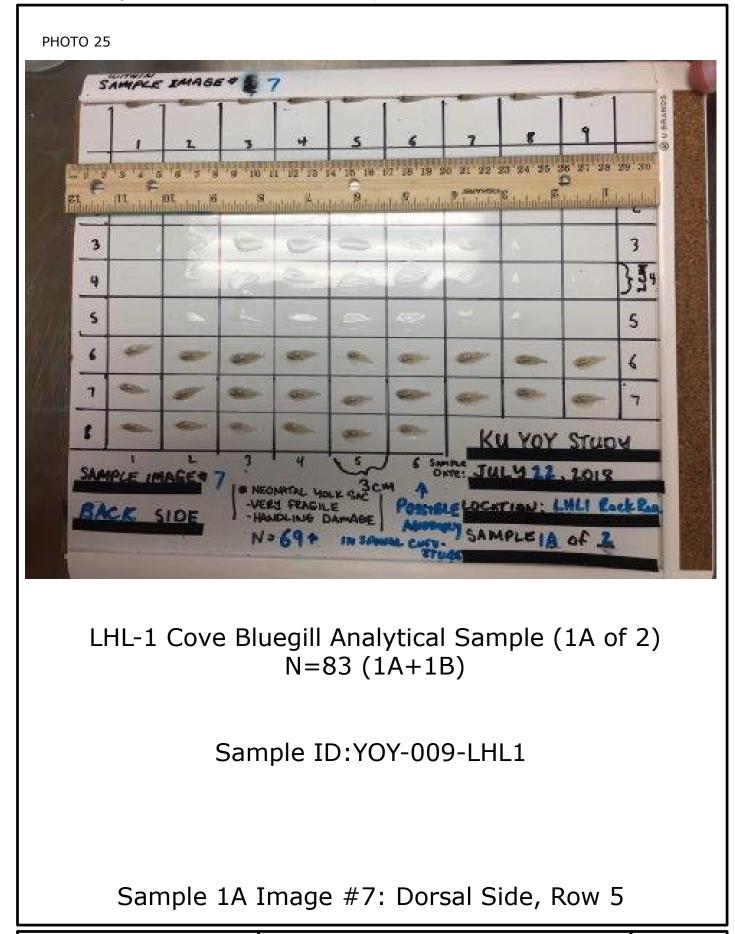
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ATTACHMENT I1-5 YOUNG-OF-THE-YEAR (YOY) BLUEGILL ANALYTICAL SAMPLES: DIGITAL IMAGE LOG Corrective Action Site Investigation, Source Assessment, and Risk Assessment Report E.W. Brown Station, Herrington Lake, Mercer County, Kentucky

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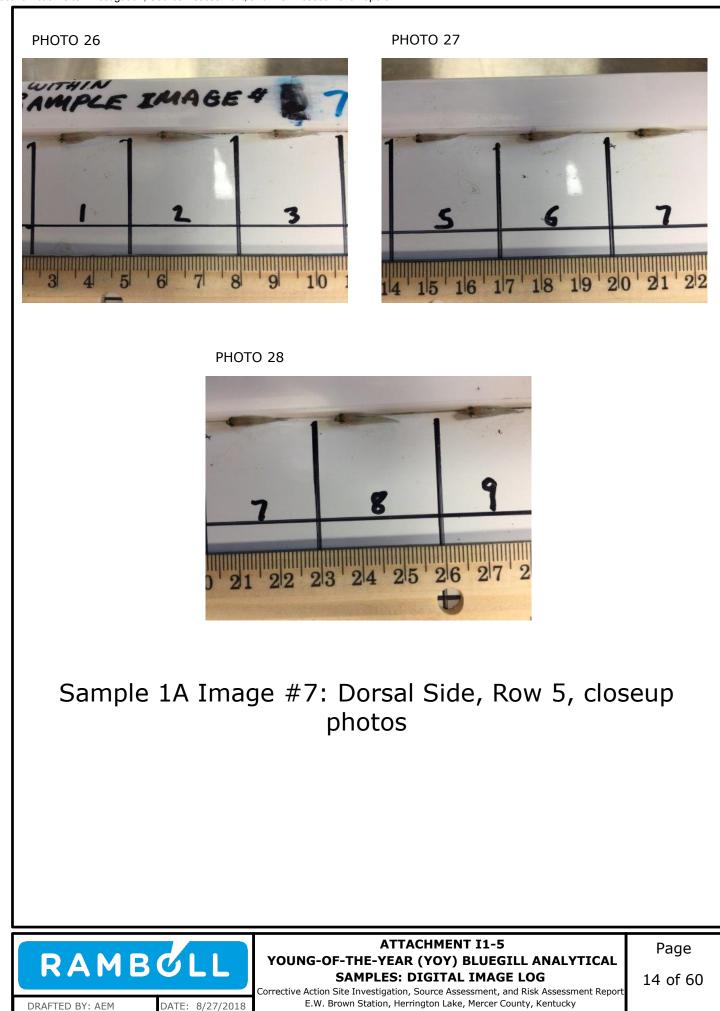


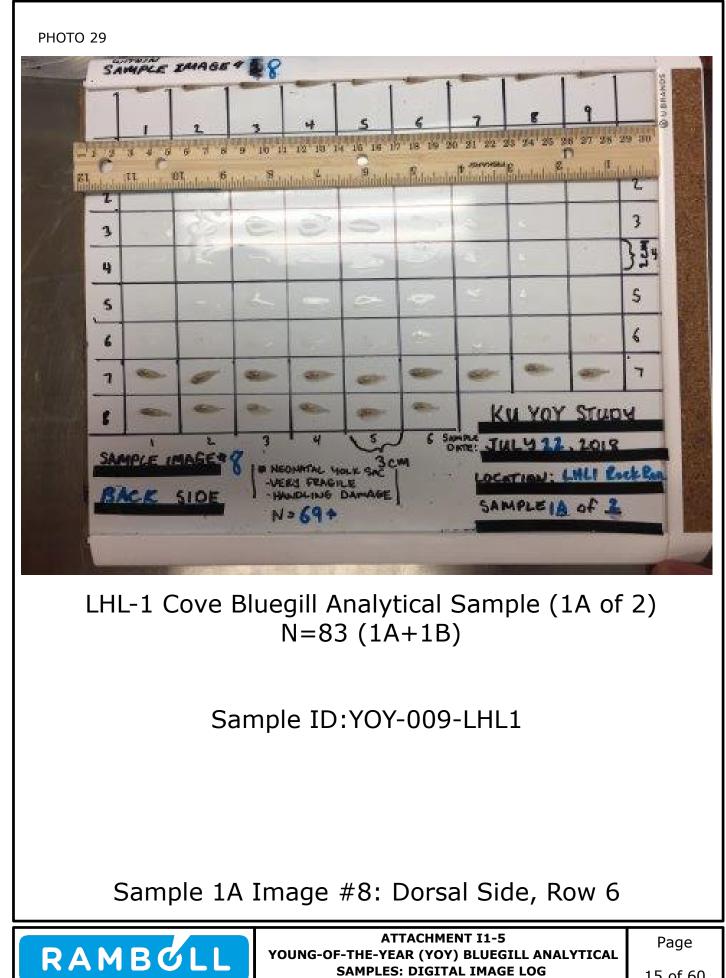
SAMPLES: DIGITAL IMAGE LOG Corrective Action Site Investigation, Source Assessment, and Risk Assessment Report E.W. Brown Station, Herrington Lake, Mercer County, Kentucky

**ATTACHMENT I1-5** 

YOUNG-OF-THE-YEAR (YOY) BLUEGILL ANALYTICAL

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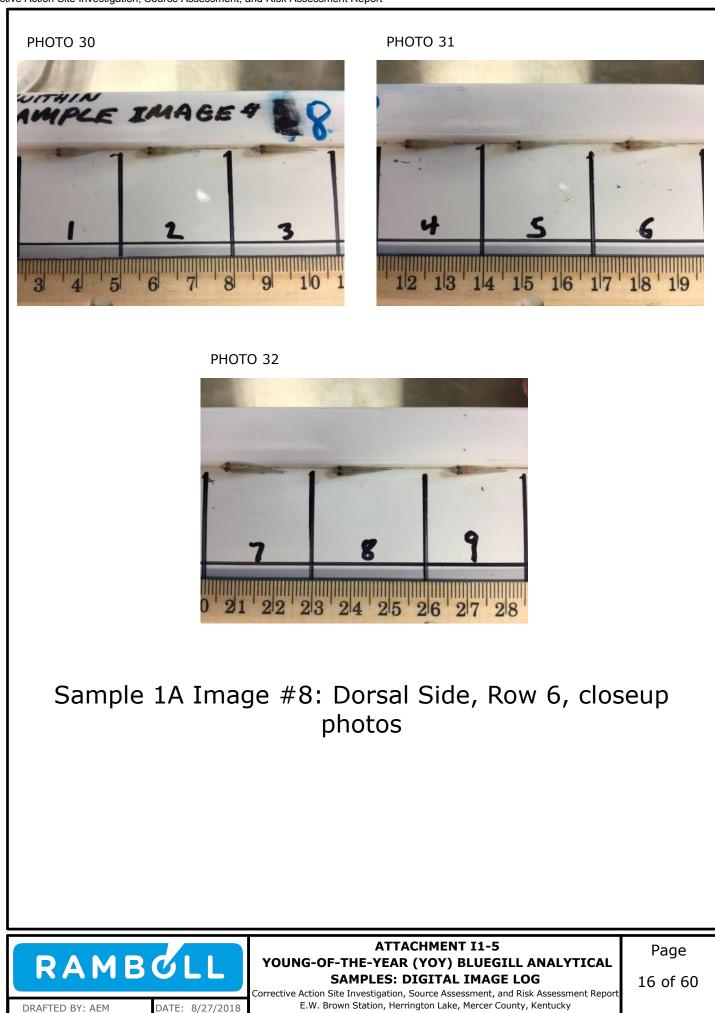




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DATE: 8/27/2018

Corrective Action Site Investigation, Source Assessment, and Risk Assessment Report E.W. Brown Station, Herrington Lake, Mercer County, Kentucky



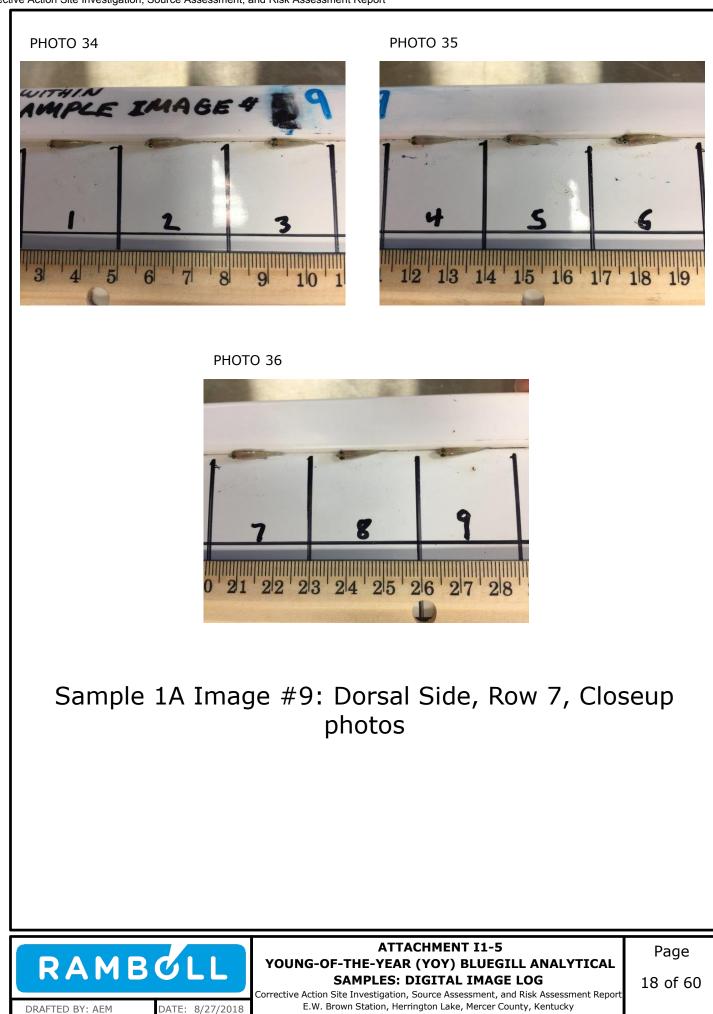
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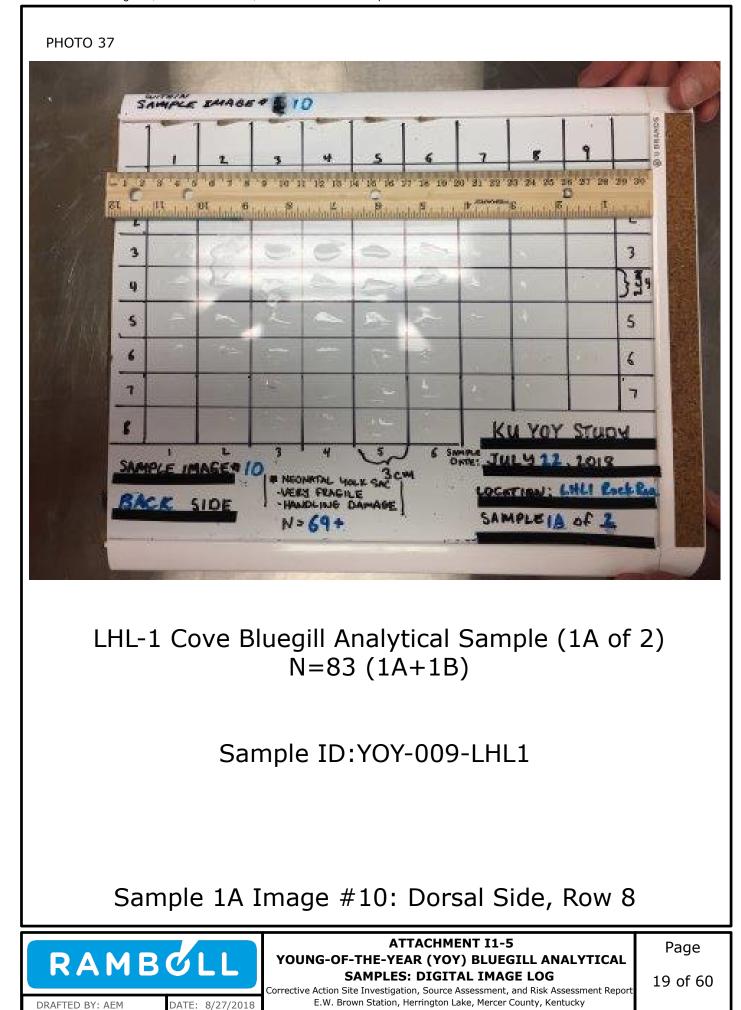
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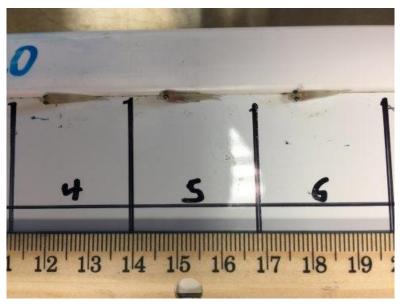
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Sample 1A Image #10: Dorsal Side, Row 8, closeup photos



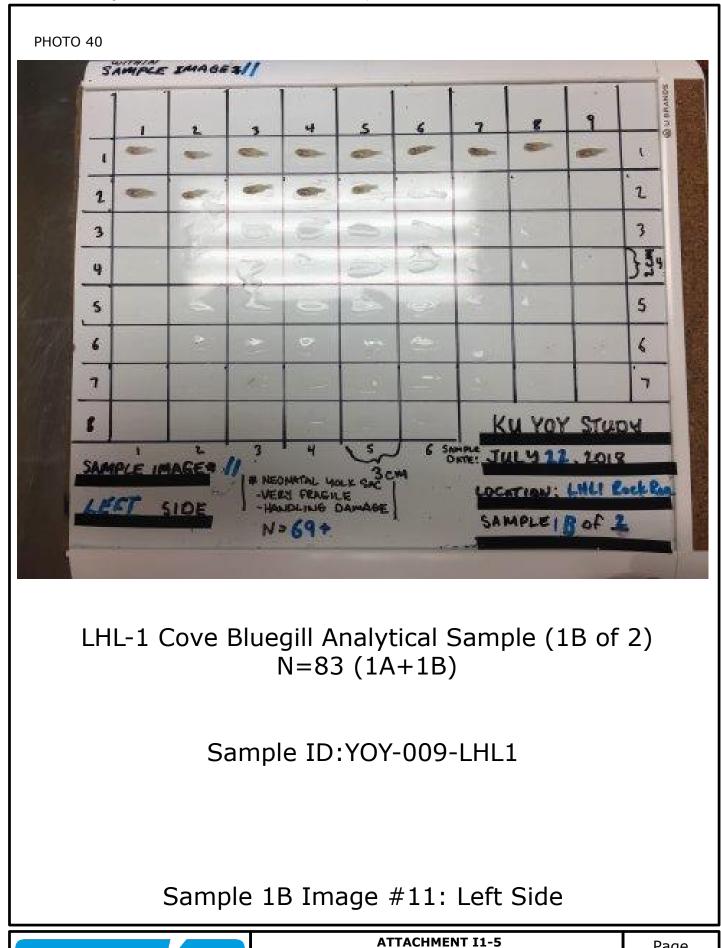
DATE: 8/27/2018

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ATTACHMENT I1-5 YOUNG-OF-THE-YEAR (YOY) BLUEGILL ANALYTICAL SAMPLES: DIGITAL IMAGE LOG Corrective Action Site Investigation, Source Assessment, and Risk Assessment Report

E.W. Brown Station, Herrington Lake, Mercer County, Kentucky

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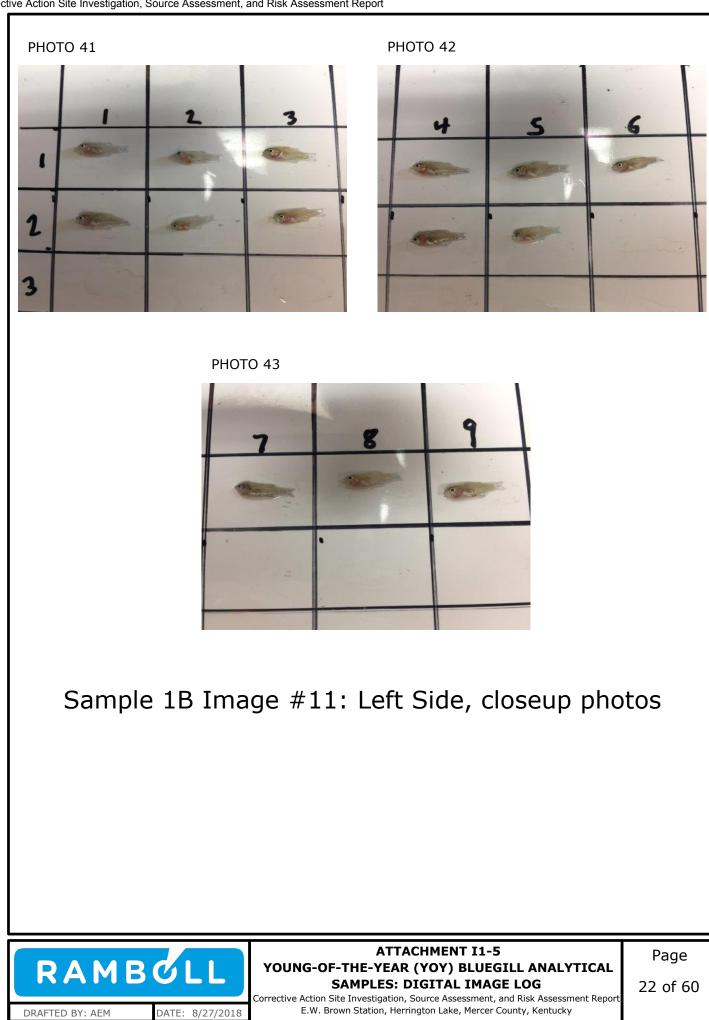


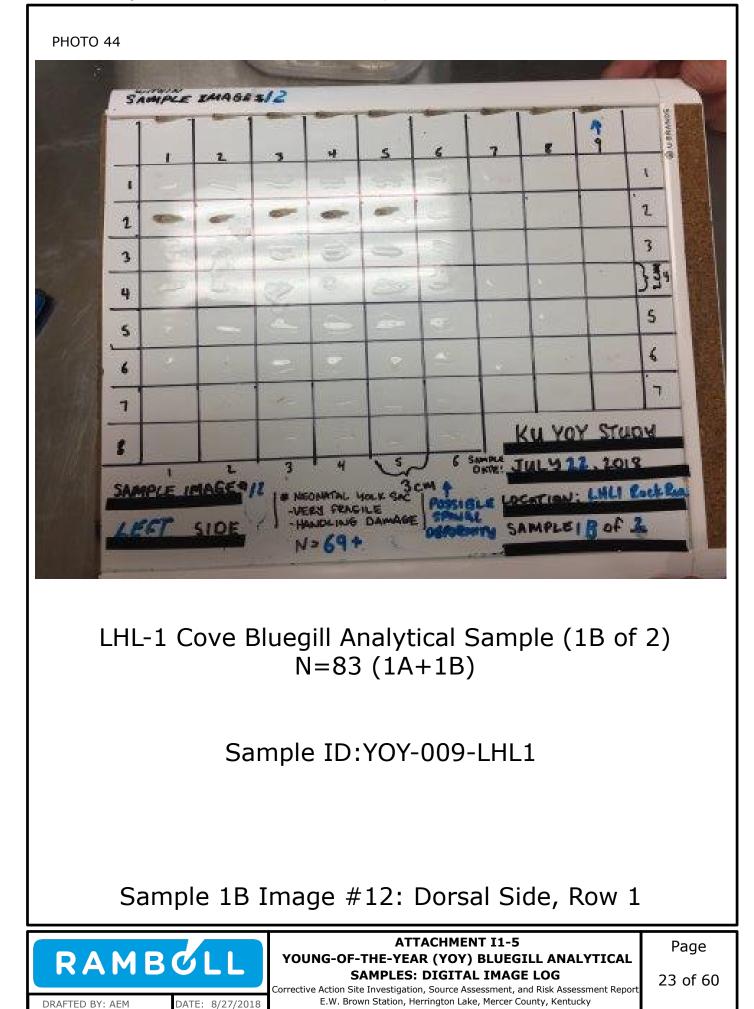


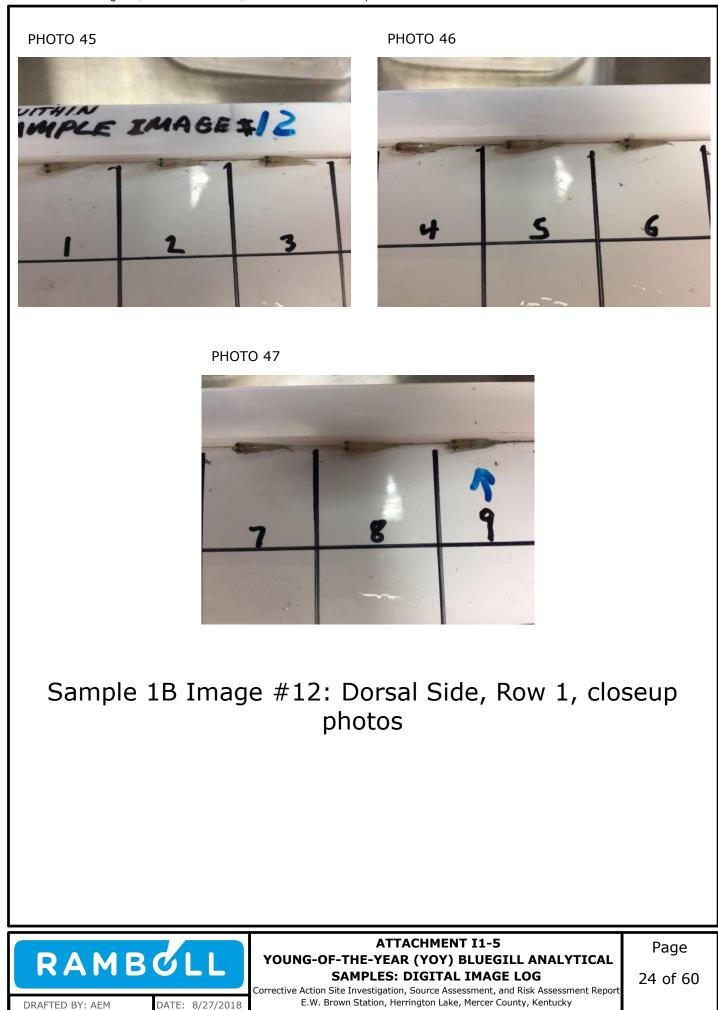
SAMPLES: DIGITAL IMAGE LOG Corrective Action Site Investigation, Source Assessment, and Risk Assessment Report E.W. Brown Station, Herrington Lake, Mercer County, Kentucky

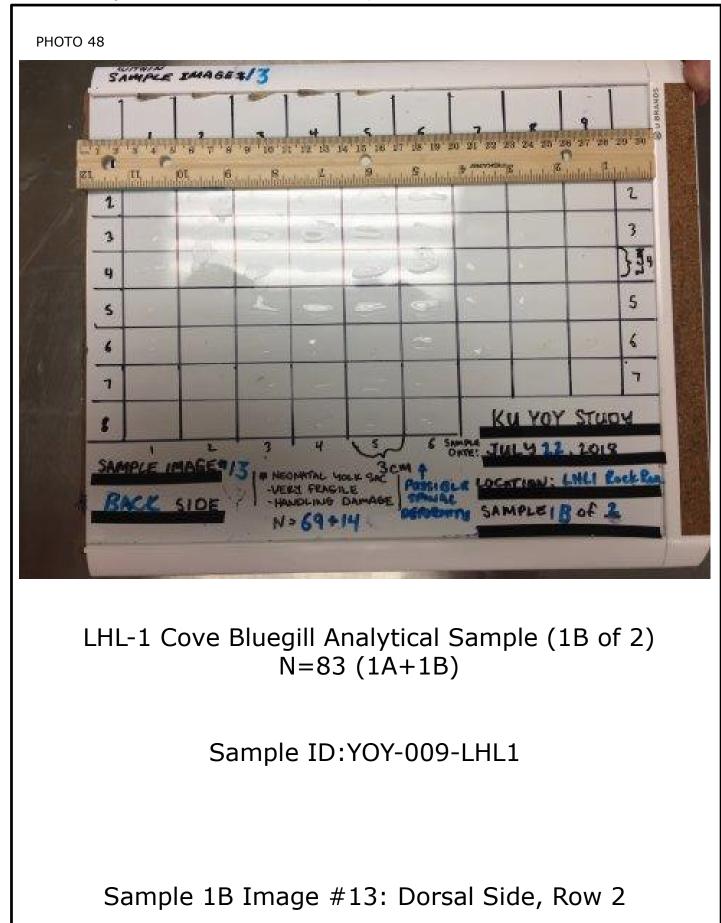
YOUNG-OF-THE-YEAR (YOY) BLUEGILL ANALYTICAL

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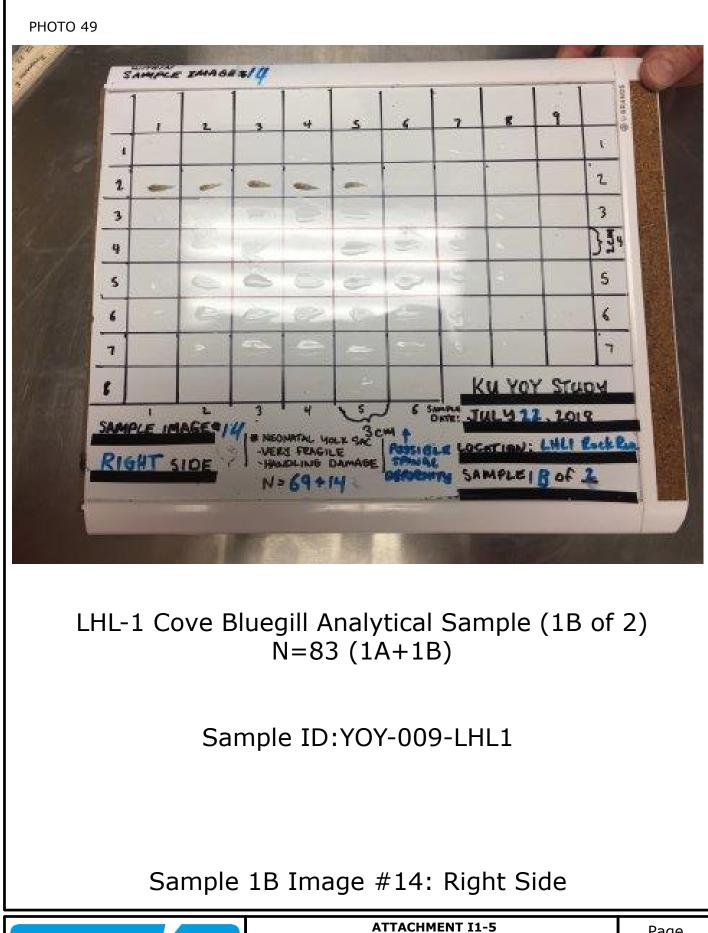






ATTACHMENT I1-5 YOUNG-OF-THE-YEAR (YOY) BLUEGILL ANALYTICAL SAMPLES: DIGITAL IMAGE LOG Corrective Action Site Investigation, Source Assessment, and Risk Assessment Report E.W. Brown Station, Herrington Lake, Mercer County, Kentucky

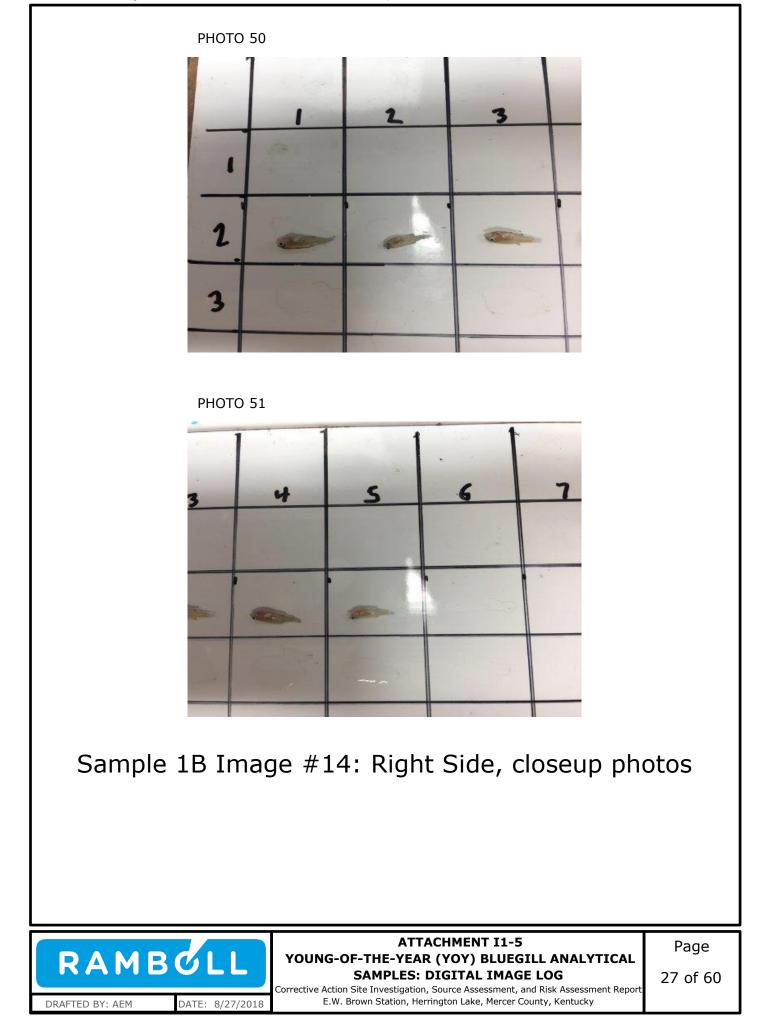
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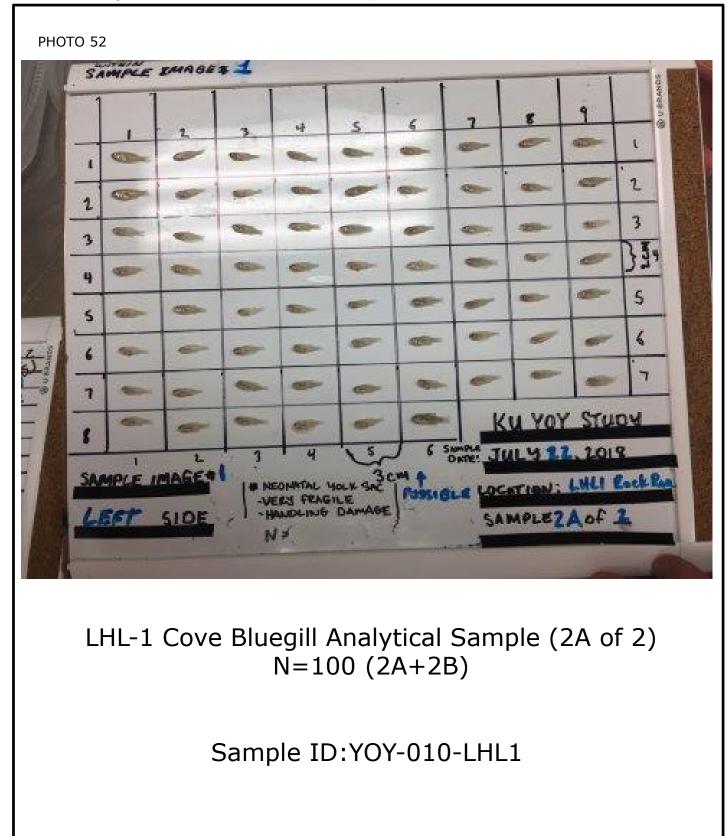


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## Sample 2A Image #1: Left Side



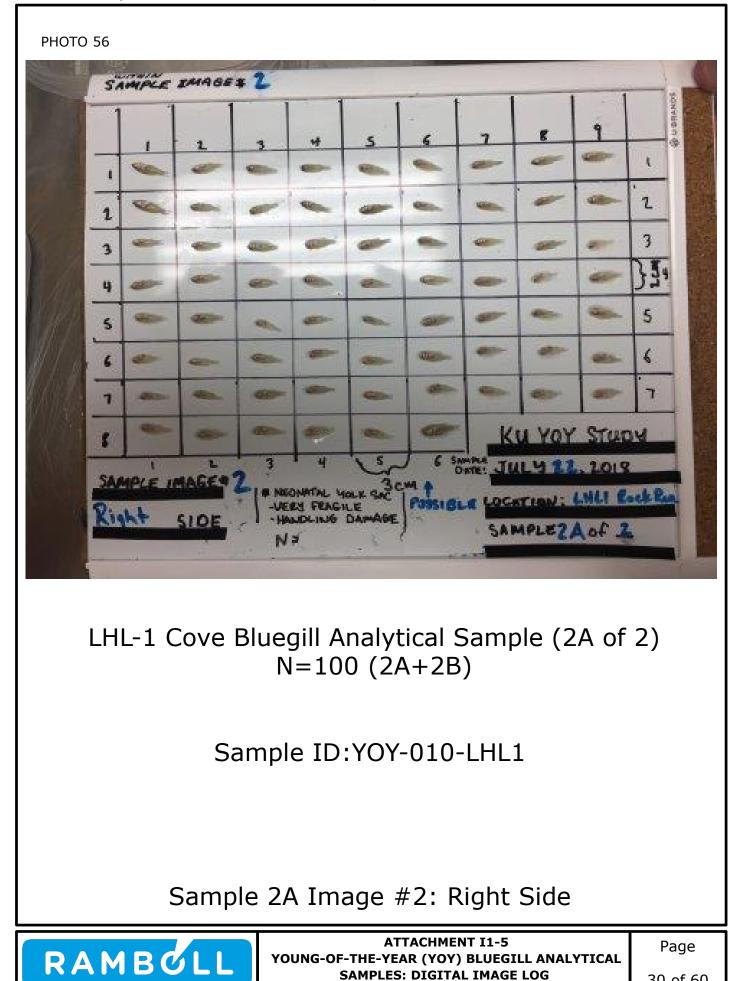
ATTACHMENT I1-5 YOUNG-OF-THE-YEAR (YOY) BLUEGILL ANALYTICAL SAMPLES: DIGITAL IMAGE LOG Corrective Action Site Investigation, Source Assessment, and Risk Assessment Report E.W. Brown Station, Herrington Lake, Mercer County, Kentucky

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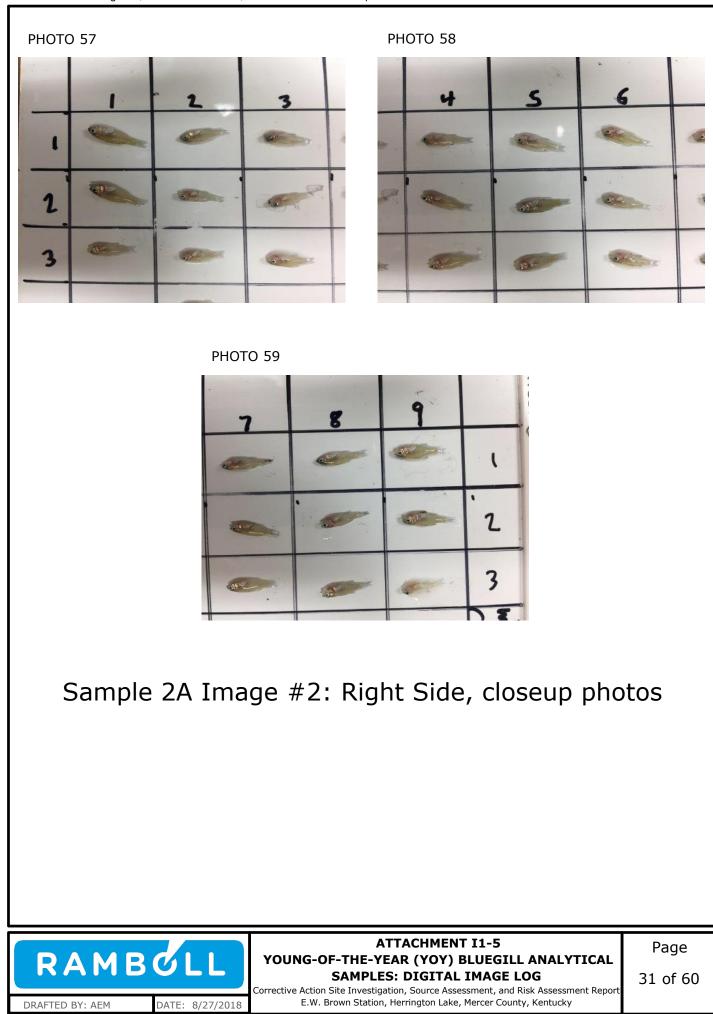
SAMPLES: DIGITAL IMAGE LOG Corrective Action Site Investigation, Source Assessment, and Risk Assessment Report E.W. Brown Station, Herrington Lake, Mercer County, Kentucky

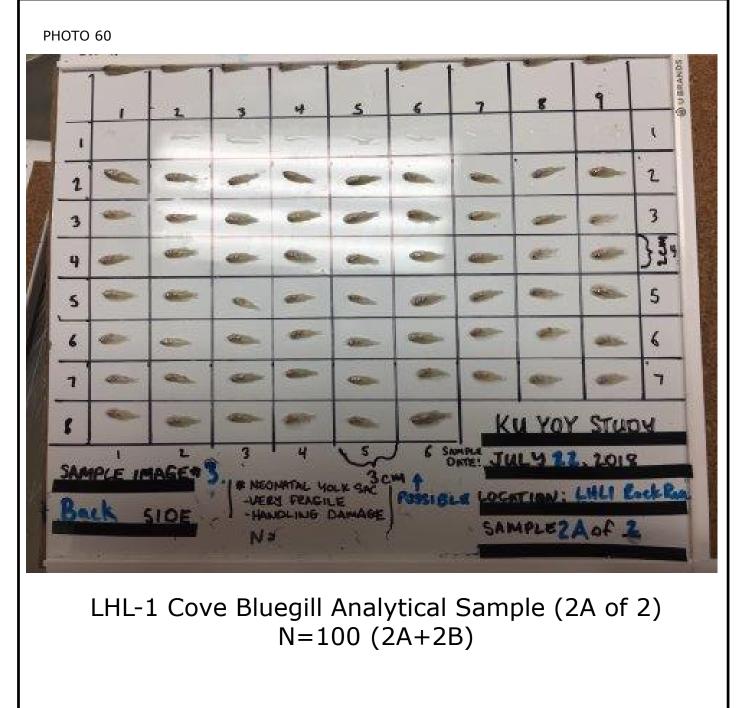


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DATE: 8/27/2018

Corrective Action Site Investigation, Source Assessment, and Risk Assessment Report E.W. Brown Station, Herrington Lake, Mercer County, Kentucky





## Sample ID:YOY-010-LHL1

## Sample 2A Image #3: Dorsal Side, Row 1



YOUNG-OF-THE-YEAR (YOY) BLUEGILL ANALYTICAL SAMPLES: DIGITAL IMAGE LOG Corrective Action Site Investigation, Source Assessment, and Risk Assessment Report E.W. Brown Station, Herrington Lake, Mercer County, Kentucky

**ATTACHMENT I1-5** 

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**PHOTO 62** 



PHOTO 63



Sample 2A Image #3: Dorsal Side, Row 1



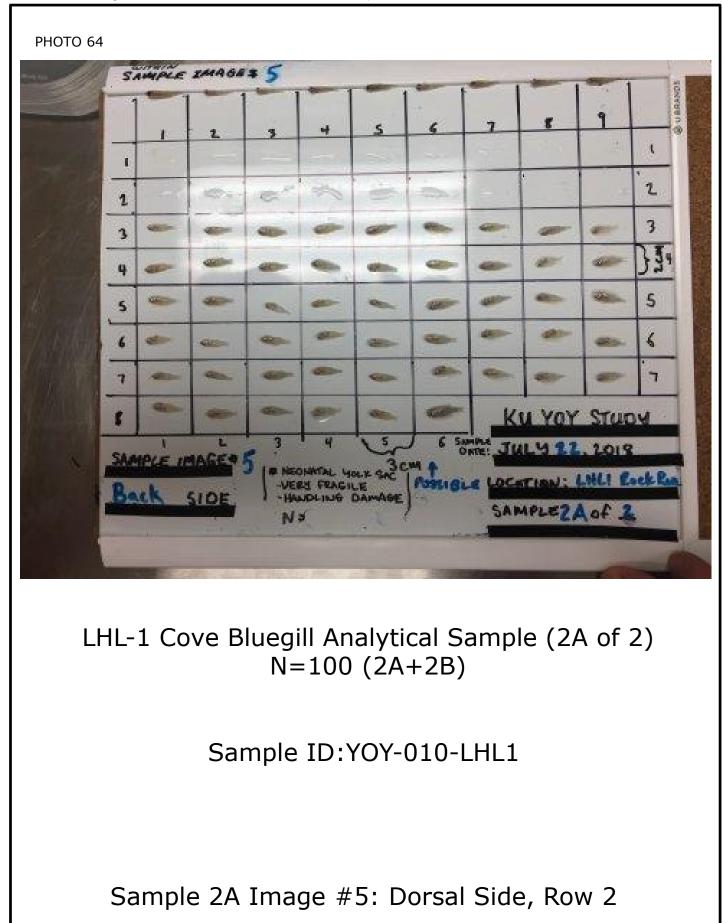
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DATE: 8/27/2018

ATTACHMENT I1-5 YOUNG-OF-THE-YEAR (YOY) BLUEGILL ANALYTICAL SAMPLES: DIGITAL IMAGE LOG Corrective Action Site Investigation, Source Assessment, and Risk Assessment Report

E.W. Brown Station, Herrington Lake, Mercer County, Kentucky

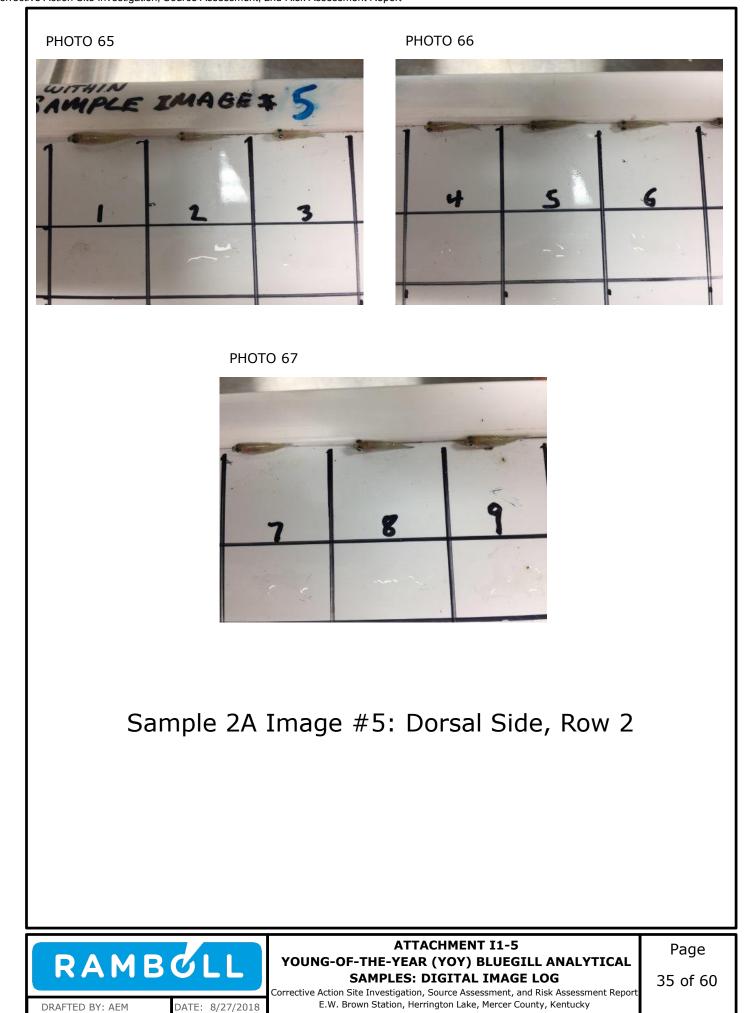
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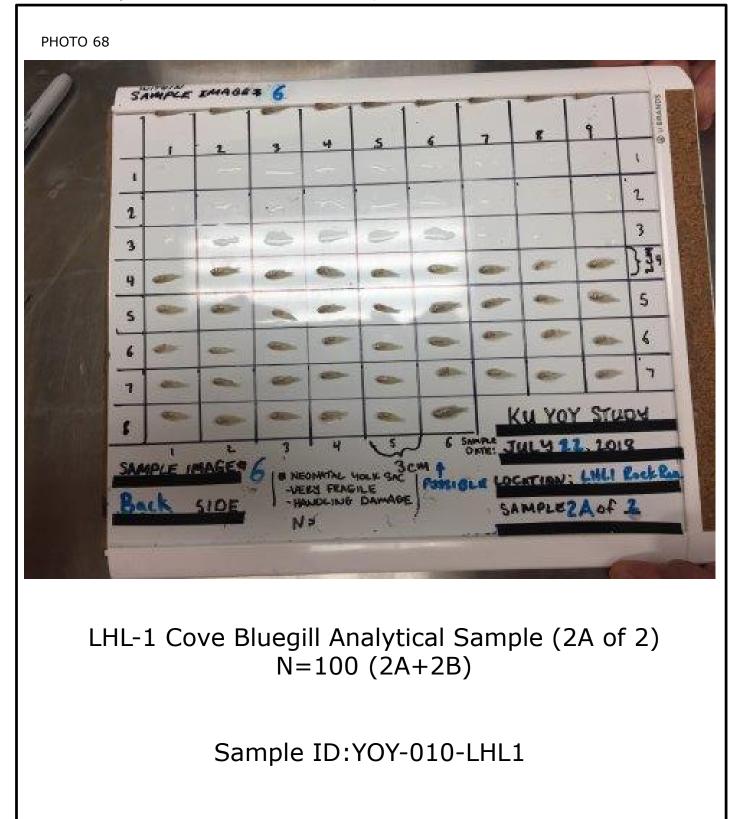




ATTACHMENT I1-5 YOUNG-OF-THE-YEAR (YOY) BLUEGILL ANALYTICAL SAMPLES: DIGITAL IMAGE LOG Corrective Action Site Investigation, Source Assessment, and Risk Assessment Report E.W. Brown Station, Herrington Lake, Mercer County, Kentucky

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Sample 2A Image #6: Dorsal Side, Row 3

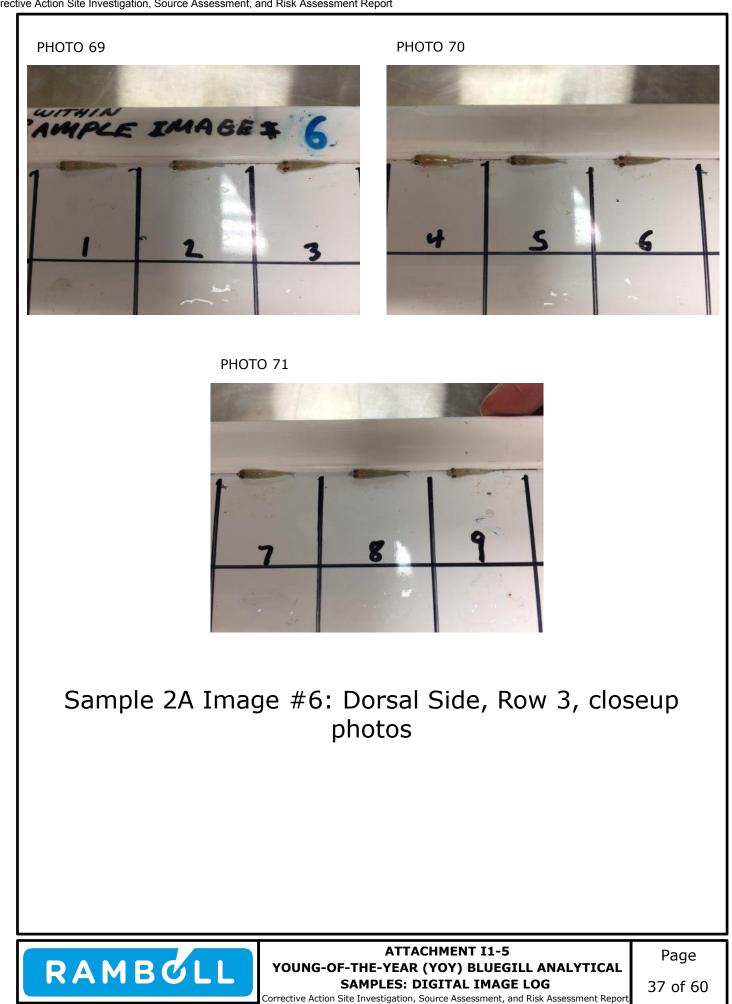


ATTACHMENT I1-5 YOUNG-OF-THE-YEAR (YOY) BLUEGILL ANALYTICAL SAMPLES: DIGITAL IMAGE LOG Corrective Action Site Investigation, Source Assessment, and Risk Assessment Report E.W. Brown Station, Herrington Lake, Mercer County, Kentucky

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DATE: 8/27/2018

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E.W. Brown Station, Herrington Lake, Mercer County, Kentucky

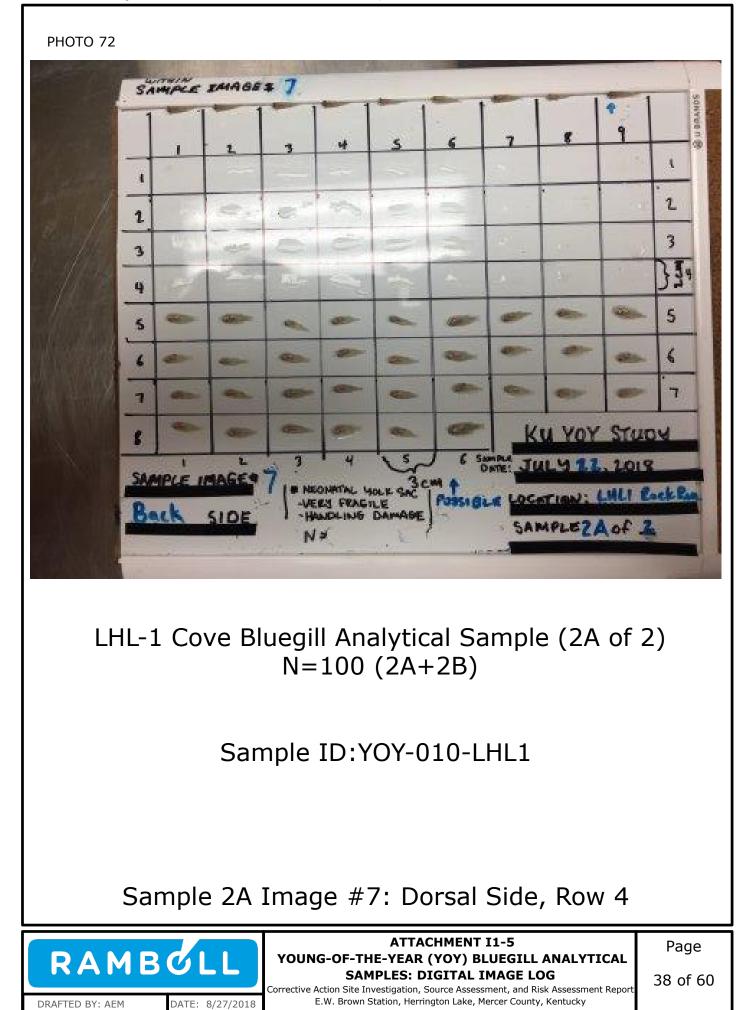




PHOTO 74







Sample 2A Image #7: Dorsal Side, Row 4, closeup photos



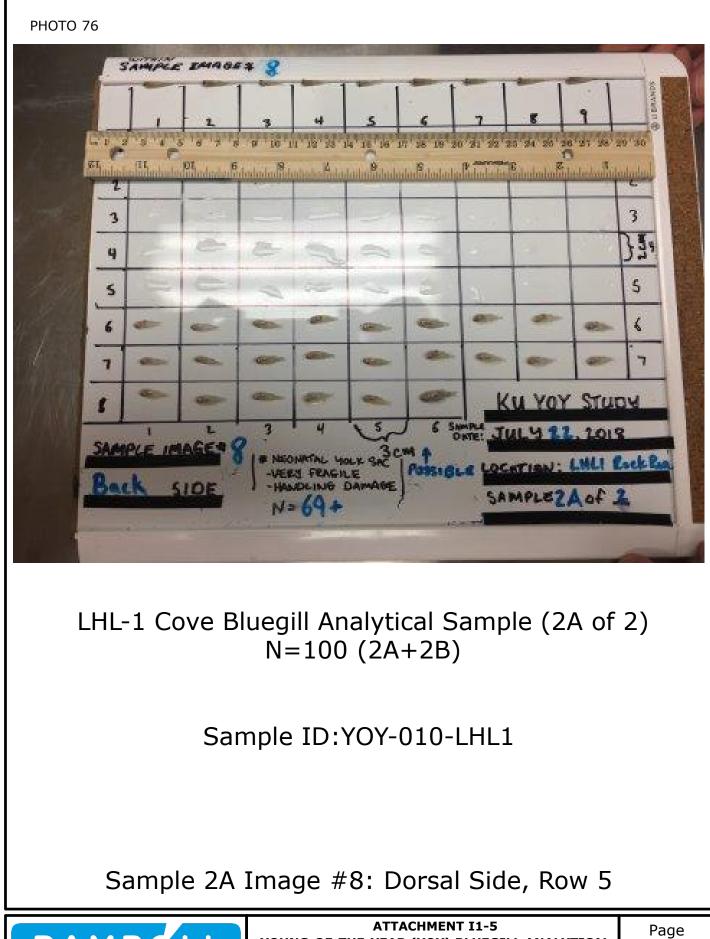
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DATE: 8/27/2018

ATTACHMENT I1-5 YOUNG-OF-THE-YEAR (YOY) BLUEGILL ANALYTICAL SAMPLES: DIGITAL IMAGE LOG Corrective Action Site Investigation, Source Assessment, and Risk Assessment Report

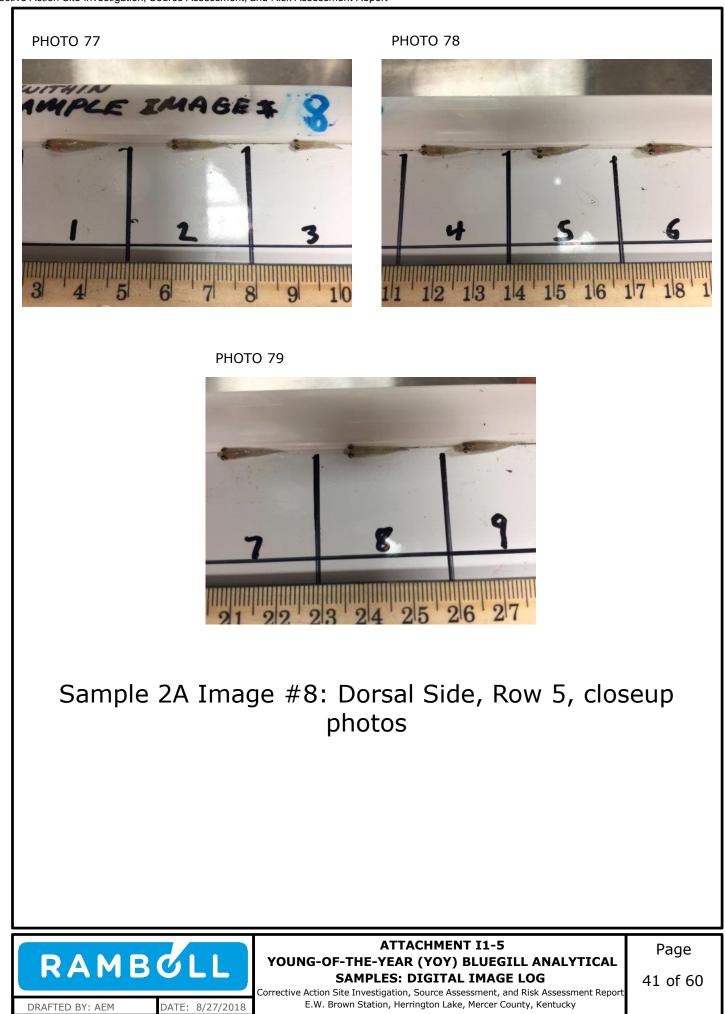
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YOUNG-OF-THE-YEAR (YOY) BLUEGILL ANALYTICAL SAMPLES: DIGITAL IMAGE LOG Corrective Action Site Investigation, Source Assessment, and Risk Assessment Report E.W. Brown Station, Herrington Lake, Mercer County, Kentucky

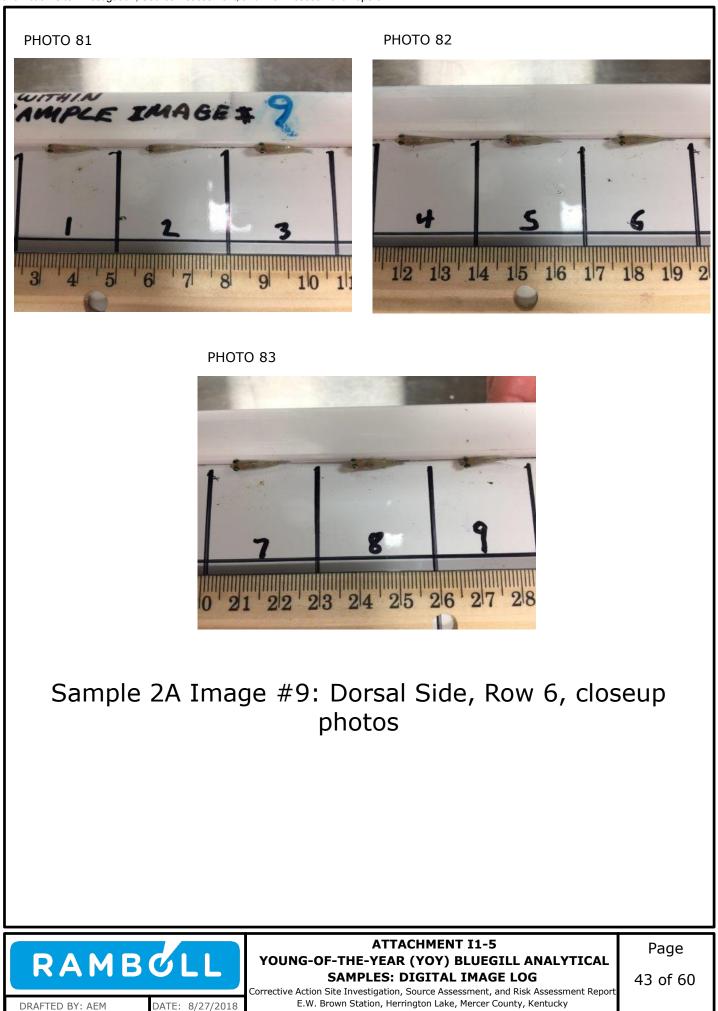


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ATTACHMENT 11-5 YOUNG-OF-THE-YEAR (YOY) BLUEGILL ANALYTICAL SAMPLES: DIGITAL IMAGE LOG Corrective Action Site Investigation, Source Assessment, and Risk Assessment Report E.W. Brown Station, Herrington Lake, Mercer County, Kentucky

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ATTACHMENT I1-5 YOUNG-OF-THE-YEAR (YOY) BLUEGILL ANALYTICAL SAMPLES: DIGITAL IMAGE LOG Corrective Action Site Investigation, Source Assessment, and Risk Assessment Report E.W. Brown Station, Herrington Lake, Mercer County, Kentucky

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**PHOTO 87** 



**PHOTO 86** 

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Sample 2A Image #10: Dorsal Side, Row 7, closeup photos



ATTACHMENT I1-5 YOUNG-OF-THE-YEAR (YOY) BLUEGILL ANALYTICAL SAMPLES: DIGITAL IMAGE LOG Corrective Action Site Investigation, Source Assessment, and Risk Assessment Report

E.W. Brown Station, Herrington Lake, Mercer County, Kentucky

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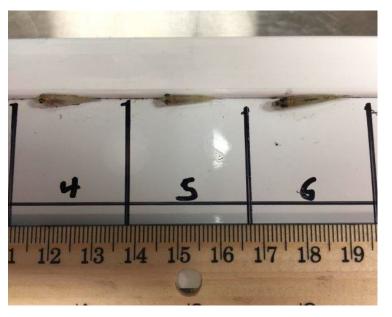
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E.W. Brown Station, Herrington Lake, Mercer County, Kentucky



**РНОТО 90** 



Sample 2A Image #11: Dorsal Side, Row 8, closeup photos



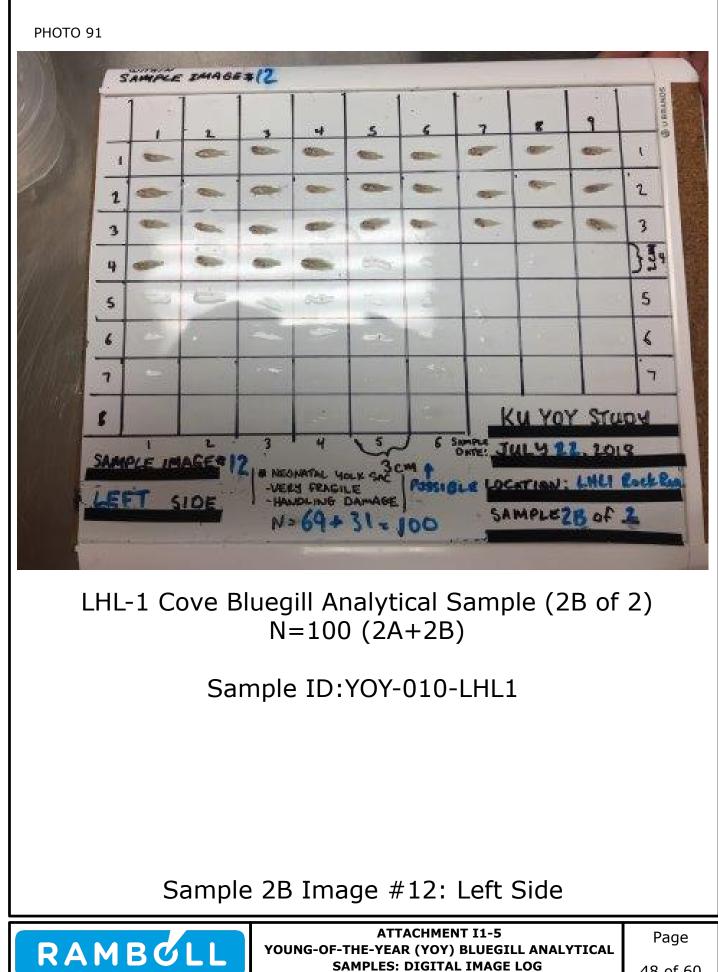
DATE: 8/27/2018

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ATTACHMENT I1-5 YOUNG-OF-THE-YEAR (YOY) BLUEGILL ANALYTICAL SAMPLES: DIGITAL IMAGE LOG Corrective Action Site Investigation, Source Assessment, and Risk Assessment Report

E.W. Brown Station, Herrington Lake, Mercer County, Kentucky

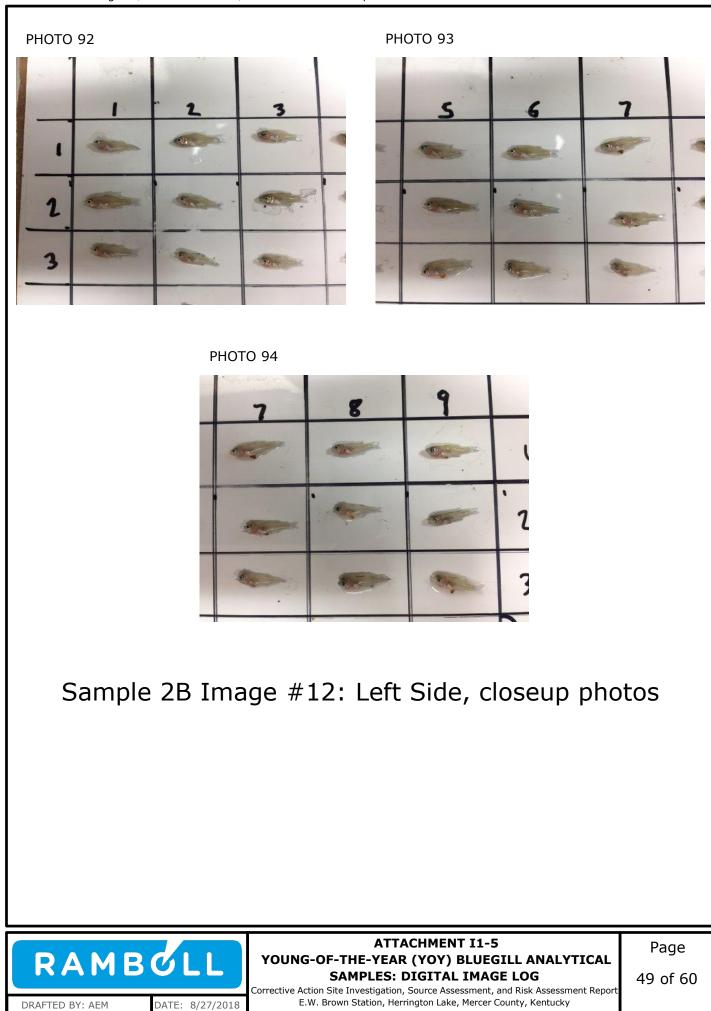
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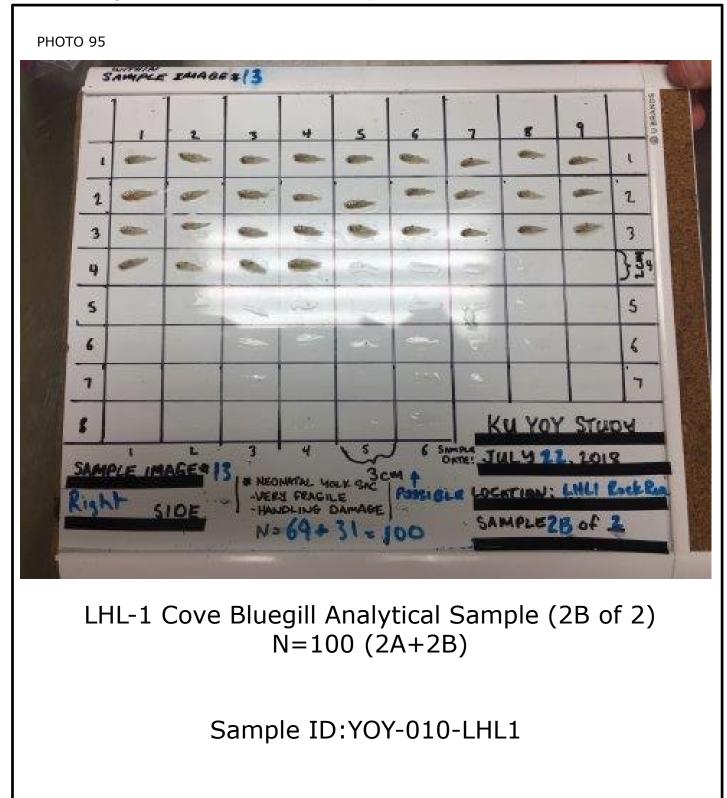


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Corrective Action Site Investigation, Source Assessment, and Risk Assessment Report E.W. Brown Station, Herrington Lake, Mercer County, Kentucky



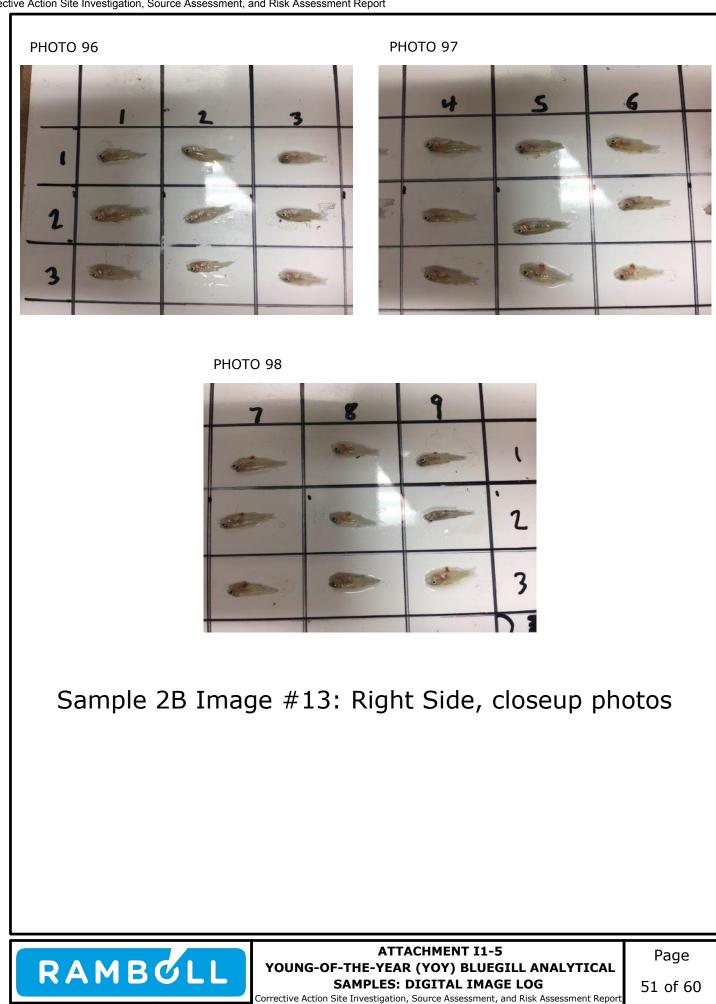


### Sample 2B Image #13: Right Side



ATTACHMENT I1-5 YOUNG-OF-THE-YEAR (YOY) BLUEGILL ANALYTICAL SAMPLES: DIGITAL IMAGE LOG Corrective Action Site Investigation, Source Assessment, and Risk Assessment Report E.W. Brown Station, Herrington Lake, Mercer County, Kentucky

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E.W. Brown Station, Herrington Lake, Mercer County, Kentucky

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DATE: 8/27/2018

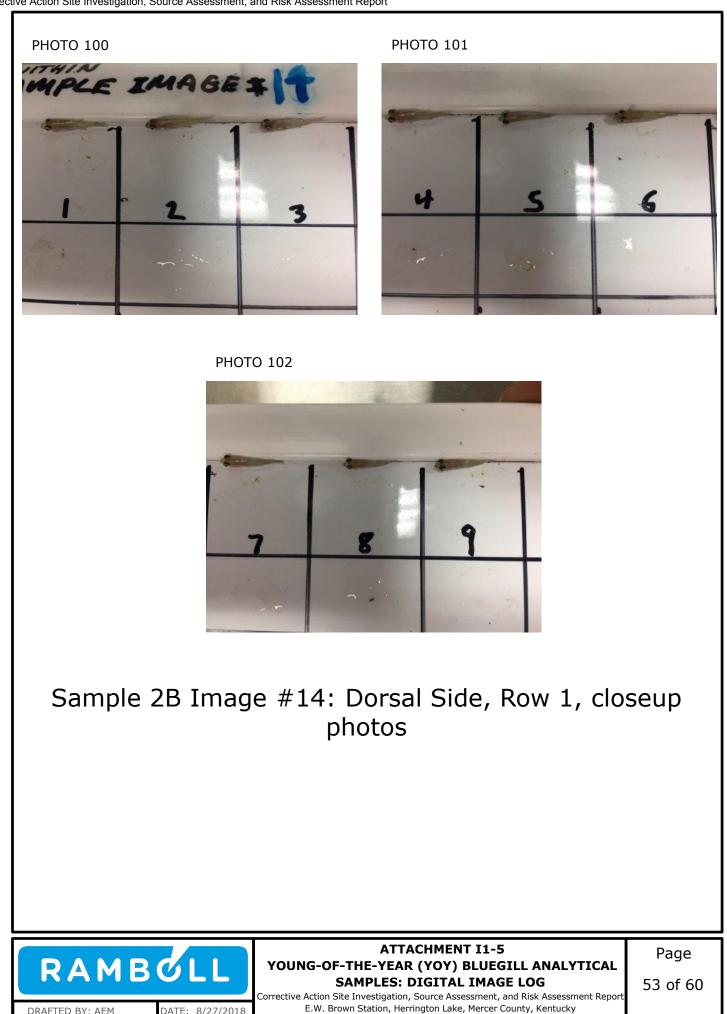
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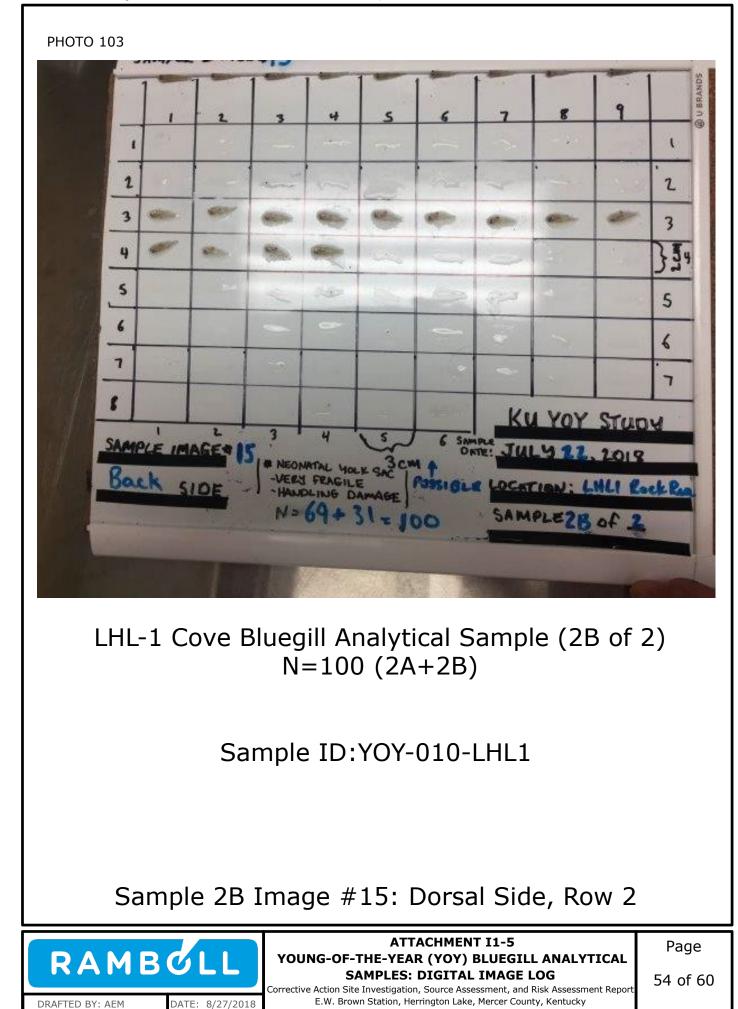
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SAMPLES: DIGITAL IMAGE LOG Corrective Action Site Investigation, Source Assessment, and Risk Assessment Report E.W. Brown Station, Herrington Lake, Mercer County, Kentucky

DATE: 8/27/2018

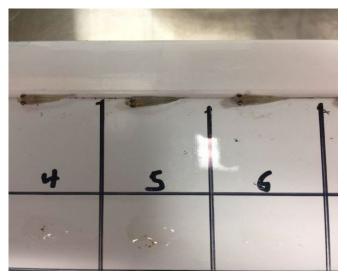
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**PHOTO 105** 







Sample 2B Image #15: Dorsal Side, Row 2, closeup photos



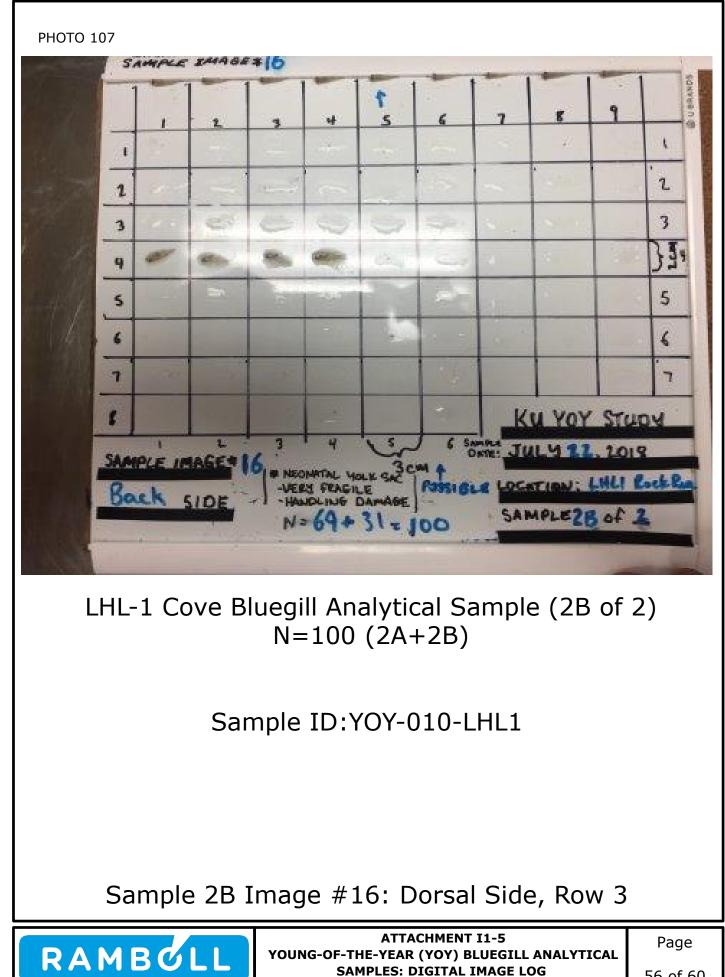
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DATE: 8/27/2018

ATTACHMENT I1-5 YOUNG-OF-THE-YEAR (YOY) BLUEGILL ANALYTICAL SAMPLES: DIGITAL IMAGE LOG Corrective Action Site Investigation, Source Assessment, and Risk Assessment Report

E.W. Brown Station, Herrington Lake, Mercer County, Kentucky

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Corrective Action Site Investigation, Source Assessment, and Risk Assessment Report E.W. Brown Station, Herrington Lake, Mercer County, Kentucky



**PHOTO 110** 



Sample 2B Image #16: Dorsal Side, Row 3, Closeup photos



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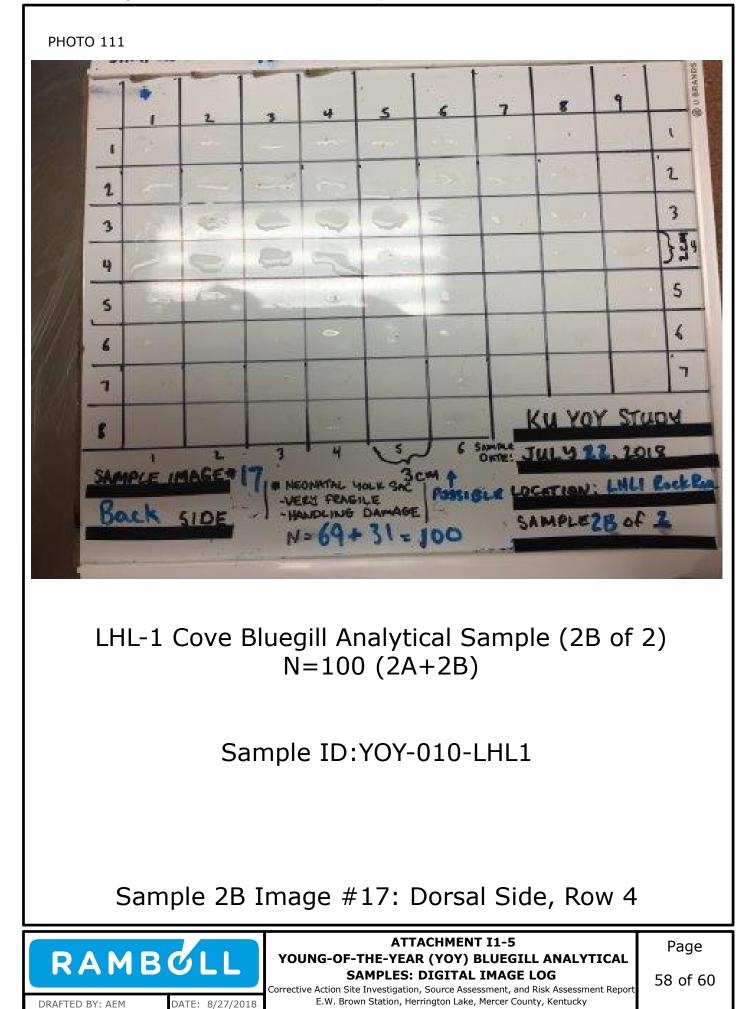
DATE: 8/27/2018

ATTACHMENT I1-5 YOUNG-OF-THE-YEAR (YOY) BLUEGILL ANALYTICAL SAMPLES: DIGITAL IMAGE LOG Corrective Action Site Investigation, Source Assessment, and Risk Assessment Report

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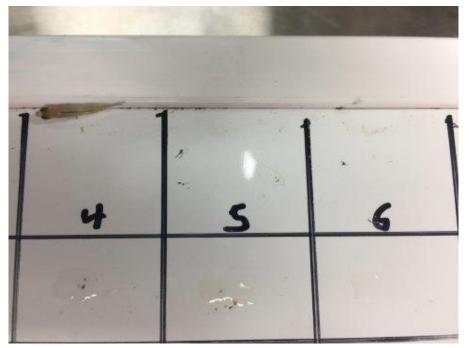
57 of 60

e Action Site Investigation, Source Assessment, and Risk Assessment E.W. Brown Station, Herrington Lake, Mercer County, Kentucky





**PHOTO 113** 



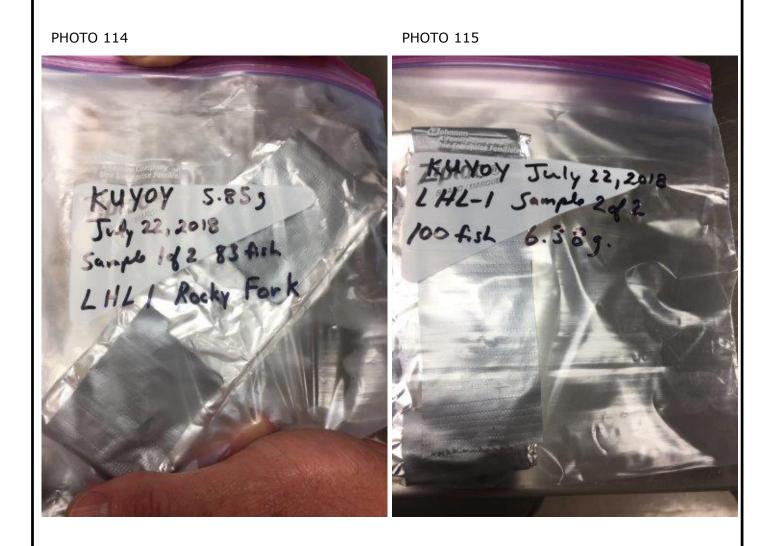
Sample 2B Image #17: Dorsal Side, Row 4, closeup photos



ATTACHMENT I1-5 YOUNG-OF-THE-YEAR (YOY) BLUEGILL ANALYTICAL SAMPLES: DIGITAL IMAGE LOG Corrective Action Site Investigation, Source Assessment, and Risk Assessment Report

E.W. Brown Station, Herrington Lake, Mercer County, Kentucky

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## LHL-1 Cove Bluegill Analytical Sample Bags

Samples 1A, 1B, 2A, 2B

N=183



DATE: 8/27/2018

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YOUNG-OF-THE-YEAR (YOY) BLUEGILL ANALYTICAL SAMPLES: DIGITAL IMAGE LOG Corrective Action Site Investigation, Source Assessment, and Risk Assessment Report E.W. Brown Station, Herrington Lake, Mercer County, Kentucky

**ATTACHMENT I1-5** 

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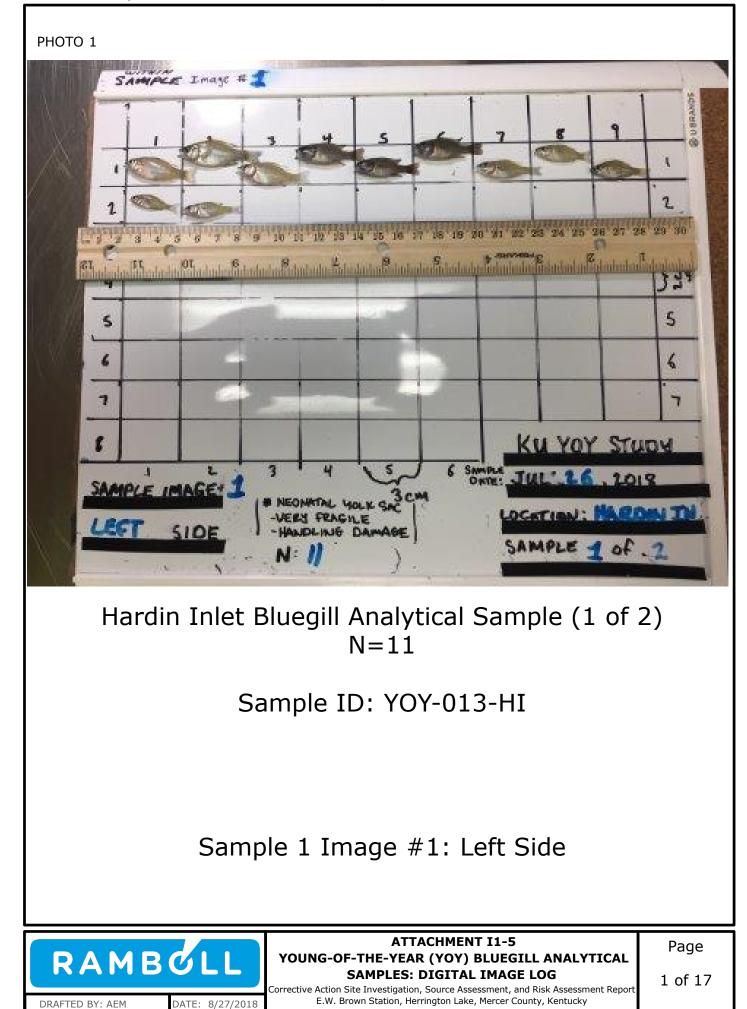
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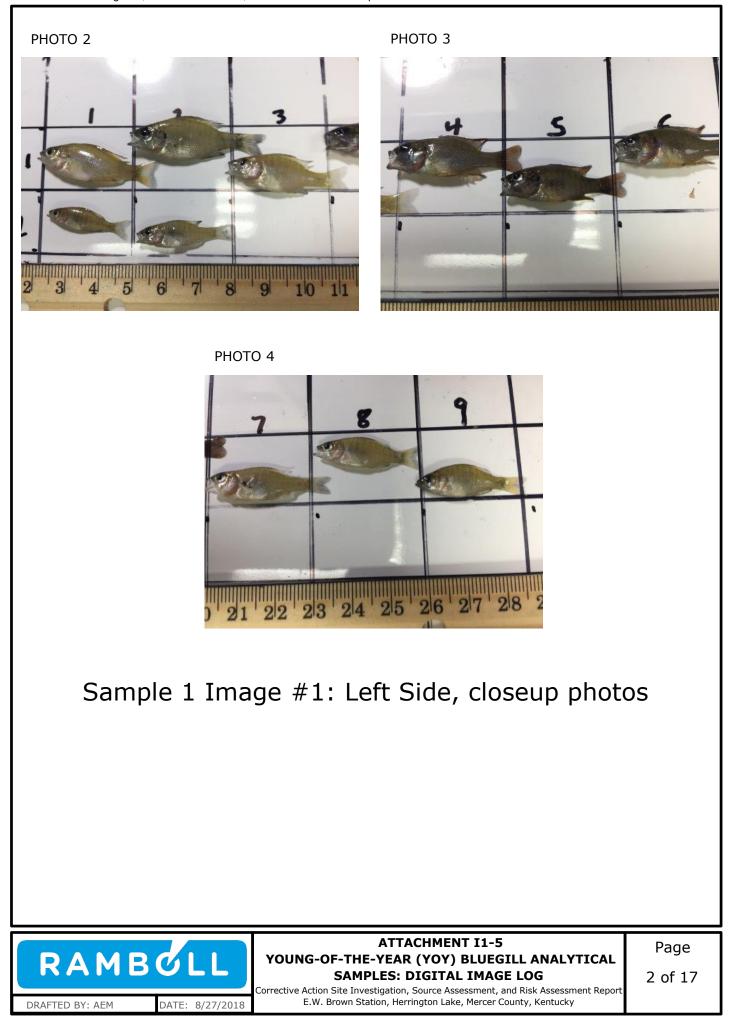
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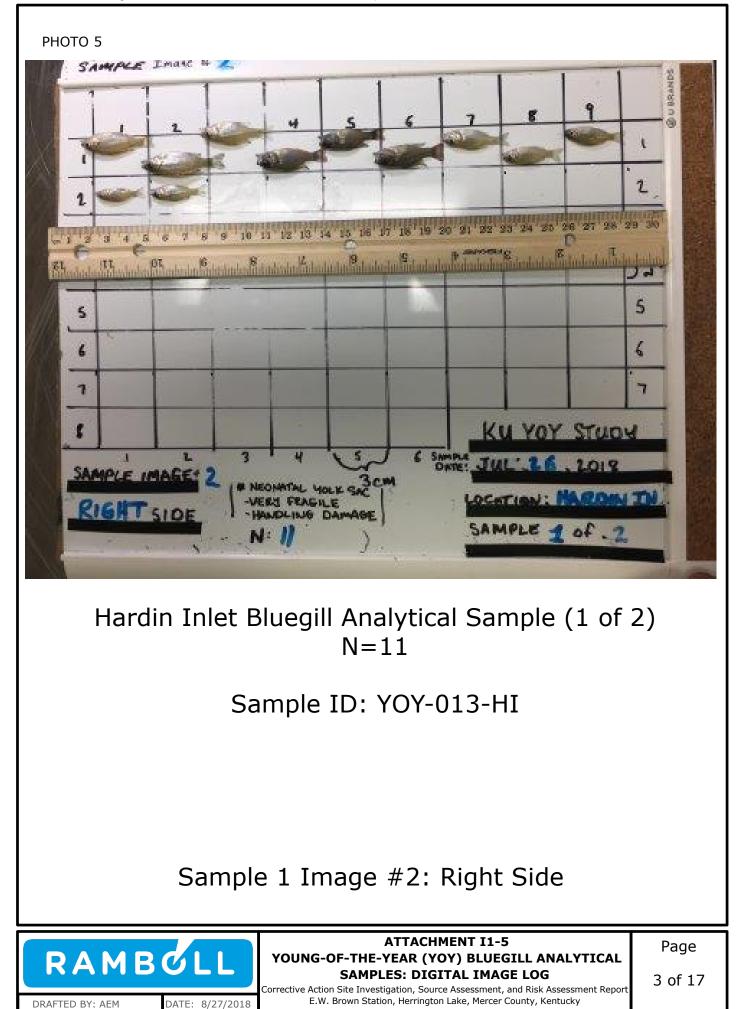
Corrective Action Site Investigation, Source Assessment, and Risk Assessment Report E.W. Brown Station, Herrington Lake, Mercer County, Kentucky

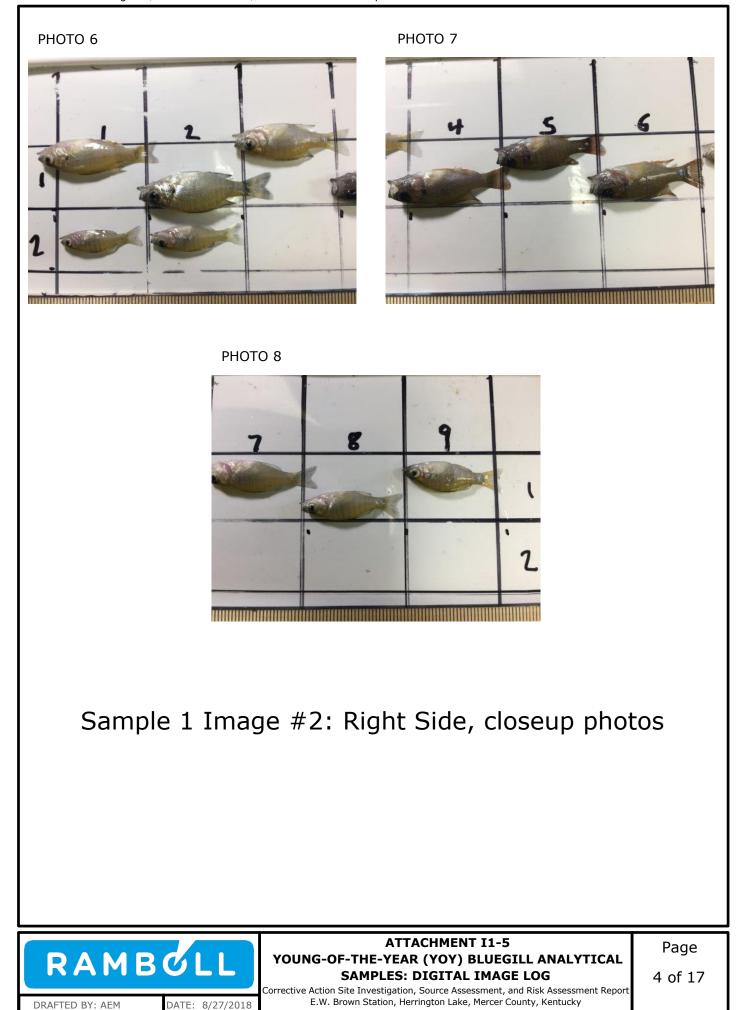
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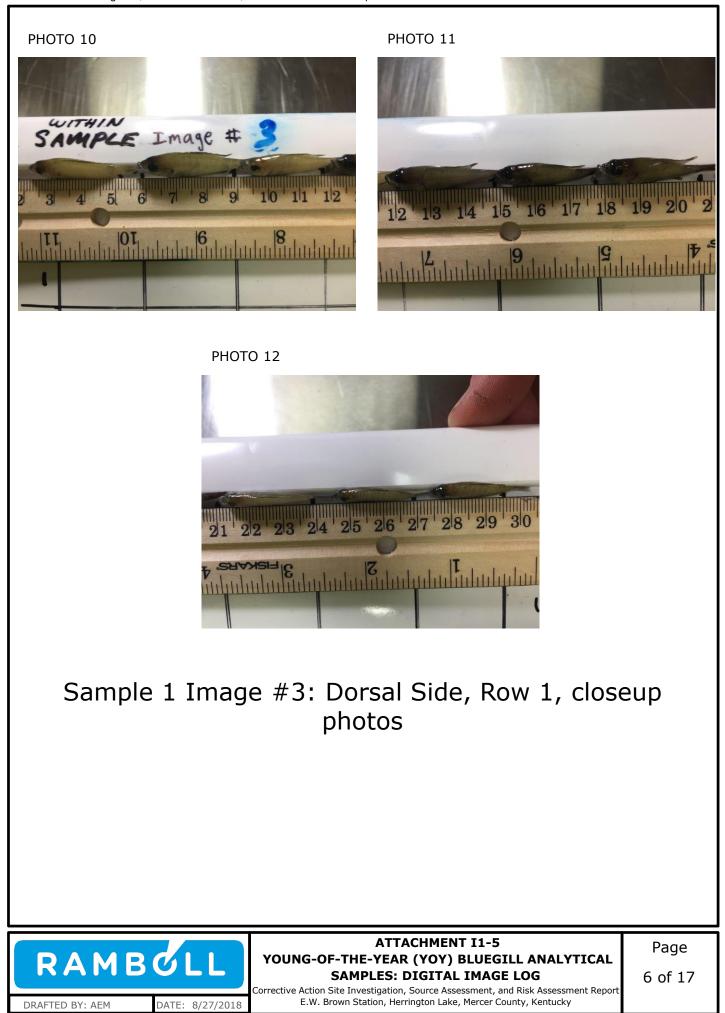


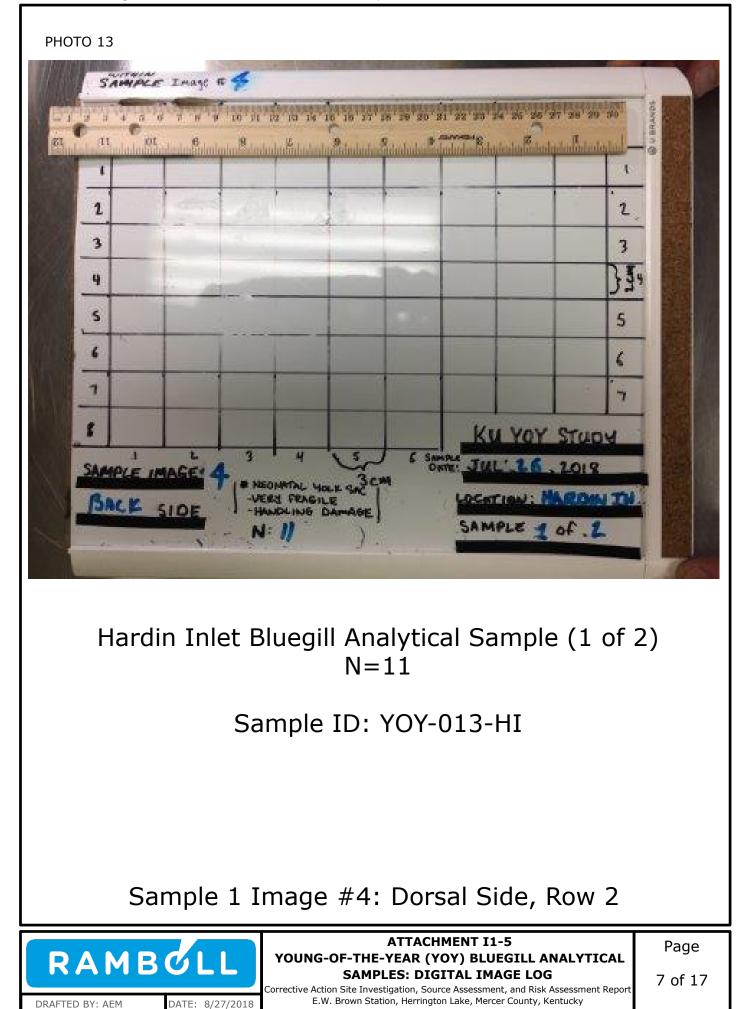
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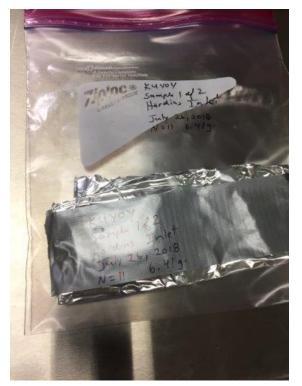
E.W. Brown Station, Herrington Lake, Mercer County, Kentucky







**PHOTO 15** 



Sample 1 Image #4: Dorsal Side, Row 2, closeup photo and Sample 1 bag

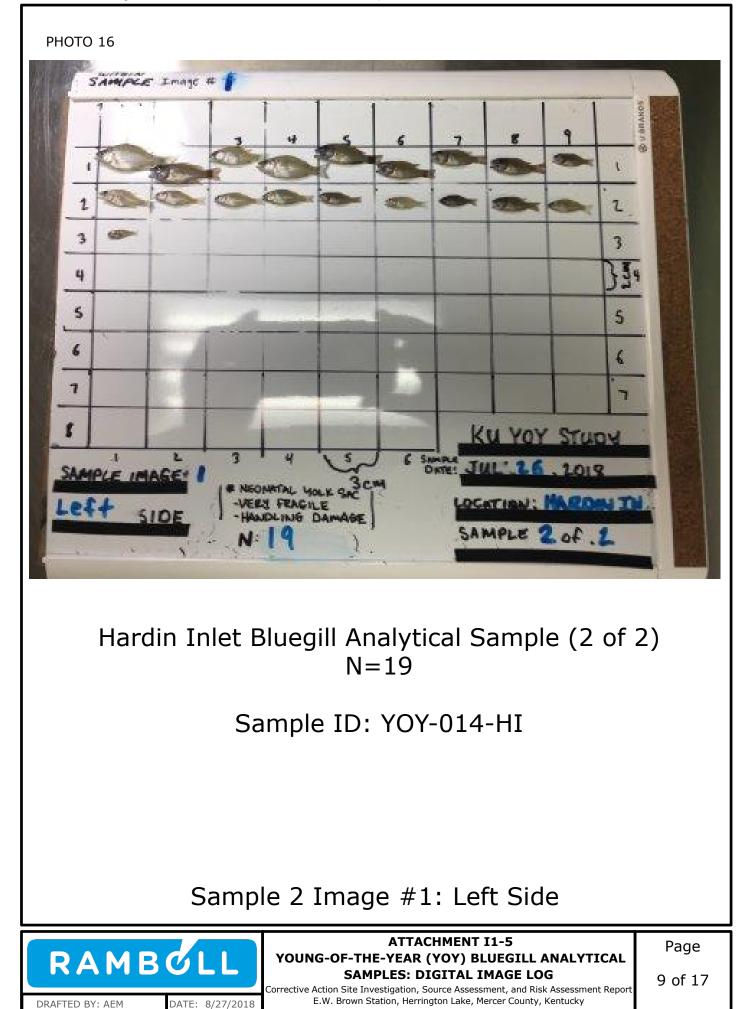


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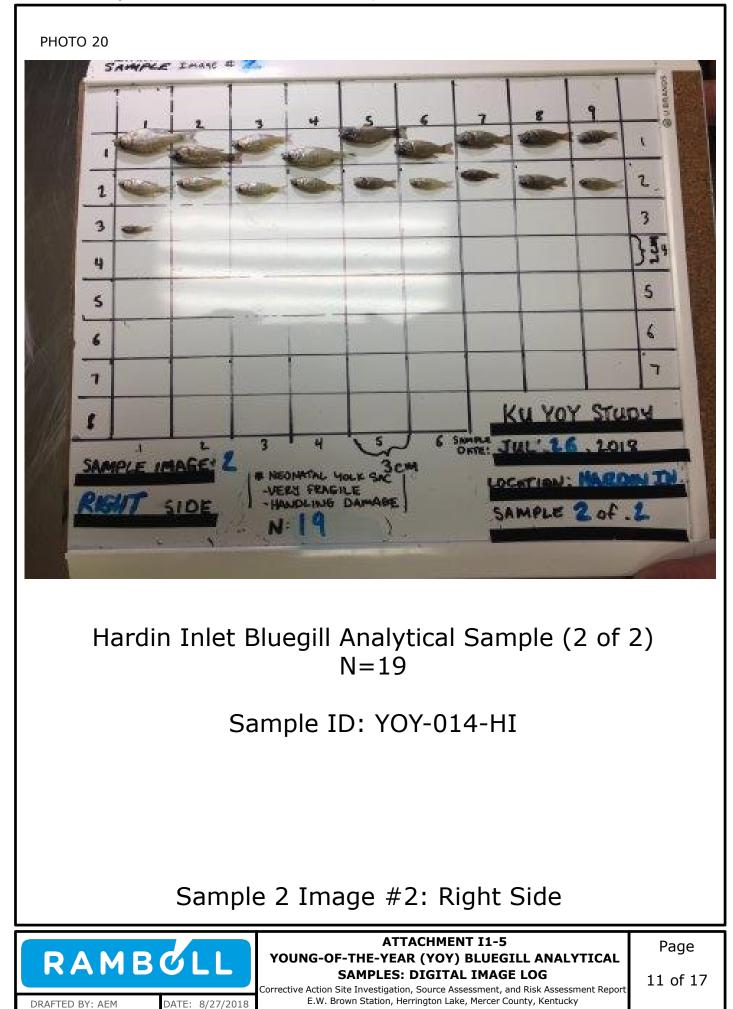
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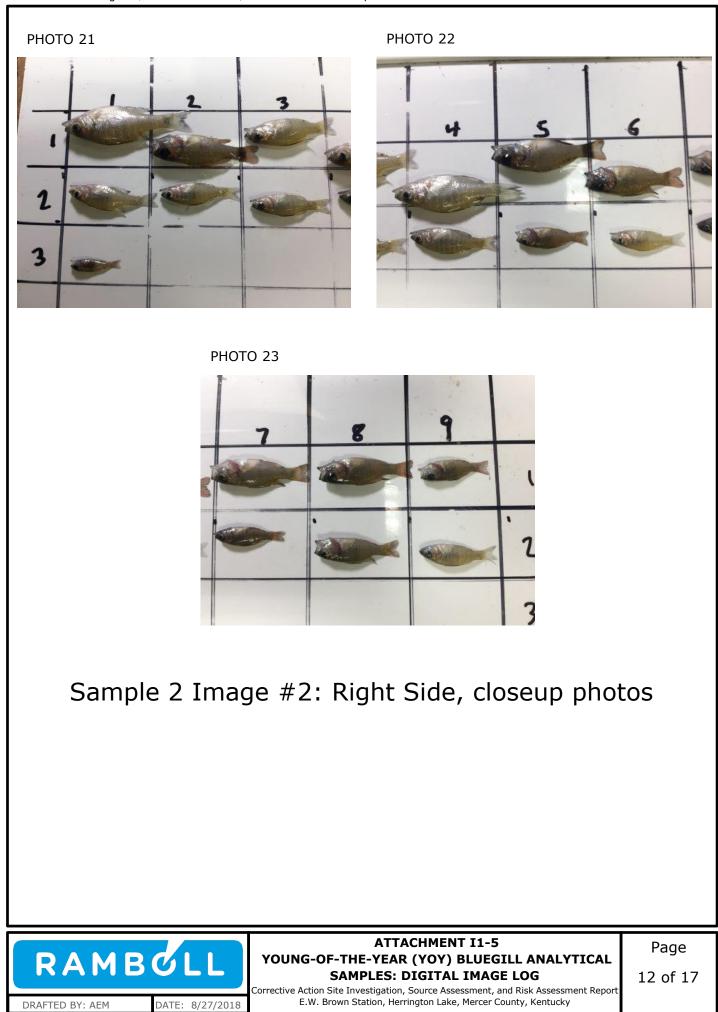
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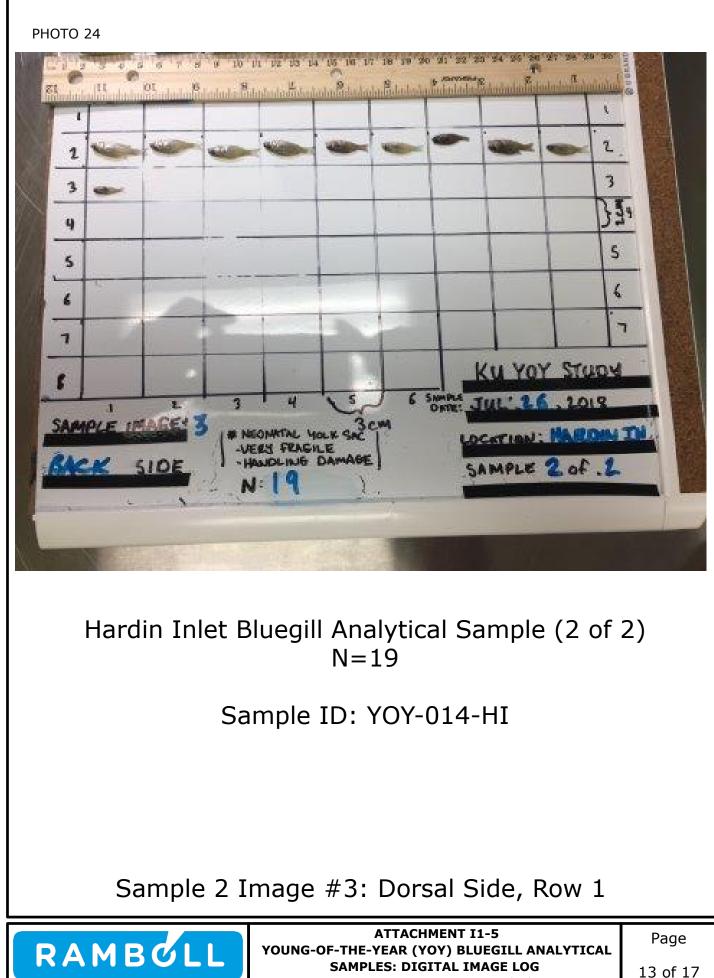
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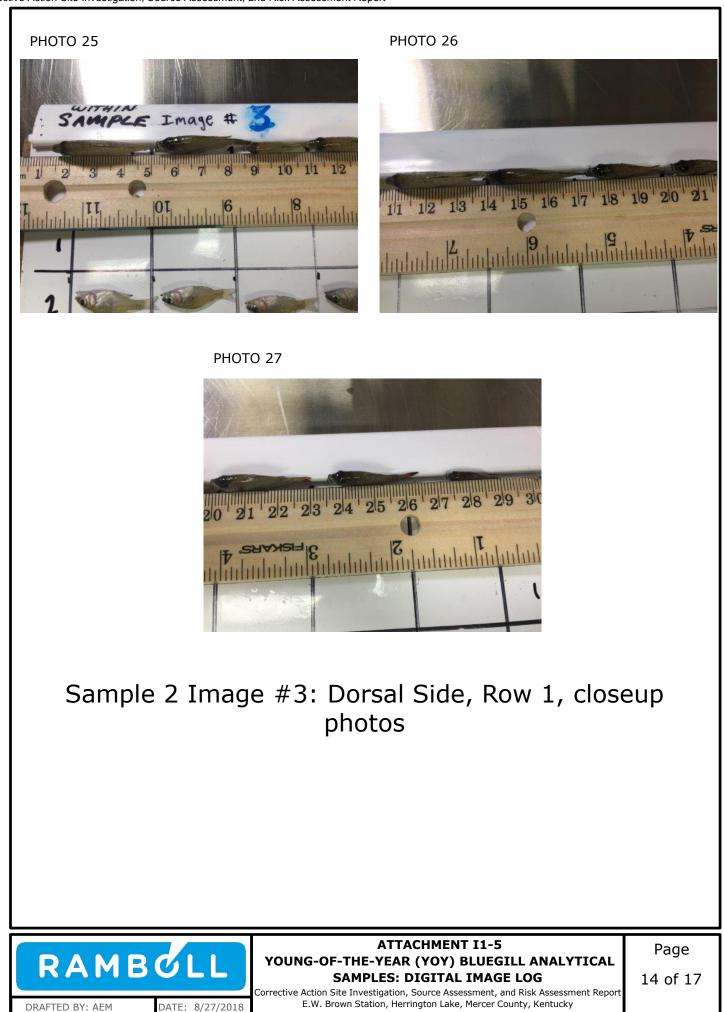


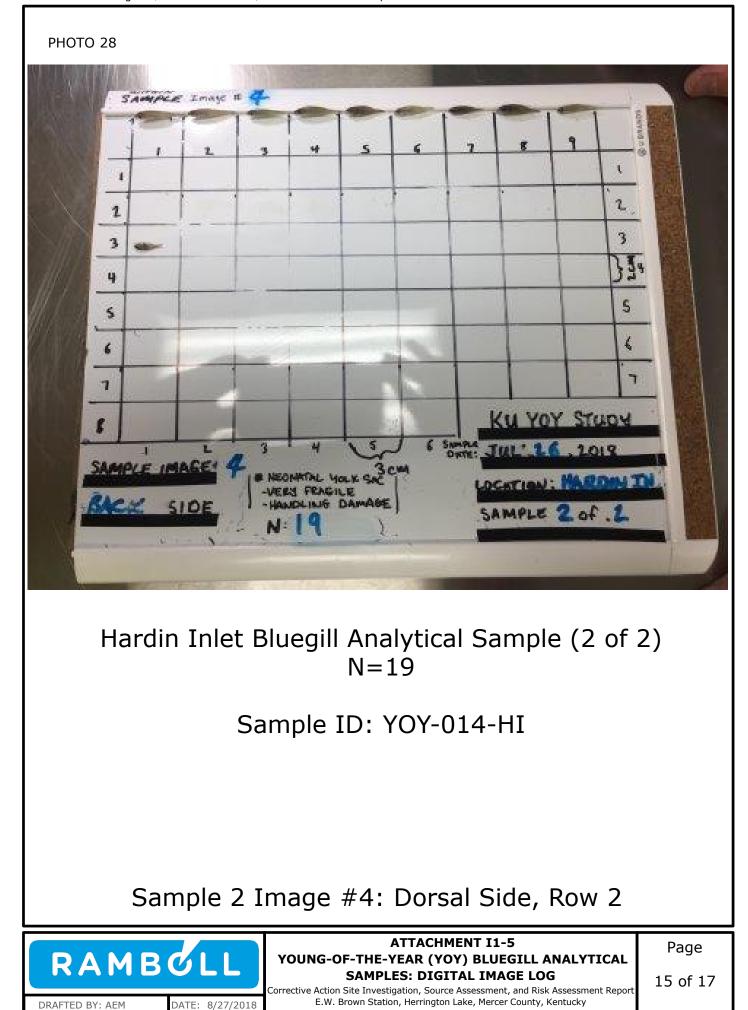


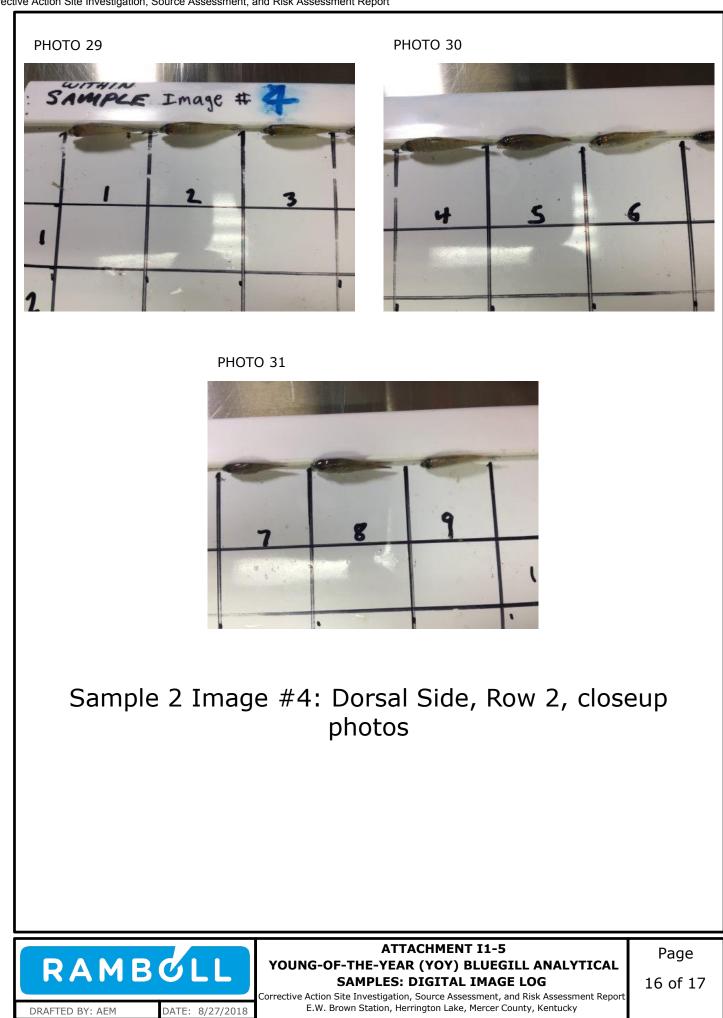


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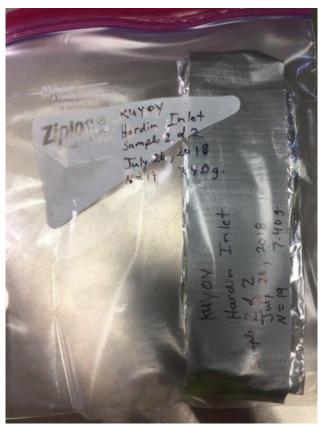












Sample 2 Image #5: Dorsal Side, Row 3, closeup photo and Sample 2 sample bag



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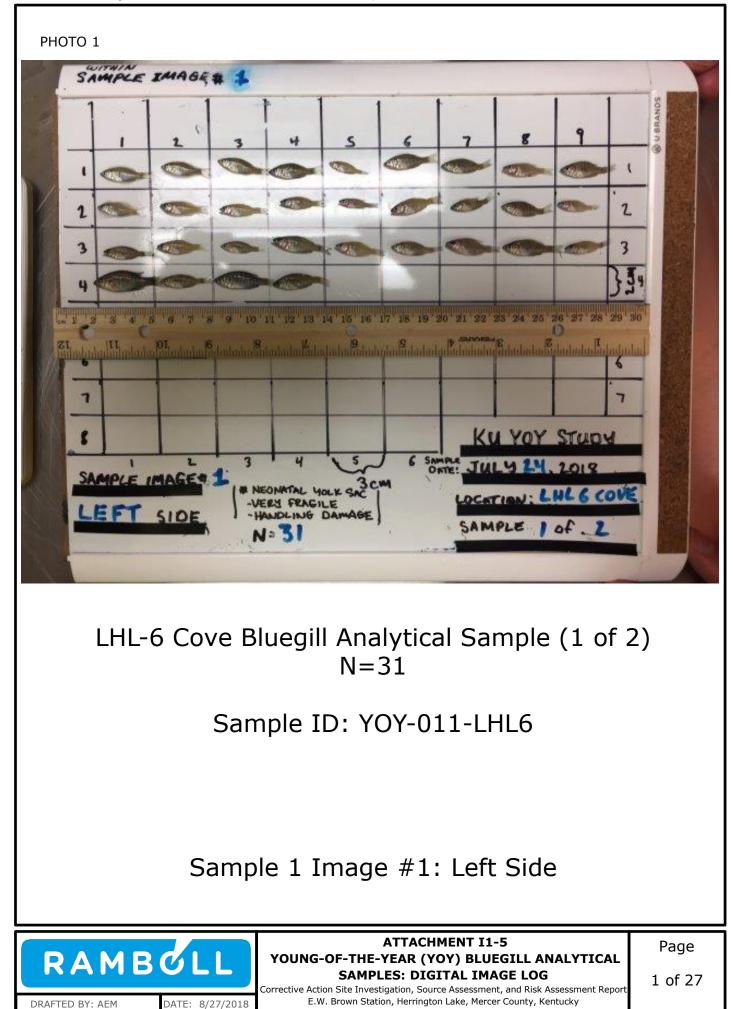
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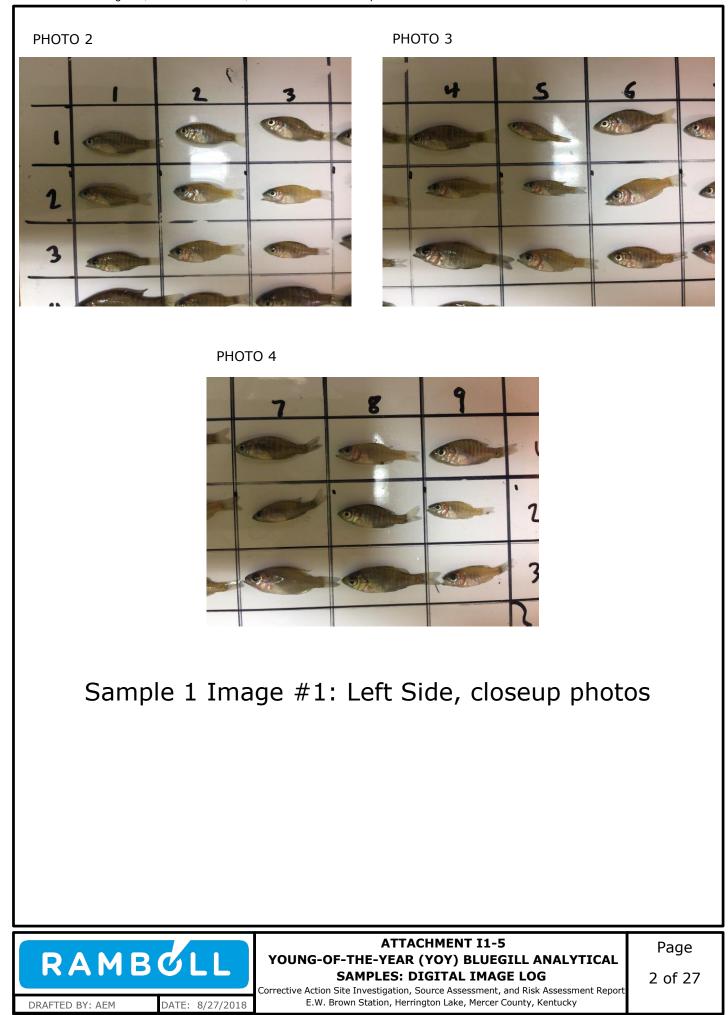
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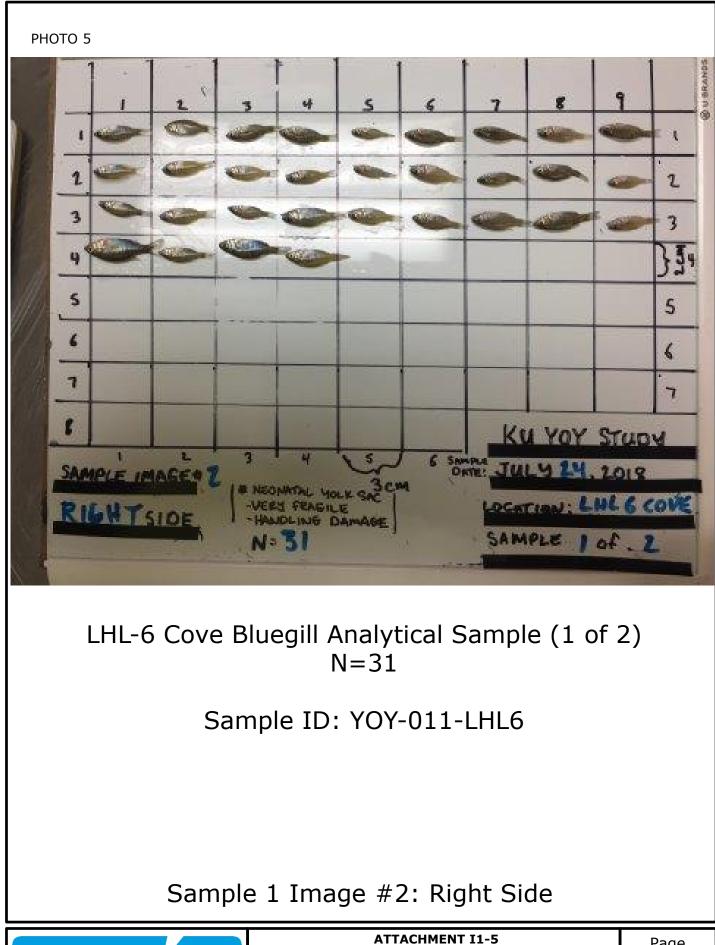
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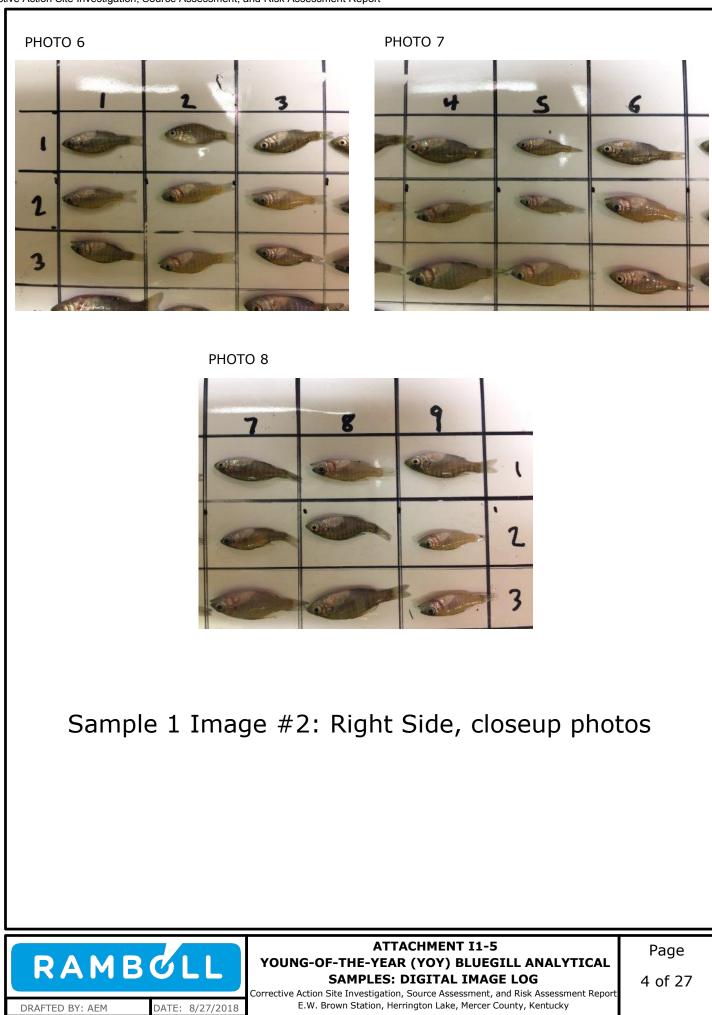


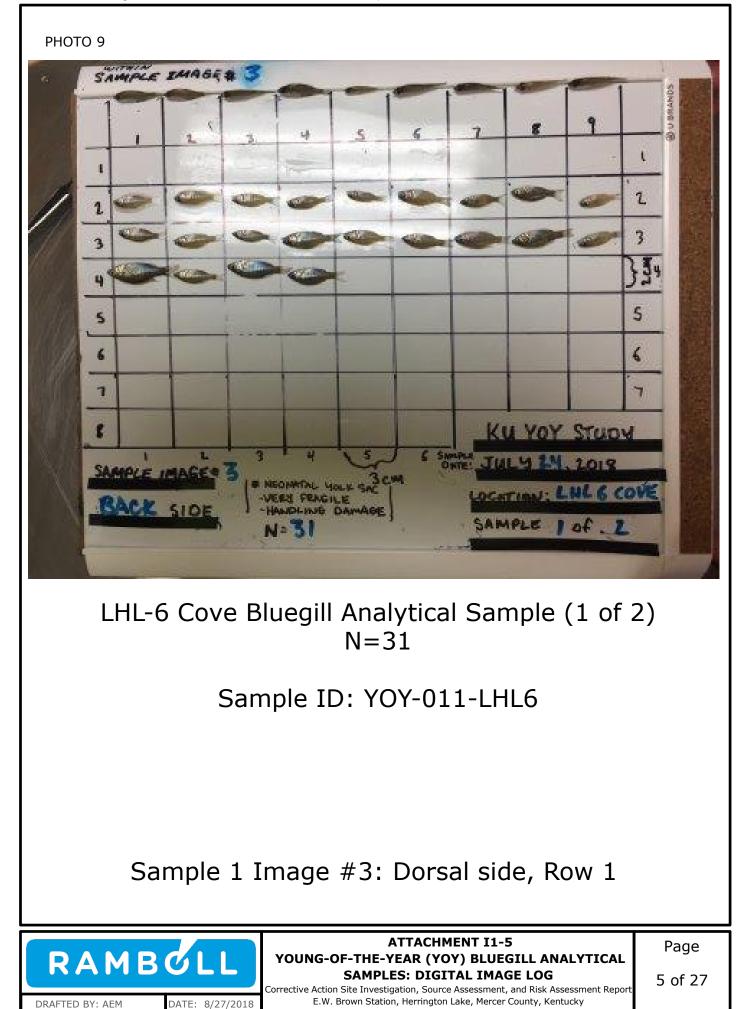




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Sample 1 Image #3: Dorsal side, Row 1, closeup photos



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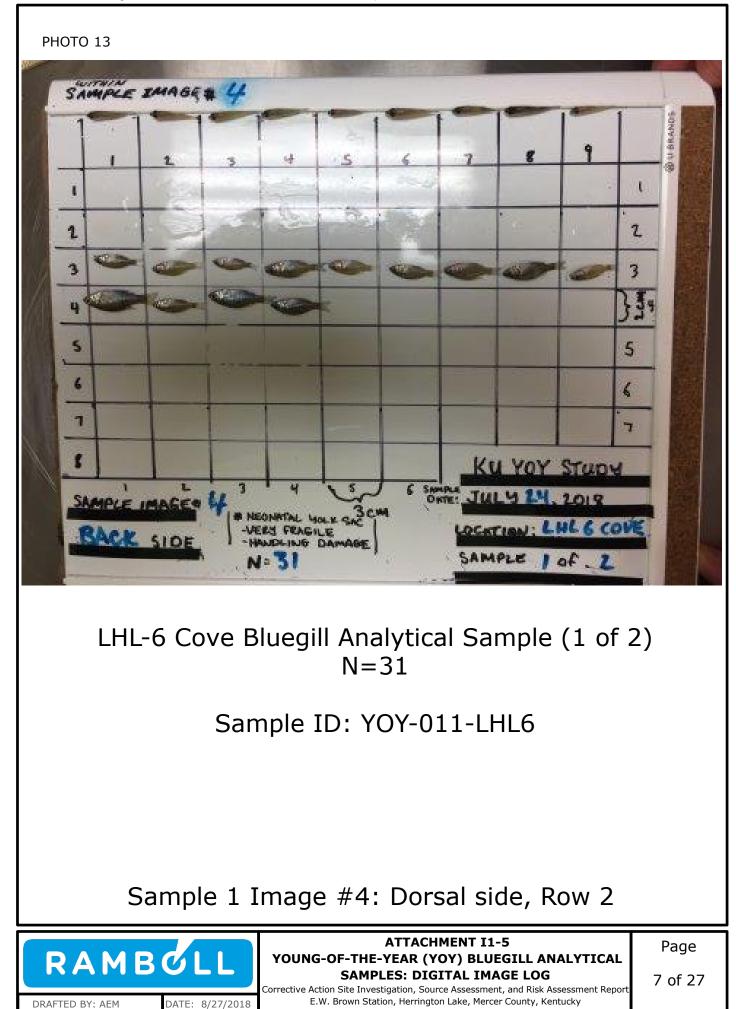
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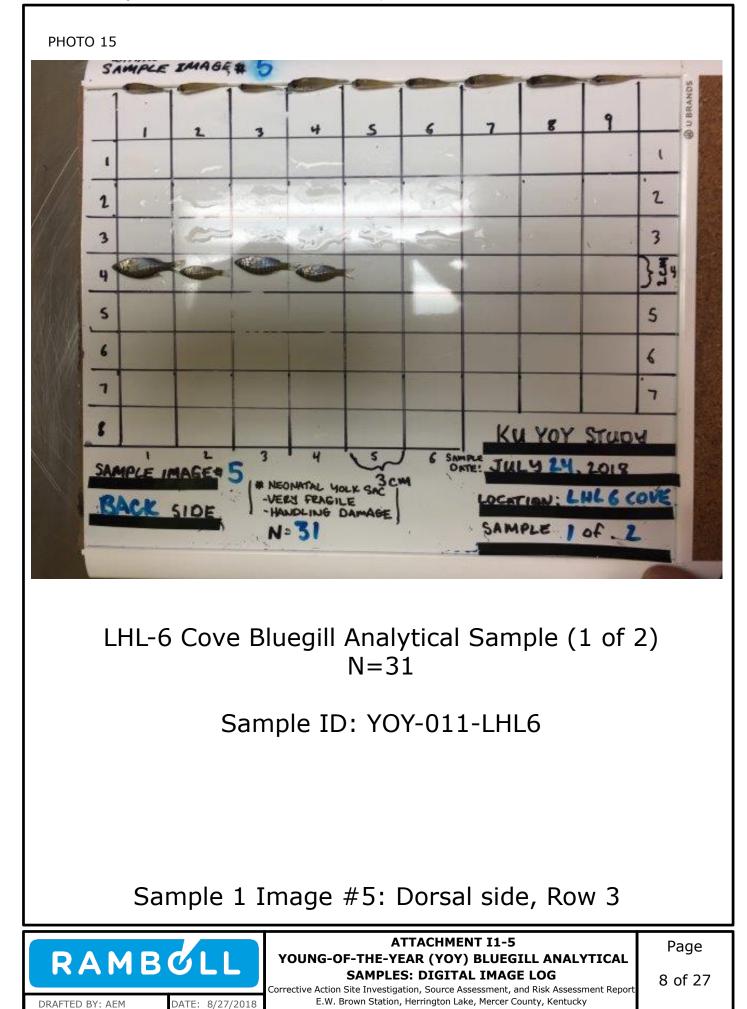
ATTACHMENT I1-5 YOUNG-OF-THE-YEAR (YOY) BLUEGILL ANALYTICAL SAMPLES: DIGITAL IMAGE LOG Corrective Action Site Investigation, Source Assessment, and Risk Assessment Report

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**PHOTO 17** 







Sample 1 Image #5: Dorsal side, Row 3, closeup photos



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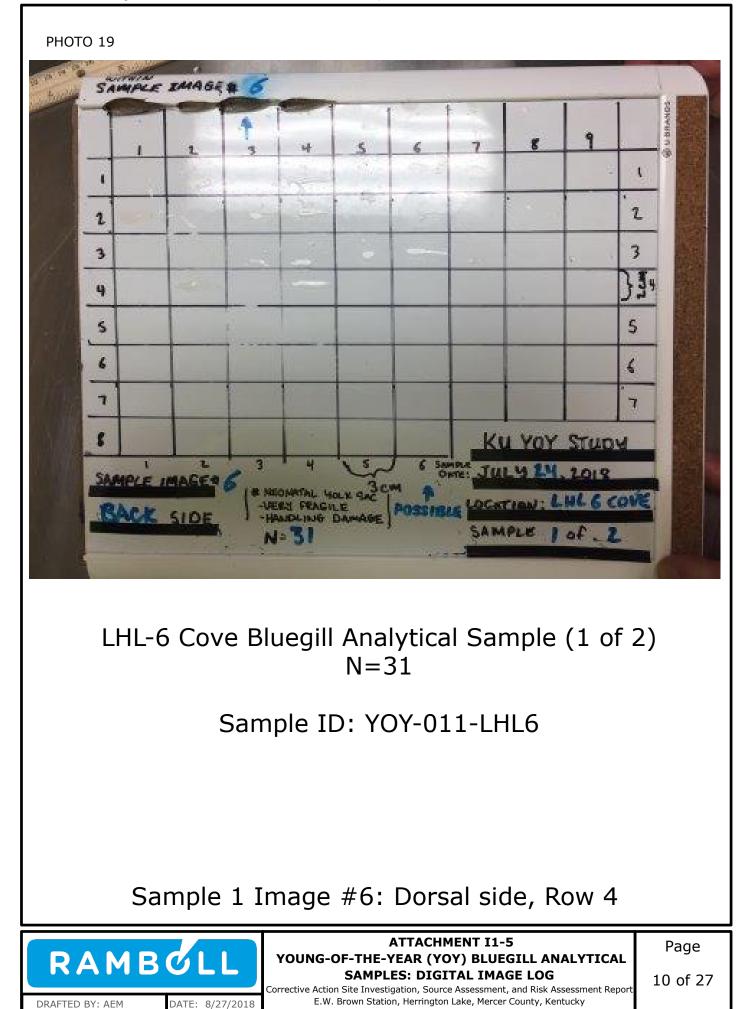




PHOTO 21



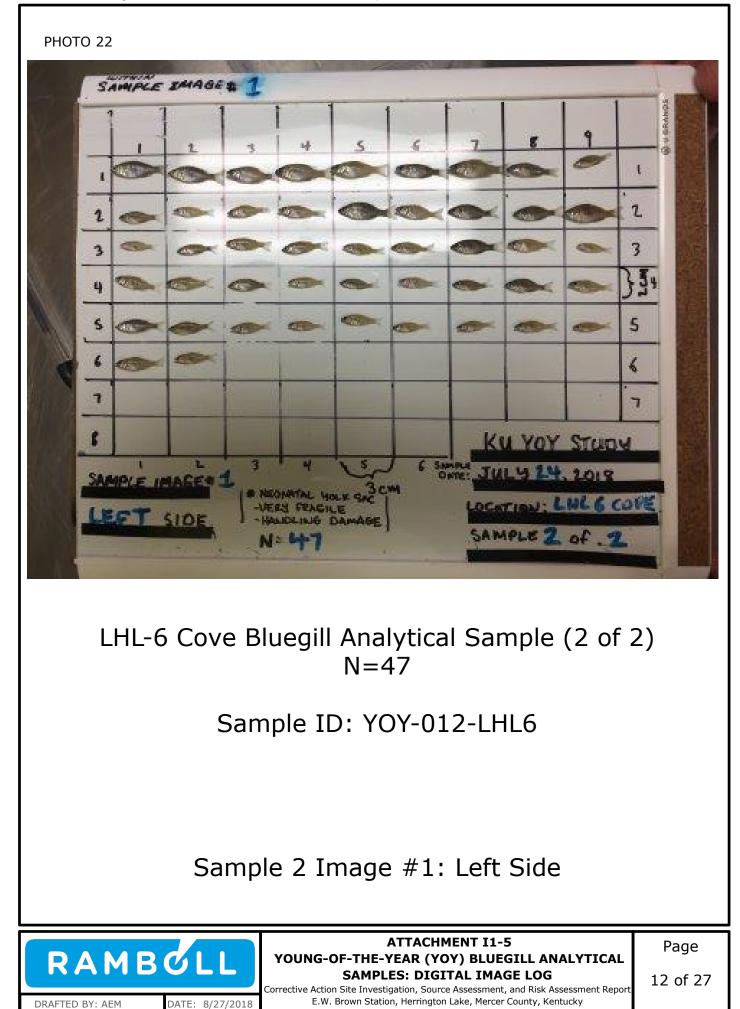
Sample 1 Image #6: Dorsal side, Row 4, closeup photos

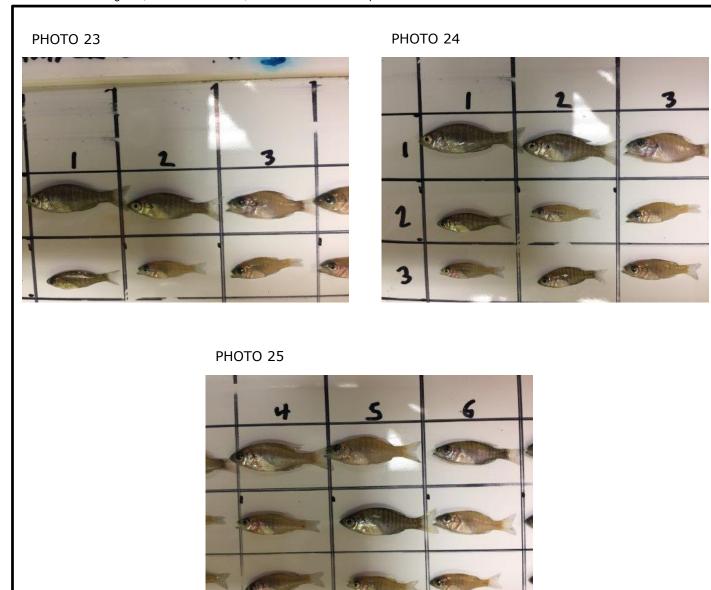


ATTACHMENT I1-5 YOUNG-OF-THE-YEAR (YOY) BLUEGILL ANALYTICAL SAMPLES: DIGITAL IMAGE LOG Corrective Action Site Investigation, Source Assessment, and Risk Assessment Report

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Sample 2 Image #1: Left Side, closeup photos



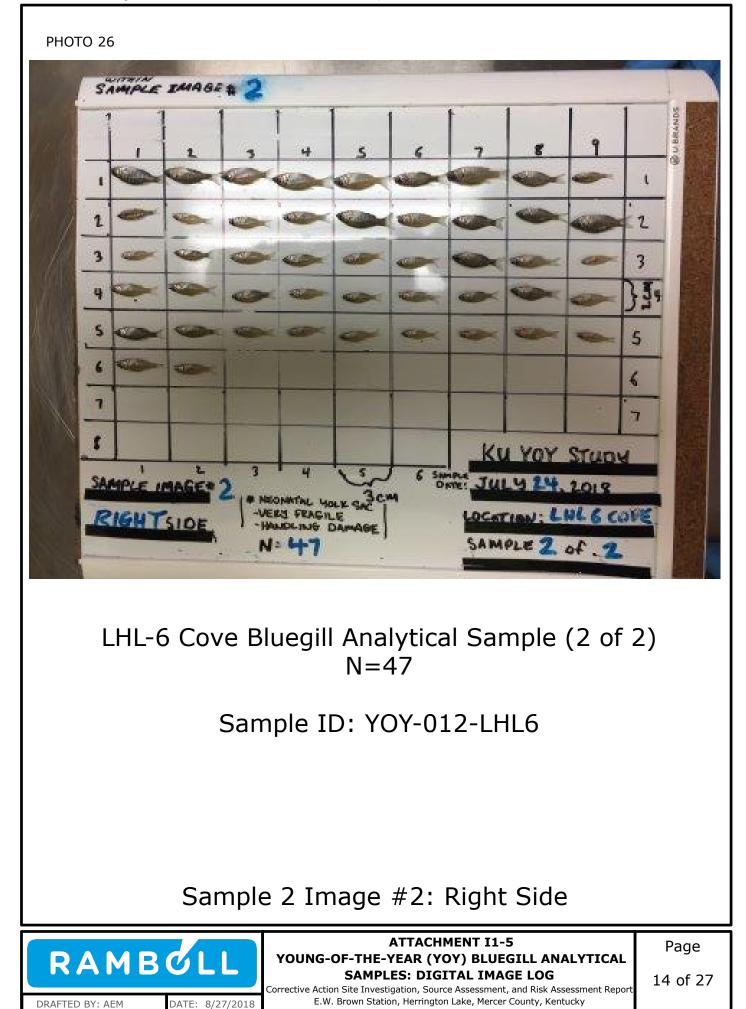
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**ATTACHMENT I1-5** YOUNG-OF-THE-YEAR (YOY) BLUEGILL ANALYTICAL SAMPLES: DIGITAL IMAGE LOG Corrective Action Site Investigation, Source Assessment, and Risk Assessment Report

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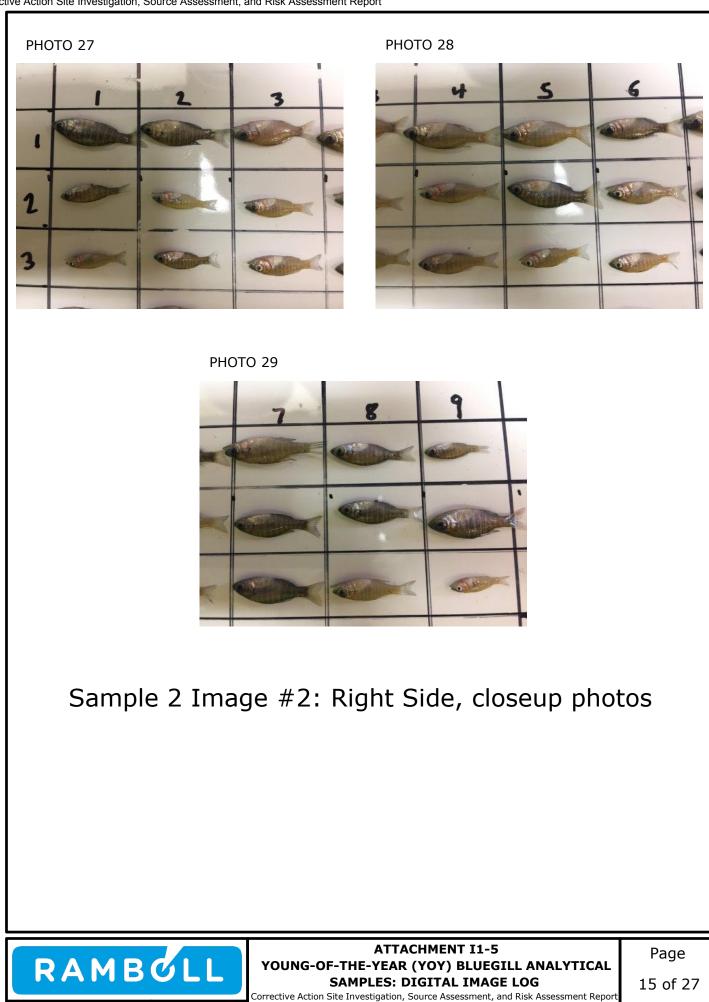
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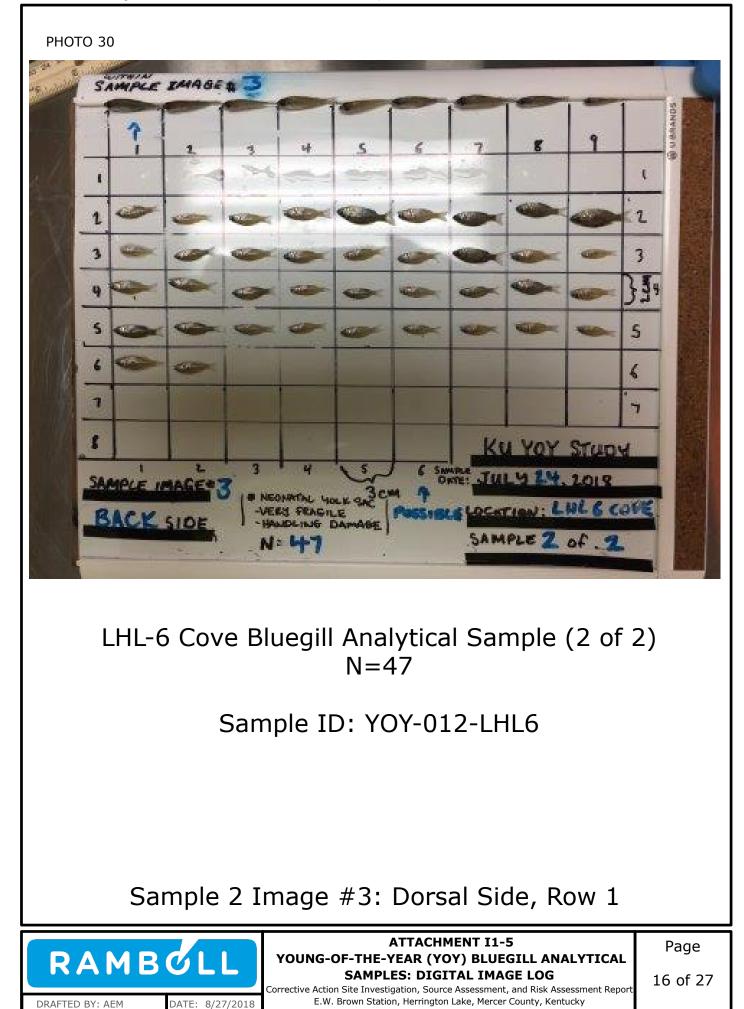


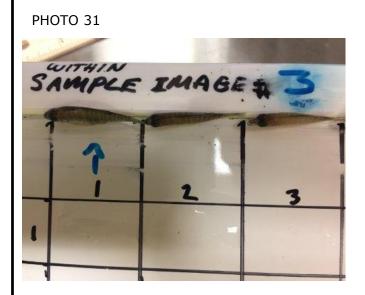
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**PHOTO 32** 







Sample 2 Image #3: Dorsal Side, Row 1, closeup photos



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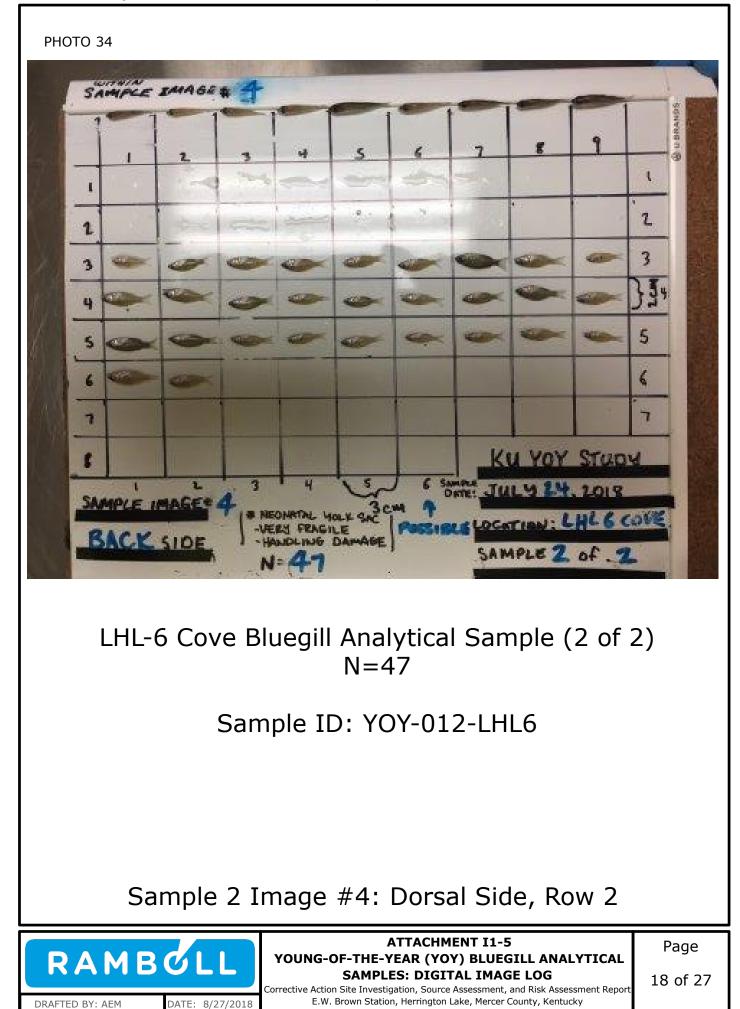
**ATTACHMENT I1-5** 

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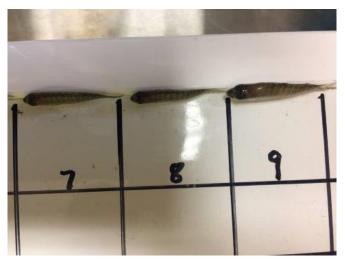
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**PHOTO 37** 



**PHOTO 36** 

Sample 2 Image #4: Dorsal Side, Row 2, closeup photos



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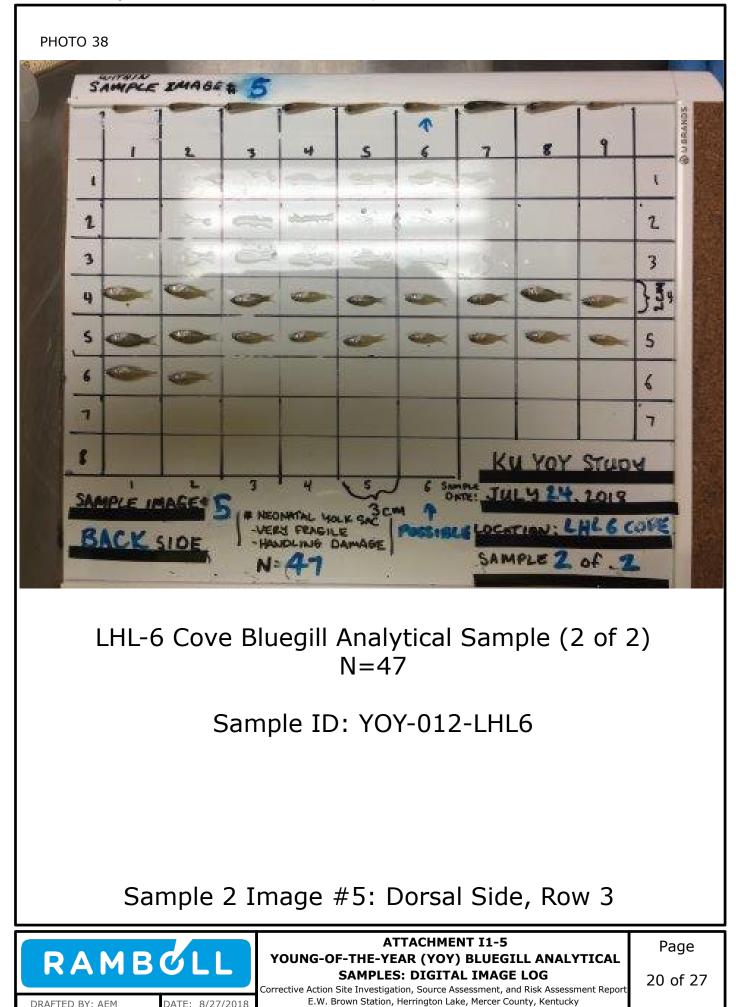
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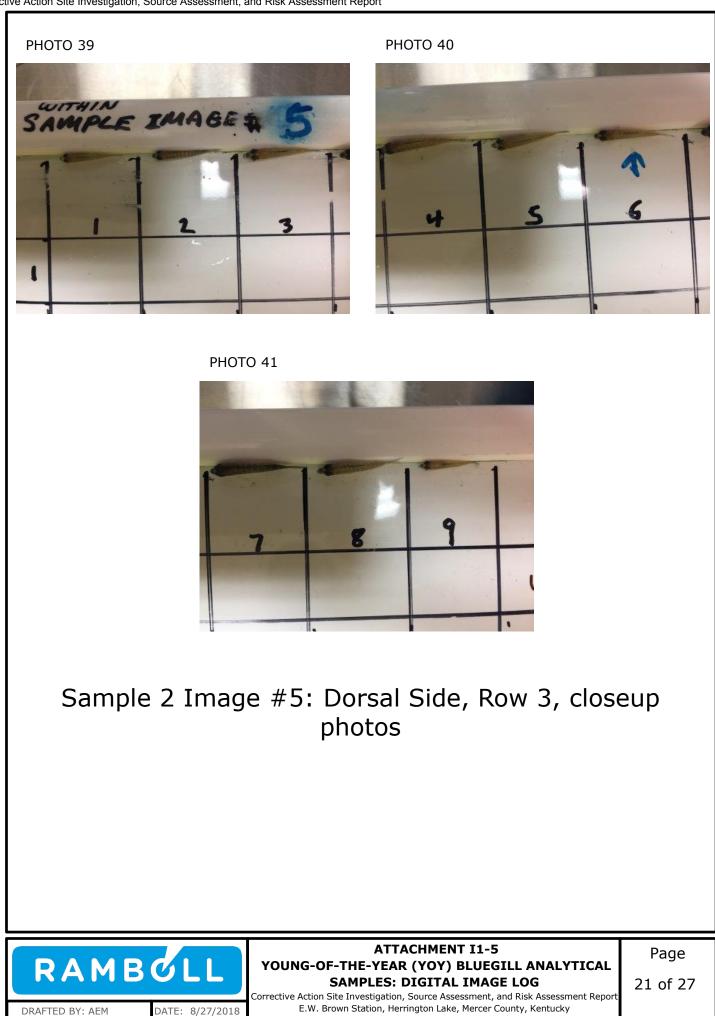
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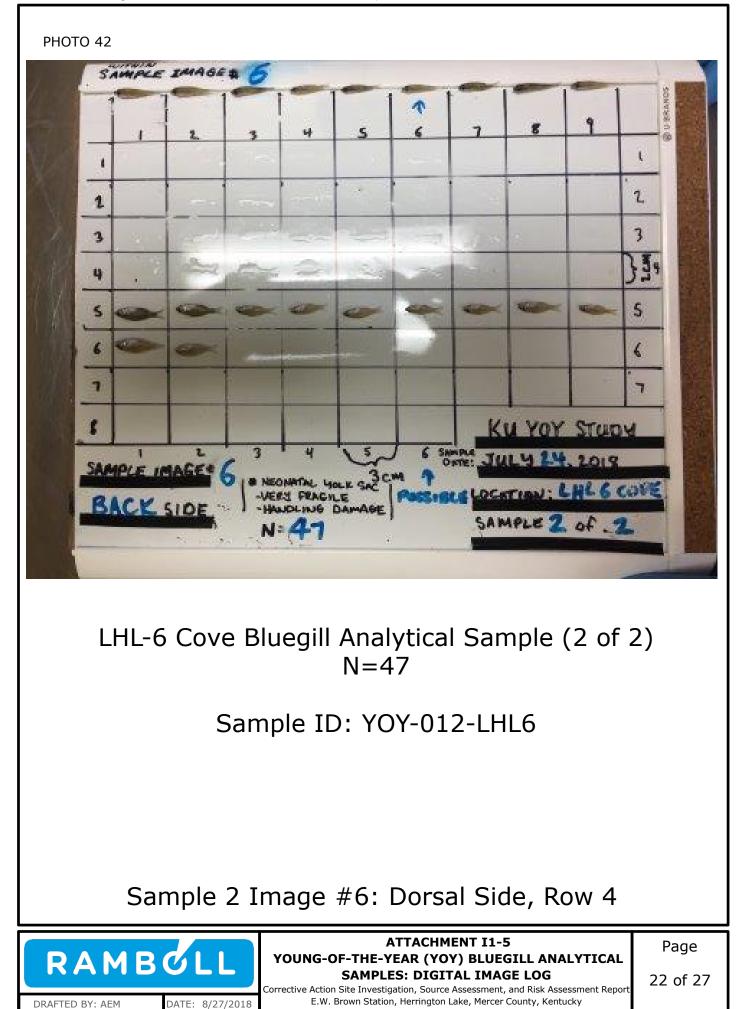




PHOTO 44







Sample 2 Image #6: Dorsal Side, Row 4, closeup photos



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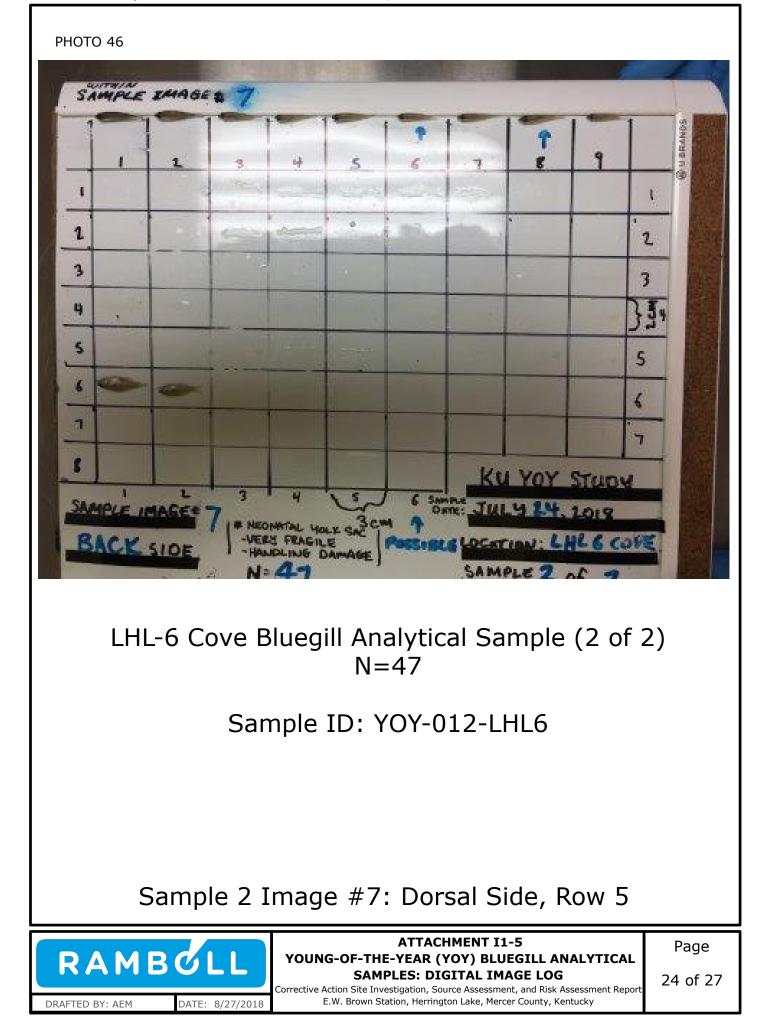
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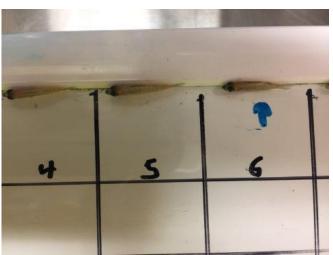
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**PHOTO 48** 



**PHOTO 49** 



Sample 2 Image #7: Dorsal Side, Row 5, closeup photos



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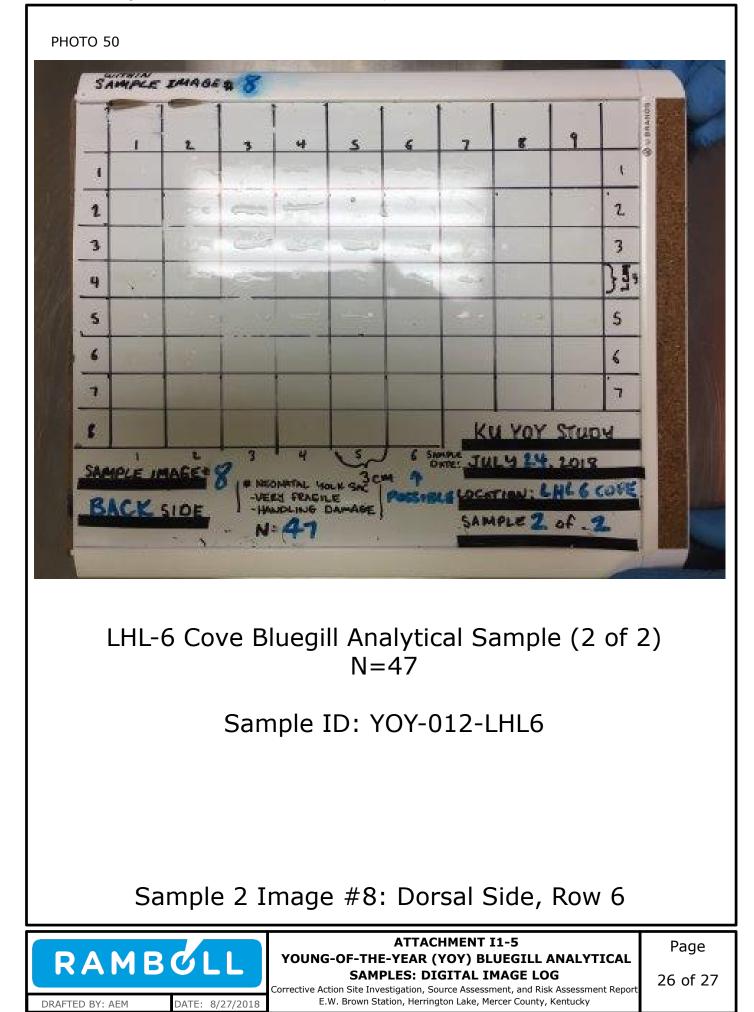
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**ATTACHMENT I1-5** YOUNG-OF-THE-YEAR (YOY) BLUEGILL ANALYTICAL SAMPLES: DIGITAL IMAGE LOG Corrective Action Site Investigation, Source Assessment, and Risk Assessment Report

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Sample 2 Image #8: Dorsal Side, Row 6, closeup photos



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# APPENDIX I: ECOLOGICAL RISK ASSESSMENT (ERA) SUPPORTING INFORMATION

Appendix I2: Alternative Selenium and Arsenic Screening Criteria Considerations

## **TABLES**

Reference Number	Author	CAS Number	Chemical Name	Species Scientific Name	Species Common Name	Species Group	Organism Lifestage	Exposure Type	Test Location	Duration (days)	Endpoint	Endpoint Type	Effect	Effect Measurement
81809	Swift,M.C.	15498870	Selenious acid, Sodium salt	Isopoda	Sowbug Order	Crustaceans	Not reported	Lotic	Field artificial	399	NOEC	No effect	Population	Abundance
81809	Swift,M.C.	15498870	Selenious acid, Sodium salt	Tubifex sp.	Tubificid Worm	Worms	Not reported	Lotic	Field artificial	399	NOEC	No effect	Population	Abundance
81809	Swift,M.C.	15498870	Selenious acid, Sodium salt	Isopoda	Sowbug Order	Crustaceans	Not reported	Lotic	Field artificial	399	LOEC	Low effect	Population	Abundance
81809	Swift,M.C.	15498870	Selenious acid, Sodium salt	Tubifex sp.	Tubificid Worm	Worms	Not reported	Lotic	Field artificial	399	LOEC	Low effect	Population	Abundance
166026	Ouellette,J.D., M.G. Dube, and S. Niyogi	13410010	Selenic acid, sodium salt (1:2)	Chironomus dilutus	Midge	Insects/Spiders	Not reported	Flow-through	Lab	21	NOEC	No effect	Population	Abundance
60234	Foe,C., and A.W. Knight	10102188	Selenious acid, Sodium salt (1:2)	Daphnia magna	Water Flea	Crustaceans; Standard Test Species	Neonate	Renewal	Lab	10	NR-ZERO	No effect	Mortality	Mortality
166838	Pieterek,T., and M. Pietrock	13410010	Selenic acid, sodium salt (1:2)	Hyalella azteca	Scud	Crustaceans; Standard Test Species	Adult	Renewal	Lab	8.8	NOEC	No effect	Mortality	Survivorship
81809	Swift,M.C.	15498870	Selenious acid, Sodium salt	Amphipoda	Scud Order	Crustaceans	Not reported	Lotic	Field artificial	399	NOEC	No effect	Population	Abundance
81809	Swift,M.C.	15498870	Selenious acid, Sodium salt	Baetidae	Mayfly Family	Insects/Spiders	Not reported	Lotic	Field artificial	399	NOEC	No effect	Population	Abundance
81809	Swift,M.C.	15498870	Selenious acid, Sodium salt	Enallagma sp.	Damselfly	Insects/Spiders	Not reported	Lotic	Field artificial	399	NOEC	No effect	Population	Abundance
81809	Swift,M.C.	15498870	Selenious acid, Sodium salt	Chironomidae	Midge Family	Insects/Spiders	Not reported	Lotic	Field artificial	399	NOEC	No effect	Population	Abundance
3783	Gallego-Gallegos,M., L.E. Doig, J.J. Tse, I.J. Pickering, and K. Liber	7782492	Selenium	Chironomus dilutus	Midge	Insects/Spiders	Larva	Renewal	Lab	10	NOEC	No effect	Growth	Weight
956	Kimball,G.	7783008	Selenious acid	Daphnia magna	Water Flea	Crustaceans; Standard Test Species	Multiple	Renewal	Lab	28	NOEC	No effect	Reproduction	Progeny counts/numbers
4960	Ingersoll,C.G., F.J. Dwyer, and T.W. May	7782492	Selenium	Daphnia magna	Water Flea	Crustaceans; Standard Test Species	Not reported	Flow-through	Lab	21	NOEC	No effect	Growth	Growth, general
4960	Lawrence,S.G., and M.H. Holoka	15498870	Selenious acid, Sodium salt	Calanoida	Copepod Order	Crustaceans	Not reported	Lentic	Field natural	10	LOEC	Low effect	Population	Biomass
4960	Lawrence,S.G., and M.H. Holoka	15498870	Selenious acid, Sodium salt	Cladocera	Water Flea Order	Crustaceans	Not reported	Lentic	Field natural	10	LOEC	Low effect	Population	Abundance
4960	Lawrence,S.G., and M.H. Holoka	15498870	Selenious acid, Sodium salt	Cladocera	Water Flea Order	Crustaceans	Not reported	Lentic	Field natural	10	LOEC	Low effect	Population	Biomass
4960	Lawrence,S.G., and M.H. Holoka	15498870	Selenious acid, Sodium salt	Calanoida	Copepod Order	Crustaceans	Not reported	Lentic	Field natural	10	NOEC	No effect	Population	Abundance
4960	Lawrence,S.G., and M.H. Holoka	15498870	Selenious acid, Sodium salt	Cyclopoida	Copepod Order	Crustaceans	Not reported	Lentic	Field natural	10	NOEC	No effect	Population	Abundance
4960	Lawrence,S.G., and M.H. Holoka	15498870	Selenious acid, Sodium salt	Cyclopoida	Copepod Order	Crustaceans	Not reported	Lentic	Field natural	10	NOEC	No effect	Population	Abundance
3783	Lawrence,S.G., and M.H. Holoka	15498870	Selenious acid, Sodium salt	Cyclopoida	Copepod Order	Crustaceans	Not reported	Lentic	Field natural	10	NOEC	No effect	Population	Biomass

Reference Number	Author	CAS Number	Chemical Name	Species Scientific Name	Species Common Name	Species Group	Organism Lifestage	Exposure Type	Test Location	Duration (days)	Endpoint	Endpoint Type	Effect	Effect Measurement
166838	Kimball,G.	7783008	Selenious acid	Daphnia magna	Water Flea	Crustaceans; Standard Test Species	Multiple	Renewal	Lab	28	LOEC	Low effect	Reproduction	Progeny counts/numbers
18379	Pieterek,T., and M. Pietrock	13410010	Selenic acid, sodium salt (1:2)	Hyalella azteca	Scud	Crustaceans; Standard Test Species	Adult	Renewal	Lab	8.8	LOEC	Low effect	Mortality	Survivorship
18379	Owsley, J.A.	10102188	Selenious acid, Sodium salt (1:2)	Ceriodaphnia affinis	Water Flea	Crustaceans	Not reported	Renewal	Lab	14	NOEC	No effect	Population	Abundance
18379	Adams,W.J., and B.B. Heidolph	10102188	Selenious acid, Sodium salt (1:2)	Daphnia magna	Water Flea	Crustaceans; Standard Test Species	Not reported	Renewal	Lab	7	NOEC	No effect	Mortality	Survival
18379	Adams,W.J., and B.B. Heidolph	10102188	Selenious acid, Sodium salt (1:2)	Daphnia magna	Water Flea	Crustaceans; Standard Test Species	Not reported	Renewal	Lab	14	NOEC	No effect	Mortality	Survival
18379	Adams,W.J., and B.B. Heidolph	10102188	Selenious acid, Sodium salt (1:2)	Daphnia magna	Water Flea	Crustaceans; Standard Test Species	Not reported	Renewal	Lab	14	NOEC	No effect	Reproduction	Reproduction, general
3783	Adams,W.J., and B.B. Heidolph	10102188	Selenious acid, Sodium salt (1:2)	Daphnia magna	Water Flea	Crustaceans; Standard Test Species	Not reported	Renewal	Lab	21	NOEC	No effect	Reproduction	Reproduction, general
956	Adams,W.J., and B.B. Heidolph	10102188	Selenious acid, Sodium salt (1:2)	Daphnia magna	Water Flea	Crustaceans; Standard Test Species	Not reported	Renewal	Lab	21	NOEC	No effect	Mortality	Survival
3783	Kimball,G.	7783008	Selenious acid	Daphnia magna	Water Flea	Crustaceans; Standard Test Species	Adult	Renewal	Lab	7	NR-ZERO	No effect	Mortality	Mortality
3783	Ingersoll,C.G., F.J. Dwyer, and T.W. May	7782492	Selenium	Chironomus riparius	Midge	Insects/Spiders; Standard Test Species	Not reported	Flow-through	Lab	30	NOEC	No effect	Development	Emergence
13729	Kimball,G.	7783008	Selenious acid	Daphnia magna	Water Flea	Crustaceans; Standard Test Species	Adult	Renewal	Lab	7	NOEC	No effect	Reproduction	Progeny counts/numbers
18379	Kimball,G.	7783008	Selenious acid	Daphnia magna	Water Flea	Crustaceans; Standard Test Species	Multiple	Renewal	Lab	28	NR-ZERO	No effect	Mortality	Mortality
18379	Naddy,R.B., T.W. LaPoint, and S.J. Klaine	13410010	Selenic acid, sodium salt (1:2)	Ceriodaphnia dubia	Water Flea	Crustaceans; Standard Test Species	Neonate	Renewal	Lab	8	NR-ZERO	No effect	Mortality	Mortality
18379	Adams,W.J., and B.B. Heidolph	10102188	Selenious acid, Sodium salt (1:2)	Daphnia magna	Water Flea	Crustaceans; Standard Test Species	Not reported	Renewal	Lab	7	LOEC	Low effect	Mortality	Survival
3783	Adams,W.J., and B.B. Heidolph	10102188	Selenious acid, Sodium salt (1:2)	Daphnia magna	Water Flea	Crustaceans; Standard Test Species	Not reported	Renewal	Lab	14	LOEC	Low effect	Mortality	Survival
10836	Adams,W.J., and B.B. Heidolph	10102188	Selenious acid, Sodium salt (1:2)	Daphnia magna	Water Flea	Crustaceans; Standard Test Species	Not reported	Renewal	Lab	21	LOEC	Low effect	Mortality	Survival
4960	Gallego-Gallegos,M., L.E. Doig, J.J. Tse, I.J. Pickering, and K. Liber	7782492	Selenium	Chironomus dilutus	Midge	Insects/Spiders	Larva	Renewal	Lab	10	LOEC	Low effect	Growth	Weight

Reference Number	Author	CAS Number	Chemical Name	Species Scientific Name	Species Common Name	Species Group	Organism Lifestage	Exposure Type	Test Location	Duration (days)	Endpoint	Endpoint Type	Effect	Effect Measurement
4960	Kimball,G.	7783008	Selenious acid	Daphnia magna	Water Flea	Crustaceans; Standard Test Species	Adult	Renewal	Lab	7	LOEC	Low effect	Reproduction	Progeny counts/numbers
4960	Gallego-Gallegos,M., L.E. Doig, J.J. Tse, I.J. Pickering, and K. Liber	15498870	Selenious acid, Sodium salt	Chironomus dilutus	Midge	Insects/Spiders	Larva	Renewal	Lab	10	NOEC	No effect	Growth	Weight
4960	Hoang,T.C., and S.J. Klaine	10102188	Selenious acid, Sodium salt (1:2)	Daphnia magna	Water Flea	Crustaceans; Standard Test Species	Adult	Pulse	Lab	21	NOEC	No effect	Growth	Dry weight (AQUIRE only)
4960	Hoang,T.C., and S.J. Klaine	10102188	Selenious acid, Sodium salt (1:2)	Daphnia magna	Water Flea	Crustaceans; Standard Test Species	Adult	Pulse	Lab	21	NOEC	No effect	Growth	Dry weight (AQUIRE only)
115478	Hoang,T.C., and S.J. Klaine	10102188	Selenious acid, Sodium salt (1:2)	Daphnia magna	Water Flea	Crustaceans; Standard Test Species	Adult	Pulse	Lab	21	NOEC	No effect	Growth	Dry weight (AQUIRE only)
115478	Hoang,T.C., and S.J. Klaine	10102188	Selenious acid, Sodium salt (1:2)	Daphnia magna	Water Flea	Crustaceans; Standard Test Species	Adult	Pulse	Lab	21	NOEC	No effect	Growth	Dry weight (AQUIRE only)
115478	Hoang,T.C., and S.J. Klaine	10102188	Selenious acid, Sodium salt (1:2)	Daphnia magna	Water Flea	Crustaceans; Standard Test Species	Adult	Pulse	Lab	21	NOEC	No effect	Growth	Dry weight (AQUIRE only)
115478	Hoang,T.C., and S.J. Klaine	10102188	Selenious acid, Sodium salt (1:2)	Daphnia magna	Water Flea	Crustaceans; Standard Test Species	Adult	Pulse	Lab	21	NOEC	No effect	Growth	Dry weight (AQUIRE only)
115478	Hoang,T.C., and S.J. Klaine	10102188	Selenious acid, Sodium salt (1:2)	Daphnia magna	Water Flea	Crustaceans; Standard Test Species	Adult	Pulse	Lab	21	NOEC	No effect	Growth	Dry weight (AQUIRE only)
115478	Hoang,T.C., and S.J. Klaine	10102188	Selenious acid, Sodium salt (1:2)	Daphnia magna	Water Flea	Crustaceans; Standard Test Species	Adult	Pulse	Lab	21	NOEC	No effect	Growth	Dry weight (AQUIRE only)
166945	Hoang,T.C., and S.J. Klaine	10102188	Selenious acid, Sodium salt (1:2)	Daphnia magna	Water Flea	Crustaceans; Standard Test Species	Adult	Pulse	Lab	21	NOEC	No effect	Growth	Dry weight (AQUIRE only)
166945	Hoang,T.C., and S.J. Klaine	10102188	Selenious acid, Sodium salt (1:2)	Daphnia magna	Water Flea	Crustaceans; Standard Test Species	Adult	Pulse	Lab	21	NOEC	No effect	Growth	Dry weight (AQUIRE only)
166945	Hoang,T.C., and S.J. Klaine	10102188	Selenious acid, Sodium salt (1:2)	Daphnia magna	Water Flea	Crustaceans; Standard Test Species	Adult	Pulse	Lab	21	NOEC	No effect	Growth	Dry weight (AQUIRE only)
166945	Hoang,T.C., and S.J. Klaine	10102188	Selenious acid, Sodium salt (1:2)	Daphnia magna	Water Flea	Crustaceans; Standard Test Species	Adult	Pulse	Lab	21	NOEC	No effect	Growth	Dry weight (AQUIRE only)
101846	Dunbar,A.M., J.M. Lazorchak, and W.T. Waller	13410010	Selenic acid, sodium salt (1:2)	Daphnia magna	Water Flea	Crustaceans; Standard Test Species	Neonate	Renewal	Lab	32	NOEC	No effect	Growth	Growth, general
101846	Lawrence,S.G., and M.H. Holoka	15498870	Selenious acid, Sodium salt	Cyclopoida	Copepod Order	Crustaceans	Not reported	Lentic	Field natural	10	LOEC	Low effect	Population	Abundance
101846	Lawrence,S.G., and M.H. Holoka	15498870	Selenious acid, Sodium salt	Cyclopoida	Copepod Order	Crustaceans	Not reported	Lentic	Field natural	10	LOEC	Low effect	Population	Biomass

Reference Number	Author	CAS Number	Chemical Name	Species Scientific Name	Species Common Name	Species Group	Organism Lifestage	Exposure Type	Test Location	Duration (days)	Endpoint	Endpoint Type	Effect	Effect Measurement
101846	Lawrence,S.G., and M.H. Holoka	15498870	Selenious acid, Sodium salt	Calanoida	Copepod Order	Crustaceans	Not reported	Lentic	Field natural	10	LOEC	Low effect	Population	Abundance
101846	Lawrence,S.G., and M.H. Holoka	15498870	Selenious acid, Sodium salt	Cyclopoida	Copepod Order	Crustaceans	Not reported	Lentic	Field natural	10	LOEC	Low effect	Population	Abundance
101846	Lawrence,S.G., and M.H. Holoka	15498870	Selenious acid, Sodium salt	Cyclopoida	Copepod Order	Crustaceans	Not reported	Lentic	Field natural	10	NOEC	No effect	Population	Biomass
101846	Jensen,P.D., M.A. Sorensen, W.E. Walton, and J.T. Trumble	13410010	Selenic acid, sodium salt (1:2)	Culex quinquefasciatus	Southern House Mosquito	Insects/Spiders	Larva	Aquatic - not reported	Lab	8	LOEL	Low effect	Growth	Relative growth rate
101846	Jensen,P.D., M.A. Sorensen, W.E. Walton, and J.T. Trumble	13410010	Selenic acid, sodium salt (1:2)	Culex quinquefasciatus	Southern House Mosquito	Insects/Spiders	Larva	Aquatic - not reported	Lab	10	LOEL	Low effect	Growth	Relative growth rate
101846	Jensen,P.D., M.A. Sorensen, W.E. Walton, and J.T. Trumble	13410010	Selenic acid, sodium salt (1:2)	Culex quinquefasciatus	Southern House Mosquito	Insects/Spiders	Larva	Aquatic - not reported	Lab	12	LOEL	Low effect	Growth	Relative growth rate
101846	Jensen,P.D., M.A. Sorensen, W.E. Walton, and J.T. Trumble	13410010	Selenic acid, sodium salt (1:2)	Culex quinquefasciatus	Southern House Mosquito	Insects/Spiders	Larva	Aquatic - not reported	Lab	14	LOEL	Low effect	Growth	Relative growth rate
101846	Jensen,P.D., M.A. Sorensen, W.E. Walton, and J.T. Trumble	13410010	Selenic acid, sodium salt (1:2)	Culex quinquefasciatus	Southern House Mosquito	Insects/Spiders	Larva	Aquatic - not reported	Lab	14	NOEL	No effect	Mortality	Survival
101846	Jensen,P.D., M.A. Sorensen, W.E. Walton, and J.T. Trumble	13410010	Selenic acid, sodium salt (1:2)	Culex quinquefasciatus	Southern House Mosquito	Insects/Spiders	Larva	Aquatic - not reported	Lab	14	LOEL	Low effect	Mortality	Survival

Notes:

LOEC lowest observable effect concentration

LOEL lowest observable effect level

NOEC no observable effect concentration

NOEL no observable effect level

NR-ZERO No response

Reference Number	Author	Concentration Type	Order	Concentration	% of Data	Title	Source	Publication Year
81809	Swift,M.C.	Total	1	0.0025	0.02	Stream Ecosystem Response to, and Recovery from, Experimental Exposure to Selenium	J. Aquat. Ecosyst. Stress Recovery9(3): 159-184	2002
81809	Swift,M.C.	Total	2	0.0025	0.03	Stream Ecosystem Response to, and Recovery from, Experimental Exposure to Selenium	J. Aquat. Ecosyst. Stress Recovery9(3): 159-184	2002
81809	Swift,M.C.	Total	3	0.01	0.05	Stream Ecosystem Response to, and Recovery from, Experimental Exposure to Selenium	J. Aquat. Ecosyst. Stress Recovery9(3): 159-184	2002
81809	Swift,M.C.	Total	4	0.01	0.06	Stream Ecosystem Response to, and Recovery from, Experimental Exposure to Selenium	J. Aquat. Ecosyst. Stress Recovery9(3): 159-184	2002
166026	Ouellette,J.D., M.G. Dube, and S. Niyogi	Total	5	0.01	0.08	A Single Metal, Metal Mixture, and Whole-Effluent Approach to Investigate Causes of Metal Mine Effluent Effects on Fathead Minnows (Pimephales promelas)	Water Air Soil Pollut.224(1462): 44 p.	2013
60234	Foe,C., and A.W. Knight	Total	6	0.0149	0.09		Manuscr., Dep. of Land, Air and Water Resources, Univ. of California, Davis, CA:	1986
166838	Pieterek, T., and M. Pietrock	Total	7	0.018	0.11	Comparative Selenium Toxicity to Laboratory-Reared and Field-Collected Hyalella azteca (Amphipoda, Hyalellidae)	Water Air Soil Pollut.223(7): 4245-4252	2012
81809	Swift,M.C.	Total	8	0.029	0.12	Stream Ecosystem Response to, and Recovery from, Experimental Exposure to Selenium	J. Aquat. Ecosyst. Stress Recovery9(3): 159-184	2002
81809	Swift,M.C.	Total	9	0.029	0.14	Stream Ecosystem Response to, and Recovery from, Experimental Exposure to Selenium	J. Aquat. Ecosyst. Stress Recovery9(3): 159-184	2002
81809	Swift,M.C.	Total	10	0.029	0.15	Stream Ecosystem Response to, and Recovery from, Experimental Exposure to Selenium	J. Aquat. Ecosyst. Stress Recovery9(3): 159-184	2002
81809	Swift,M.C.	Total	11	0.029	0.17	Stream Ecosystem Response to, and Recovery from, Experimental Exposure to Selenium	J. Aquat. Ecosyst. Stress Recovery9(3): 159-184	2002
3783	Gallego-Gallegos,M., L.E. Doig, J.J. Tse, I.J. Pickering, and K. Liber	Total	12	0.0602	0.18	Bioavailability, Toxicity and Biotransformation of Selenium in Midge (Chironomus dilutus) Larvae Exposed via Water or Diet to Elemental Selenium Particles, Selenite, or Selenized Algae	Environ. Sci. Technol.47(1): 584-592	2013
956	Kimball,G.	Total	13	0.07	0.20	The Effects of Lesser Known Metals and One Organic to Fathead Minnows (Pimenhales promelas) and Danhnia magna	Manuscript, Department of Entomology, Fisheries and Wildlife, University of Minnesota, Minneapolis, MN:88 p.	1978
4960	Ingersoll,C.G., F.J. Dwyer, and T.W. May	Total	14	0.085	0.22	Toxicity of Inorganic and Organic Selenium to Daphnia magna (Cladocera) and Chironomus riparius (Diptera)	Environ. Toxicol. Chem.9(9): 1171-1181	1990
4960	Lawrence,S.G., and M.H. Holoka	Total	15	0.1	0.23	Effect of Selenium on Impounded Zooplankton in a Mercury Contaminated Lake	Can. Tech. Rep. Fish. Aquat. Sci.1151:83-92	1981
4960	Lawrence,S.G., and M.H. Holoka	Total	16	0.1	0.25	Effect of Selenium on Impounded Zooplankton in a Mercury Contaminated Lake	Can. Tech. Rep. Fish. Aquat. Sci.1151:83-92	1981
4960	Lawrence,S.G., and M.H. Holoka	Total	17	0.1	0.26	Effect of Selenium on Impounded Zooplankton in a Mercury Contaminated Lake	Can. Tech. Rep. Fish. Aquat. Sci.1151:83-92	1981
4960	Lawrence,S.G., and M.H. Holoka	Total	18	0.1	0.28	Effect of Selenium on Impounded Zooplankton in a Mercury Contaminated Lake	Can. Tech. Rep. Fish. Aquat. Sci.1151:83-92	1981
4960	Lawrence,S.G., and M.H. Holoka	Total	19	0.1	0.29	Effect of Selenium on Impounded Zooplankton in a Mercury Contaminated Lake	Can. Tech. Rep. Fish. Aquat. Sci.1151:83-92	1981
4960	Lawrence,S.G., and M.H. Holoka	Total	20	0.1	0.31	Effect of Selenium on Impounded Zooplankton in a Mercury Contaminated Lake	Can. Tech. Rep. Fish. Aquat. Sci.1151:83-92	1981
3783	Lawrence,S.G., and M.H. Holoka	Total	21	0.1	0.32	Effect of Selenium on Impounded Zooplankton in a Mercury Contaminated Lake	Can. Tech. Rep. Fish. Aquat. Sci.1151:83-92	1981

Reference Number	Author	Concentration Type	Order	Concentration	% of Data	Title	Source	Publication Year
166838	Kimball,G.	Total	22	0.12	0.34	The Effects of Lesser Known Metals and One Organic to Fathead Minnows (Pimephales promelas) and Daphnia magna	Manuscript, Department of Entomology, Fisheries and Wildlife, University of Minnesota, Minneapolis, MN:88 p.	1978
18379	Pieterek, T., and M. Pietrock	Total	24	0.164	0.37	Comparative Selenium Toxicity to Laboratory-Reared and Field-Collected Hyalella azteca (Amphipoda, Hyalellidae)	Water Air Soil Pollut.223(7): 4245-4252	2012
18379	Owsley, J.A.	Total	25	0.2	0.38	Acute and Chronic Effects of Selenite-Selenium on Ceriodaphnia affinis	M.S.Thesis, Vanderbilt University, Nashville, TN:83 p.	1984
18379	Adams,W.J., and B.B. Heidolph	Total	26	0.24	0.40	Short-Cut Chronic Toxicity Estimates Using Daphnia magna	ASTM Spec. Tech. Publ.:87-103	1985
18379	Adams,W.J., and B.B. Heidolph	Total	27	0.24	0.42	Short-Cut Chronic Toxicity Estimates Using Daphnia magna	ASTM Spec. Tech. Publ.:87-103	1985
18379	Adams,W.J., and B.B. Heidolph	Total	28	0.24	0.43	Short-Cut Chronic Toxicity Estimates Using Daphnia magna	ASTM Spec. Tech. Publ.:87-103	1985
3783	Adams,W.J., and B.B. Heidolph	Total	29	0.24	0.45	Short-Cut Chronic Toxicity Estimates Using Daphnia magna	ASTM Spec. Tech. Publ.:87-103	1985
956	Adams,W.J., and B.B. Heidolph	Total	30	0.24	0.46	Short-Cut Chronic Toxicity Estimates Using Daphnia magna	ASTM Spec. Tech. Publ.:87-103	1985
3783	Kimball,G.	Total	31	0.25	0.48	The Effects of Lesser Known Metals and One Organic to Fathead Minnows (Pimephales promelas) and Daphnia magna	Manuscript, Department of Entomology, Fisheries and Wildlife, University of Minnesota, Minneapolis, MN:88 p.	1978
3783	Ingersoll,C.G., F.J. Dwyer, and T.W. May	Total	32	0.303	0.49	Toxicity of Inorganic and Organic Selenium to Daphnia magna (Cladocera) and Chironomus riparius (Diptera)	Environ. Toxicol. Chem.9(9): 1171-1181	1990
13729	Kimball,G.	Total	33	0.45	0.51	The Effects of Lesser Known Metals and One Organic to Fathead Minnows (Pimephales promelas) and Daphnia magna	Manuscript, Department of Entomology, Fisheries and Wildlife, University of Minnesota, Minneapolis, MN:88 p.	1978
18379	Kimball,G.	Total	34	0.48	0.52	The Effects of Lesser Known Metals and One Organic to Fathead Minnows (Pimephales promelas) and Daphnia magna	Manuscript, Department of Entomology, Fisheries and Wildlife, University of Minnesota, Minneapolis, MN:88 p.	1978
18379	Naddy,R.B., T.W. LaPoint, and S.J. Klaine	Total	35	0.51	0.54	Toxicity of Arsenic, Molybdenum and Selenium Combinations to Ceroidaphnia dubia	Environ. Toxicol. Chem.14(2): 329-336	1995
18379	Adams,W.J., and B.B. Heidolph	Total	36	0.52	0.55	Short-Cut Chronic Toxicity Estimates Using Daphnia magna	ASTM Spec. Tech. Publ.:87-103	1985
3783	Adams,W.J., and B.B. Heidolph	Total	37	0.52	0.57	Short-Cut Chronic Toxicity Estimates Using Daphnia magna	ASTM Spec. Tech. Publ.:87-103	1985
10836	Adams,W.J., and B.B. Heidolph	Total	38	0.52	0.58	Short-Cut Chronic Toxicity Estimates Using Daphnia magna	ASTM Spec. Tech. Publ.:87-103	1985
4960	Gallego-Gallegos,M., L.E. Doig, J.J. Tse, I.J. Pickering, and K. Liber	Total	39	0.591	0.60	Bioavailability, Toxicity and Biotransformation of Selenium in Midge (Chironomus dilutus) Larvae Exposed via Water or Diet to Elemental Selenium Particles, Selenite, or Selenized Algae	Environ. Sci. Technol.47(1): 584-592	2013

Reference	Author	Concentration	Order	Concentration	% of	Title	Source	Publication
Number		Туре	oraci	concentration	Data			Year
4960	Kimball,G.	Total	40	0.68	0.62	The Effects of Lesser Known Metals and One Organic to Fathead Minnows (Pimephales promelas) and Daphnia magna	Manuscript, Department of Entomology, Fisheries and Wildlife, University of Minnesota, Minneapolis, MN:88 p.	1978
4960	Gallego-Gallegos,M., L.E. Doig, J.J. Tse, I.J. Pickering, and K. Liber	Total	41	0.762	0.63	Bioavailability, Toxicity and Biotransformation of Selenium in Midge (Chironomus dilutus) Larvae Exposed via Water or Diet to Elemental Selenium Particles, Selenite, or Selenized Algae	Environ. Sci. Technol.47(1): 584-592	2013
4960	Hoang,T.C., and S.J. Klaine	Dissolved	42	0.98	0.65	Influence of Organism Age on Metal Toxicity to Daphnia magna	Environ. Toxicol. Chem.26(6): 1198-1204	2007
4960	Hoang,T.C., and S.J. Klaine	Dissolved	43	0.98	0.66	Influence of Organism Age on Metal Toxicity to Daphnia magna	Environ. Toxicol. Chem.26(6): 1198-1204	2007
115478	Hoang,T.C., and S.J. Klaine	Dissolved	44	0.98	0.68	Influence of Organism Age on Metal Toxicity to Daphnia magna	Environ. Toxicol. Chem.26(6): 1198-1204	2007
115478	Hoang,T.C., and S.J. Klaine	Dissolved	45	0.98	0.69	Influence of Organism Age on Metal Toxicity to Daphnia magna	Environ. Toxicol. Chem.26(6): 1198-1204	2007
115478	Hoang,T.C., and S.J. Klaine	Dissolved	46	0.98	0.71	Influence of Organism Age on Metal Toxicity to Daphnia magna	Environ. Toxicol. Chem.26(6): 1198-1204	2007
115478	Hoang,T.C., and S.J. Klaine	Dissolved	47	0.98	0.72	Influence of Organism Age on Metal Toxicity to Daphnia magna	Environ. Toxicol. Chem.26(6): 1198-1204	2007
115478	Hoang,T.C., and S.J. Klaine	Dissolved	48	0.98	0.74	Influence of Organism Age on Metal Toxicity to Daphnia magna	Environ. Toxicol. Chem.26(6): 1198-1204	2007
115478	Hoang,T.C., and S.J. Klaine	Dissolved	49	0.98	0.75	Influence of Organism Age on Metal Toxicity to Daphnia magna	Environ. Toxicol. Chem.26(6): 1198-1204	2007
166945	Hoang,T.C., and S.J. Klaine	Dissolved	50	0.98	0.77	Influence of Organism Age on Metal Toxicity to Daphnia magna	Environ. Toxicol. Chem.26(6): 1198-1204	2007
166945	Hoang,T.C., and S.J. Klaine	Dissolved	51	0.98	0.78	Influence of Organism Age on Metal Toxicity to Daphnia magna	Environ. Toxicol. Chem.26(6): 1198-1204	2007
166945	Hoang,T.C., and S.J. Klaine	Dissolved	52	0.98	0.80	Influence of Organism Age on Metal Toxicity to Daphnia magna	Environ. Toxicol. Chem.26(6): 1198-1204	2007
166945	Hoang,T.C., and S.J. Klaine	Dissolved	53	0.98	0.82	Influence of Organism Age on Metal Toxicity to Daphnia magna	Environ. Toxicol. Chem.26(6): 1198-1204	2007
101846	Dunbar,A.M., J.M. Lazorchak, and W.T. Waller	Total	54	1	0.83	Acute and Chronic Toxicity of Sodium Selenate to Daphnia magna Straus	Environ. Toxicol. Chem.2(2): 239-244	1983
101846	Lawrence,S.G., and M.H. Holoka	Total	55	1.01	0.85	Effect of Selenium on Impounded Zooplankton in a Mercury Contaminated Lake	Can. Tech. Rep. Fish. Aquat. Sci.1151:83-92	1981
101846	Lawrence,S.G., and M.H. Holoka	Total	56	1.01	0.86	Effect of Selenium on Impounded Zooplankton in a Mercury Contaminated Lake	Can. Tech. Rep. Fish. Aquat. Sci.1151:83-92	1981

Reference Number	Author	Concentration Type	Order	Concentration	% of Data	Title	Source	Publication Year
101846	Lawrence,S.G., and M.H. Holoka	Total	57	1.01	0.88	Effect of Selenium on Impounded Zooplankton in a Mercury Contaminated Lake	Can. Tech. Rep. Fish. Aquat. Sci.1151:83-92	1981
101846	Lawrence,S.G., and M.H. Holoka	Total	58	1.01	0.89	Effect of Selenium on Impounded Zooplankton in a Mercury Contaminated Lake	Can. Tech. Rep. Fish. Aquat. Sci.1151:83-92	1981
101846	Lawrence,S.G., and M.H. Holoka	Total	59	1.01	0.91	Effect of Selenium on Impounded Zooplankton in a Mercury Contaminated Lake	Can. Tech. Rep. Fish. Aquat. Sci.1151:83-92	1981
101846	Jensen,P.D., M.A. Sorensen, W.E. Walton, and J.T. Trumble	Total	60	2	0.92	Lethal and Sublethal Responses of an Aquatic Insect Culex quinquefasciatus (Diptera: Culicidae) Challenged with Individual and Joint Exposure to Dissolved Sodium Selenate and Methylmercury Chloride	Environ. Toxicol.22(3): 287-294	2007
101846	Jensen,P.D., M.A. Sorensen, W.E. Walton, and J.T. Trumble	Total	61	2		Lethal and Sublethal Responses of an Aquatic Insect Culex quinquefasciatus (Diptera: Culicidae) Challenged with Individual and Joint Exposure to Dissolved Sodium Selenate and Methylmercury Chloride	Environ. Toxicol.22(3): 287-294	2007
101846	Jensen,P.D., M.A. Sorensen, W.E. Walton, and J.T. Trumble	Total	62	2	0.95	Lethal and Sublethal Responses of an Aquatic Insect Culex quinquefasciatus (Diptera: Culicidae) Challenged with Individual and Joint Exposure to Dissolved Sodium Selenate and Methylmercury Chloride	Environ. Toxicol.22(3): 287-294	2007
101846	Jensen,P.D., M.A. Sorensen, W.E. Walton, and J.T. Trumble	Total	63	2		Lethal and Sublethal Responses of an Aquatic Insect Culex quinquefasciatus (Diptera: Culicidae) Challenged with Individual and Joint Exposure to Dissolved Sodium Selenate and Methylmercury Chloride	Environ. Toxicol.22(3): 287-294	2007
101846	Jensen,P.D., M.A. Sorensen, W.E. Walton, and J.T. Trumble	Total	64	4	0.98	Lethal and Sublethal Responses of an Aquatic Insect Culex quinquefasciatus (Diptera: Culicidae) Challenged with Individual and Joint Exposure to Dissolved Sodium Selenate and Methylmercury Chloride	Environ. Toxicol.22(3): 287-294	2007
101846	Jensen,P.D., M.A. Sorensen, W.E. Walton, and J.T. Trumble	Total	65	8	1.00	Lethal and Sublethal Responses of an Aquatic Insect Culex quinquefasciatus (Diptera: Culicidae) Challenged with Individual and Joint Exposure to Dissolved Sodium Selenate and Methylmercury Chloride	Environ. Toxicol.22(3): 287-294	2007

Notes:

LOEClowest observable effect conceLOELlowest observable effect level

NOEC no observable effect concentra

NOEL no observable effect level

NR-ZERO No response

# Table I2-2: 96-h LC50 Concentrations for As3+ among Aquatic Invertebrates from the USEPA ECOTOX Database Corrective Action Site Investigation, Source Assessment, and Risk Assessment Report E.W. Brown Station, Herrington Lake, Mercer County, Kentucky

Species Group	Common Name	Scientific Name	LC50 Concentration mg/L	Author	Publication Year
	Scud	Gammarus pseudolimnaeus	0.875	Call,D.J., L.T. Brooke, N. Ahmad, and J.E. Richter	1983
Crustaceans	Scud	Hyalella azteca	1.6	Liber,K., L.E. Doig, and S.L. White- Sobey	2011
Clustaceans	Harpacticoid Copepod	Nitocra spinipes	3.5	Bengtsson, B.E., and B. Bergstrom	1987
	Harpacticoid Copepod	Nitocra spinipes	3.5	Bengtsson, B.E., and B. Bergstrom	1982
	Midge	Chironomus sp.	6.9	Jeyasingham,K., and N. Ling	2000
	Midge	Chironomus dilutus	7.1	Liber,K., L.E. Doig, and S.L. White- Sobey	2011
	Midge	Chironomus sp.	9.8	Jeyasingham,K., and N. Ling	2000
	Midge	Polypedilum sp.	13.6	Jeyasingham,K., and N. Ling	2000
	Midge	Chironomus sp.	15	Jeyasingham,K., and N. Ling	2000
	Midge	Chironomus sp.	16	Jeyasingham,K., and N. Ling	2000
	Chironomid	Chironomus zealandicus	16.2	Jeyasingham,K., and N. Ling	2000
	Midge	Chironomus sp.	17.3	Jeyasingham,K., and N. Ling	2000
	Midge	Polypedilum sp.	19.7	Jeyasingham,K., and N. Ling	2000
	Midge	Chironomus sp.	20.4	Jeyasingham,K., and N. Ling	2000
	Midge	Polypedilum sp.	21	Jeyasingham,K., and N. Ling	2000
	Midge	Polypedilum sp.	24.8	Jeyasingham,K., and N. Ling	2000
	Chironomid	Chironomus zealandicus	26.2	Jeyasingham,K., and N. Ling	2000
Aquatic Insects	Midge	Polypedilum sp.	26.6	Jeyasingham,K., and N. Ling	2000
Aquatic insects	Chironomid	Chironomus zealandicus	27.9	Jeyasingham,K., and N. Ling	2000
	Chironomid	Chironomus zealandicus	29.2	Jeyasingham,K., and N. Ling	2000
	Midge	Chironomus sp.	33.7	Jeyasingham,K., and N. Ling	2000
	Stonefly	Pteronarcys californica	38	Mayer, F.L., Jr., and M.R. Ellersieck	1986
	Midge	Polypedilum sp.	41.9	Jeyasingham,K., and N. Ling	2000
	Stonefly	Pteronarcys californica	45	Cope,O.B.	1965
	Chironomid	Chironomus zealandicus	60	Jeyasingham,K., and N. Ling	2000
	Chironomid	Chironomus zealandicus	63.4	Jeyasingham,K., and N. Ling	2000
	Chironomid	Chironomus zealandicus	70.4	Jeyasingham,K., and N. Ling	2000
	Midge	Polypedilum sp.	76.1	Jeyasingham,K., and N. Ling	2000
Aquatic Worm	Nematode	Caenorhabditis elegans	173	Williams, P.L., and D.B. Dusenbery	1990

Notes:

EC50 50 percent effect concentration

LC50 50 percent lethal concentration

mg/L milligrams per liter

LOEC lowest observable effect concentration

NOEC no observable effect concentration

### Table 12-3: Acute and Chronic Toxicity Data for As3+ Used to Derive Updated Acute-Chronic Ratios (ECOTOX Database) Corrective Action Site Investigation, Source Assessment, and Risk Assessment Report E.W. Brown Station, Herrington Lake, Mercer County, Kentucky

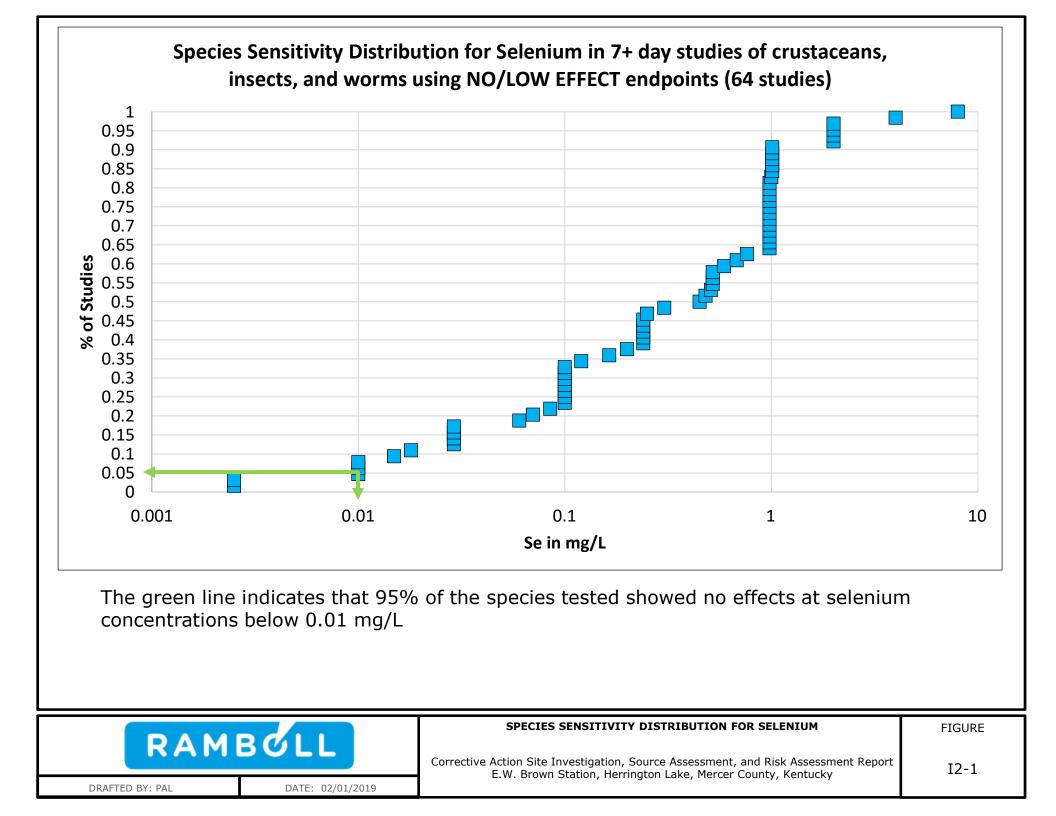
Species	Acute EC50 or LC50	Chronic NOEC - LOEC (Mean <sup>a</sup> )	Acute- Chronic Ratio	Species Mean Acute-Chronic Ratio	Reference
Cladoceran (Ceriodaphnia dubia)	1.448	0.793-1.636 (1.140)	1.27	1.3	Spehar and Fiandt, 1986
Cladoceran (Daphnia magna)	1.5	0.633 - 1.320 (0.914)	1.641	1 0	Lima et al. 1984
Cladoceran (Daphnia magna)	2.5	0.920-1.850 (1.305)	1.916	1.8	Tišler and Zagorc-Končan, 2002
Mysid (Mysidopsis bahia)	1.74	0.631 - 1.270 (0.895)	1.944	1.9	Lussier et al. 1985, from USEPA (1984)

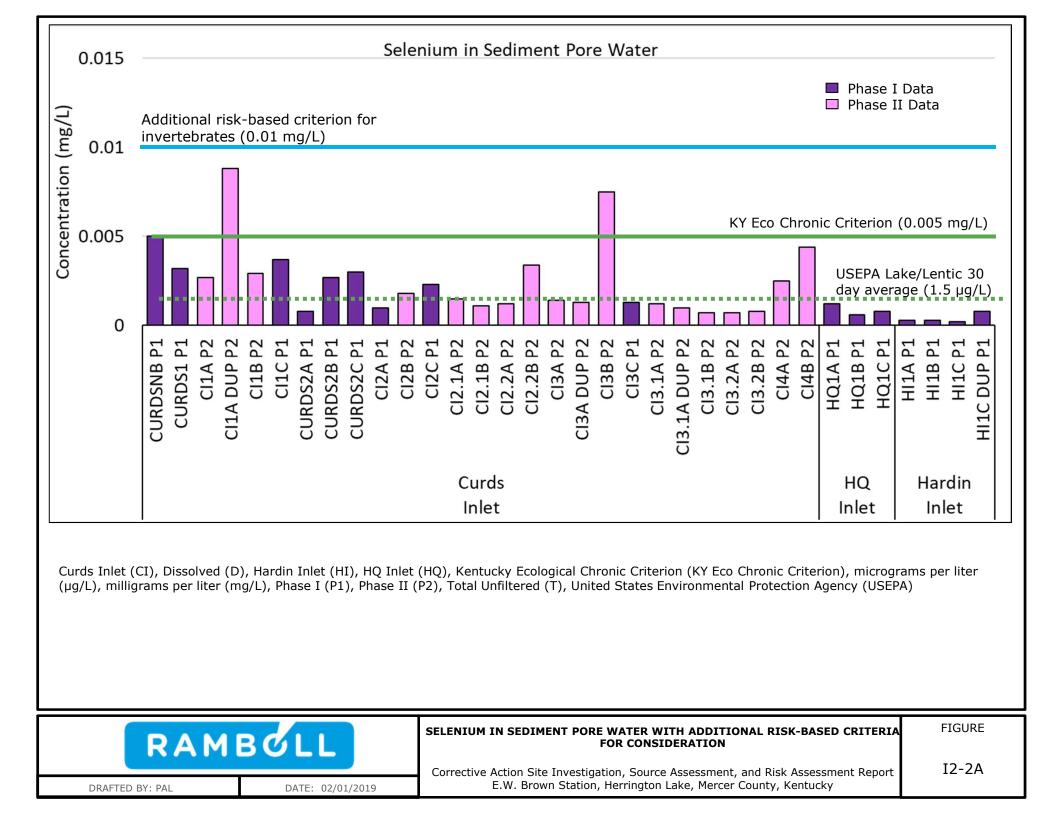
Geometric mean of most acutely sensitive species <sup>b</sup>: 1.6

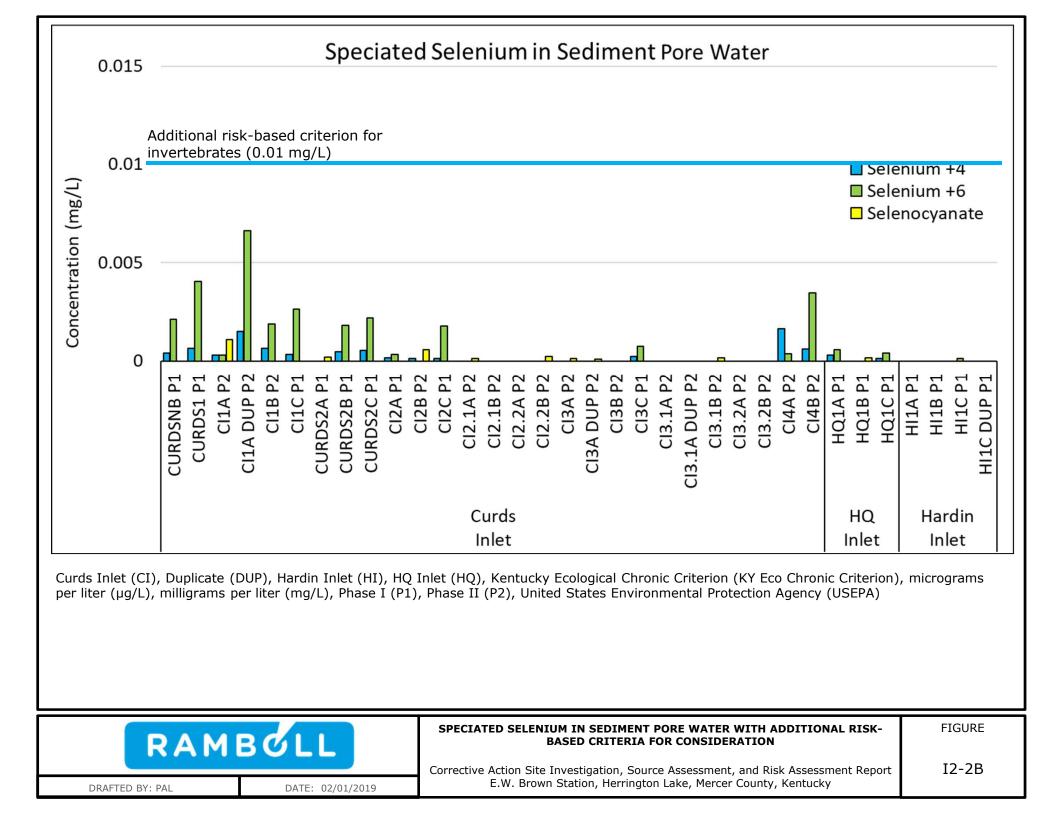
Notes:

- a Geometric mean of NOEC and LOEC used in calculation of acute-chronic ratio.
- b Based on procedures described in Stephen et al. (1985).
- EC50 50 percent effect concentration
- LC50 50 percent lethal concentration
- mg/L milligrams per liter
- LOEC lowest observable effect concentration
- NOEC no observable effect concentration

# **FIGURES**







#### **Arsenic in Sediment Pore Water** 2.5 As (1632A) 2.0 Concentration (mg/L) As (E200.8) 1.5 1.0 Additional risk-based criterion for invertebrates (0.534 mg/L) 0.5 USEPA Region 4 Chronic Value for Arsenic III (0.148 mg/L) 0.0 CI4A P2 CI4B P2 CI3A P2 HQ1A P1 Ρ1 P2 P2 P2 P1 Ρ1 P Ρ1 P2 P1 P2 P2 P2 P2 P2 P2 P1 P2 CI3.2A P2 HQ1B P1 HI1C P1 CURDS1 P1 P1 CI3.1A P2 CI3.1B P2 CI3.2B P2 Ρ1 P1 Б Б CI1C | CI2A I CI2.1B F CI2.2A F CI2.2B F CI3B | HQ1C | HI1A F HI1B I CI1B CI2B CI2C CI2.1A | CI3C | CI1A CI1A DUP **CI3A DUP** CI3.1A DUP C DUP CURDSNB **CURDS2A** CURDS2B **CURDS2C** ΗI

Arsenic (As), Curds Inlet (CI), Dissolved (D), Duplicate (Dup), Environmental Protection Agency (EPA), EPA Method 1632A (1632A), EPA Method 200.8 (E200.8), Hardin Inlet (HI), HQ Inlet (HQ), milligrams per liter (mg/L), Phase I (P1), Phase II (P2), United States Environmental Protection Agency (USEPA)

Curds

Inlet



DATE: 02/01/2019

#### ARSENIC IN SEDIMENT PORE WATER WITH ADDITIONAL RISK-BASED CRITERIA FOR CONSIDERATION

FIGURE

Hardin

Inlet

HQ

Inlet

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