Hylebos Waterway Fish Injury Studies Individual Data and Quality Assurance Results CASE NARRATIVE

Reproductive Injury in Flatfish Ovarian Histopathology

Histopathologist's qualifications

Histologic sections of gonad from individual fish were examined by three histopathologists (Mark Myers, Carla Stehr, Paul Olson) with at least three years of experience in the histopathologic examination of English sole and rock sole. The latter two examiners have completed a one-year training program under the direction of the chief pathologist, Mark S. Myers. Each histopathologist examined approximately 33% of the total number of cases.

Diagnostic criteria

Criteria for microscopic lesion diagnosis were adopted from comparative pathology textbooks (Robbins, Cotran, and Kumar, 1984) and various publications in fish histopathology (Myers et al., 1987; Moore and Myers, 1994; Johnson et al., 1991; Hinton et al., 1992).

Histologic slide labeling

All histologic slides were labeled with a random number code so that the geographic site of capture was not known to the examiner.

Internal quality control procedures for histologic slide ezamination

For histologic slides examined by Carla Stehr and Paul Olson affected with suspected or diagnosed liver lesions, or where liver lesion diagnosis was not obvious, all tissues, including ovaries, were re-exammed by the chief pathologist, Mark Myers. Additionally, ovaries from 20 additional specimen were chosen at random for re-examination. Out of the approximately 269 tissues sections of gonad examined (from 269 individual English sole), 38 tissue sections or 14% of samples were re-examined by the chief pathologist. The original and final, confirmed diagnoses for these re-examined individual cases are set forth in Table 1.

Coding of diagnoses into database

Each final histopathologic diagnosis was entered into the database by the examining histopathologist, using a lesion coding system developed at the Northwest Fisheries Science Center. Lesion categories include the following:

-atresia of yolked oocytes -atresia of non-yolked oocytes -late stage atresia -inflammation in the ovary

Missing data

Occasionally the cassette used to hold tissues from individual fish will open up in the fixative container, resulting in the loss of the tissue; also, in the necropsy procedure, occasionally tissues are inadvertently not collected. Infrequent labeling errors may also occur during the handling of a large number of fish. If the tissue is lost, or there is a question about the labeling, lesion information is not used, and missing data for **a** particular tissue is indicated by a blank record. Specimens collected for these studies, but where histopathology data is not available are:

943374, 943531, 943562, 943742, 943806, 943843, 943281, 943293, 043296, 943572, 943651,943732,943761,943806,943843

Otoliths are sometimes lost or damaged during collection; therefore age data cannot be obtained. This missing data is indicated by a blank record. Fish where we were unable to obtain age data were specimens 943350 and 943649.

Sequential gaps in the specimen numbers do not represent missing fish. Those specimens listed in Table 2 are female English sole reported in the Reproductive Injury study. Specimen number not listed were either reported in the Toxicopathic Injury study, or assigned to other projects.

Revisions 2/24/97

The data presented in this case narrative were previously included in with liver and kidney data as part of the Toxicopathic Injury study case narrative submitted on 5/30/96. However, since detailed data on the histopathology of ovarian lesions in English sole is only reported in the Reproductive Injury Interpretive Report, this information now appears here in a separate document. In addition to information on ovarian lesion occurrence, this case narrative also includes ovarian lesion severity rankings. Data on ovarian Quality Assurrance has been expanded; slides from 20 additional female English sole collected specifically for the Reproductive Injury study were randomly selected and reread by the chief pathologist. No additional changes to lesion diagnoses or other information contained in the case narrative were made.

Documentation and Abbreviations for Tables 1 and 2 Ovarian Histopathology Data for Hylebos Flatfish Reproductive Injury Study

This case narrative includes ovarian histopathology for flatfish collected during the Reproductive Injury Study of the Hylebos Fish Injury Studies, Phase I. Other histopathology data for these fish are presented in for liver and kidney histopathology case narrative for flatfish collected during the Toxicopathic and Reproductive Injury Studies.

Notes and Abbreviations

Date collected - data fish were caught, and tissue samples collected

<u>**Reader**</u>- indicates last name of the person who read the histopathology slides for that specimen number. A blank record occurs when no tissue sections were available to be read for that specimen.

Ovary lesions

YATR = early stage (alpha) atresia of yolked oocytes YATRsev = severity rating for early stage atresia. of yolked oocytes NYATR = early stage (alpha) atresia of non-yolked oocytes NYATRsev = severity rating for early stage atresia. of non-yolked oocytes LATR = late stage atresia, (can't distinguish yolked from non-yolked at this stage) LATRsev severity rating for late stage atresia OVINFL = inflammation in the ovary OVINFLsev = severity rating for inflammation in the ovary

Gonad stages

OVSTAGE = stage of maturation of the ovary

Age:

Actual years of age as indicated by growth rings on otoliths. Blank records indicate no age data available; otoliths lost or damaged.

Sex:

1 = male2 = female

Length: total length, reported in millimeters

Weight: total weight, reported in grams

Explanation of codes

Presence or absence of lesions:

0= tissue examined, no lesion observed 1= tissue examined, lesion observed blank = tissue not examined

Lesion severity:

- 0 = absent
- 1 = minimal, sparse, very few
- 2 = minimal to mild
- 3 = mild, few
- 4 =mild to moderate, several
- 5 = moderate, moderate number
- 6 = moderate to severe
- 7 = severe, abundant, numerous, dense
- 8 = excessive amount or number, excessively dense blank = tissue not examined

Stage of Maturation of the Ovary

- 1 = regressed; oogonia and primary oocytes
- 2 =late regressed; secondary oocytes
- 3 = previtellogenic; vacuolated secondary oocytes
- 4 = vitellogenic
- 5 = some hydrated oocytes; no post-ovulatory follicles (POFs)
- 6 = spawning; hydrated oocytes with POFs
- 7 = spawned out
- 8 = equivocal spawn out; characteristics of spent fish but no identifiable POFs

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		alpha atresia,yolked 2/1	alpha atresia,yolked 3/1
94-3284 English	sole Olson	Novary: stage 3; alpha atresia, non-yolked 1/1	Ovary: stage 3; alpha atresia, non-yolked 1/1
94-3294 English	sole Stehr	Ovary: stage 3; late stage atresia 1/2; microsporidans	Ovary: stage 3; late stage atresia 1/1; microsporidans
94-3302 English	sole Stehr	· Ovary: stage 4	Ovary: stage 4
94-3303 English	sole Stehr	· Ovary: stage 3	Ovary: stage 3
94-3306 English	sole Stehr	Ovary: stage 3	Ovary: stage 3
94-3366 English	sole Stehr	· Ovary: stage 4	Ovary: stage 4
94-3369 English	sole Olson	Ovary: stage 3; serosal larval trematodes;	Ovary: stage 3; serosal larval trematodes;
		alpha atresia, non-yolked,1/1	alpha atresia, non-yolked,1/1
94-3383 English	sole Olson	Ovary: stage 4	Ovary: stage 4
94-3398 English	sole Olson	Ovary: stage 3	Ovary: stage 3
94-3408 English	sole Olson	Ovary: stage 4	Ovary: stage 4
94-3415 English	sole Olson	Ovary: stage 4; alpha atresia, yolked 1/1	Ovary: stage 4; alpha atresia, yolked 2/2
94-3466 English	sole Stehr	Ovary: stage 4	Ovary: stage 4
94-3515 English:	sole Stehr	Ovary: stage 4	Ovary: stage 4
94-3525 English:	sole Olson	Ovary: stage 4; alpha atresia, yolked 1/1	Ovary: stage 4; alpha atresia, yolked 1/1
94-3535 English :	sole Olson	Ovary: stage 2; alpha atresia,non-yolked 4/4	Ovary: stage 2; alpha atresia, non-yolked 3/4
94-3541 English	sole Olson	Ovary: stage 3; alpha atresia, non-yolked 2/1	Ovary: stage 3; alpha atresia, non-yolked 2/1
94-3565 English (sole Olson	Ovary: stage 4;alpha atresia, yolked 1/1	Ovary: stage 4;alpha atresia, yolked 1/1
94-3574 English :	sole Stehr	Ovary: stage 4	Ovary: stage 4
94-3575 English :	sole Olson	Ovary: stage 3; late stage atresia 3/3; alpha atresia,	Ovary: stage 3; late stage atresia 3/3; alpha atresia,
		non-yolked 4/4	non-yolked 4/4
94-3576 English :	sole Olson	Ovary: stage 4	Ovary: stage 4
94-3577 English &	tole Olson	Ovary: stage 4; late stage atresia 2/1; alpha atresia,	Ovary: stage 4; late stage atresia 1/1; alpha atresia,
		yolked 3/3; alpha atresia, non-yolked 1/1	yolked 3/2; alpha atresia, non-yolked 1/1
94-3586 English s	ole Stehr	Ovary: stage 3; late stage atresia 2/1	Ovary: stage 3; late stage atresia 2/1
94-3588 English s	sole Olson	Ovary: stage 3, atresia	Ovary: stage 3, atresia
94-3590 English s	ole Stehr	Ovary: stage 4	Ovary: stage 4
94-3617 English s	ole Stehr	Ovary: stage 4; alpha atresia, yolked 4/2; alpha	Ovary: stage 4; alpha atresia, yolked 2/2; alpha
		atresia, non-yolked 4/2	atresia, non-yolked 3/2

Table 1. Ovarian Pathology Cases Subjected to Quality Assurance, Hylebos Damage Assessment

Post QA Final Diagnoses	Overv: stand 7: post ovulatory follicles (POFs) 4/3;	Utary, utage 1, For the data atracia	late stage attesta, yuikeu 1/1, tate stage attesta,	non-yolked 4/2	Ovary: stage 4; alpha atresia, yolked 5/6; alpha	atresia, non-yolked 3/2	Ovary: stage 4; alpha atresia, yolked 3/5; alpha	atresia, non-yolked 3/3; late stage atresia 2/1	Ovary: stage 4; alpha atresia, yolked 3/2; late stage	atresia 2/1	Ovary: stage 4; alpha atresia, non-yolked 3/2	Ovary: stage 2; late stage atresia 1/1	Ovary: stage 7; POFs 4/4; late stage atresia 3/3	Ovary: stage 7; POFs 2/2; late stage atresia 2/1;	alpha atresia, non-yolked 3/2	Ovary: stage 8; alpha atresia, yolked 2/1; late stage	atresia 3/2	Ovary: stage7; POFs 4/2; late stage atresia 3/6 6	Ovary: stage7; POFs 4/5; late stage atresia 4/4	Ovary: stage 2; alpha atresia, yolked 2/2	
Orthinal Nagpoeae		Uvary: stage /; post ovulatory ioliticies (rural 4/3,	late stage atresia, yolked 1/1; late stage atresia,	non-volked 4/2	Ovary: stade 4: aloha atresia, volked 5/6; alpha	atracia non-volkad 3/2	Ovarv: starte 4: alpha atresia. volked 4/5; alpha	atracia non-volked 2/2: late stade atresia 1/1	Ovarv: stade 4: alpha atresia. volked 1/1; late stage	atrosia 1/1	Ovarv: stane 4: atoha atresia.non-volked 3/2	Overvit etane 2º late stane atresia 1/1	Overy: stare 7. DDFc 4/4. late stare atresia 3/3	Ovary, stage 7, 10, 5, 1, 1, 1, 1, 1, 2, 2, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1,	Utally. Stage 1, 1 Of a 24, 140 Stage uncomendation	Ovarv: starte 8: alpha atresia.volked 2/1; late stage	atracia 3/9	Overv. stand7. POFs 4/2: late stade atresia 3/6	Ovary, studyof, the stand atresia 4/4	Ovary: stage 2; alpha atresia, yolked 3/2	
	Meader	Stehr			Olson		Oleon	10202	Stahr		Oleon	Ciode Ciode Ciode	01011 010	01011	Stenr	Oleon	520	Ctohr	100	Olson	
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Sex Length_mrtWeight_g Age Species	2 277 211 3 English	2 261 183 3 English	2 272 161 3 English	2 282 214 3 English	2 237 138 1 Englist	2 302 235 3 Englist	2 326 300 7 Englist	2 264 152 2 Englist	2 312 270 3 Englist	2 293 203 3 Englist	2 264 152 3 English	2 338 358 5 English	2 265 142 3 Englist	2 348 359 11 Englist	2 299 243 3 Englis	2 340 334 4 Englis	2 350 350 6 Englist	2 294 235 3 English	2 352 364 8 Englist	2 337 305 7 Englist	2 351 378 5 Englis	2 318 292 5 English	2 354 419 5 Englist	2 298 216 5 Englis	2 309 262 5 Englist	2 335 310 7 Englist	2 308 257 3 English	2 209 200 3 English	2 276 194 3 English	2 274 190 2 English	2 282 180 3 English	2 298 234 5 English	2 291 206 3 English	2 255 144 3 English	2 310 245 3 English	2 320 281 6 English	2 300 242 6 English	2 300 216 4 English	2 374 536 9 English	2 300 239 5 Endish
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Specimen # Date collected Sex ength_mn/Weight_g Age Species	943391 10/18/94 2 277 211 3 Engish	943392 10/18/94 2 261 183 3 Englist	943393 10/18/94 2 272 181 3 English	943398 10/18/94 2 282 214 3 English	943400 10/18/94 2 237 138 1 Englist	943401 10/18/94 2 302 235 3 Englist	943402 10/19/94 2 326 300 7 Engist	943403 10/19/94 2 264 152 2 Englist	943404 10/19/94 2 312 270 3 Englist	943405 10/19/94 2 293 203 3 Englist	943407 10/19/94 2 264 152 3 Engist	943408 10/19/94 2 338 358 5 English	943410 10/19/94 2 265 142 3 Englist	943411 10/19/94 2 348 359 11 Englist	943412 10/19/94 2 299 243 3 Englis	943413 10/19/94 2 340 334 4 Englis	943414 10/19/94 2 350 350 6 Englist	943415 10/19/94 2 294 235 3 English	943466 10/20/94 2 352 364 8 Englist	943467 10/20/94 2 337 305 7 English	943468 10/20/94 2 351 378 5 Englis	943469 10/20/94 2 318 292 5 Englis	943493 10/25/94 2 354 419 5 Englist	943494 10/25/94 2 298 216 5 Englis	943496 10/25/94 2 309 262 5 Englist	943497 10/25/94 2 335 310 7 Englis	943498 10/25/94 2 308 257 3 English	943499 10/25/94 2 209 200 3 English	943500 10/25/94 2 278 194 3 English	943501 10/25/94 2 274 190 2 English	943502 10/25/94 2 282 180 3 English	943503 10/25/94 2 298 234 5 English	943504 10/25/94 2 291 206 3 English	943514 12/2/94 2 255 144 3 English	943515 12/2/94 2 310 245 3 English	943516 12/2/94 2 320 281 6 English	943518 12/2/94 2 300 242 6 English	943520 12/2/94 2 300 216 4 English	943521 12/2/94 2 374 536 9 English	012603 19/9/04 2 300 239 5 Endish
Site Specimen # Date collected Sex ength_mn[Weight_g Age Species	Hylebos 943391 10/18/94 2 277 211 3 English	Hylebos 943392 10/18/94 2 261 183 3 English	Hylebos 943393 10/18/94 2 272 181 3 English	Hylebos 943398 10/18/94 2 282 214 3 English	Hylebos 943400 10/16/94 2 237 138 1 Englis	Hylebos 943401 10/18/94 2 302 235 3 Englist	Colvos 943402 10/19/94 2 326 300 7 Englist	Colvos 943403 10/19/94 2 264 152 2 Englist	Colvos 943404 10/19/94 2 312 270 3 Englist	Colvos 943405 10/19/94 2 293 203 3 Englist	Colvos 943407 10/19/94 2 264 152 3 Englist	Colvos 943408 10/19/94 2 338 358 5 English	Colvos 943410 10/19/94 2 265 142 3 Englist	Colvos 943411 10/19/94 2 348 359 11 English	Colvos 943412 10/19/94 2 299 243 3 Englis	Colvos 943413 10/19/94 2 340 334 4 Englis	Colvos 943414 10/19/94 2 350 350 6 Englist	Colvos 943415 10/19/94 2 294 235 3 English	Colvos 943466 10/20/94 2 352 364 8 Englist	Colvos 943467 10/20/94 2 337 305 7 English	Colvos 943468 10/20/94 2 351 378 5 Englis	Colvos 943469 10/20/94 2 318 292 5 Englis	Colvos 943493 10/25/94 2 354 419 5 Englist	Colvos 943494 10/25/94 2 298 216 5 Englis	Colvos 943496 10/25/94 2 309 262 5 Englist	Colvos 943497 10/25/94 2 335 310 7 Englis	Colvos 943498 10/25/94 2 308 257 3 Englis	Colvos 943499 10/25/94 2 209 200 3 English	Colvos 943500 10/25/94 2 278 194 3 English	Colvos 943501 10/25/94 2 274 190 2 English	Colvos 943502 10/25/94 2 282 180 3 English	Colvos 943503 10/25/94 2 298 234 5 English	Colvos 943504 10/25/94 2 291 206 3 English	Colvos 943514 12/2/94 2 255 144 3 English	Colvos 943515 12/2/94 2 310 245 3 English	Colvos 943516 12/2/94 2 320 281 6 English	Colvos 943518 12/2/94 2 300 242 6 English	Colvos 943520 12/2/94 2 300 216 4 English	Colvos 943521 12/2/94 2 374 536 9 English	Colored 042623 19/9/04 2 300 239 5 Endish

-	Site	Specimen #	Date collected	Sex	Length_mn	Weight 5	Age	Species	OVSTAGE	YATR	YATRsev	NYATR	NYATRsev	LATR	LATREEV	OVINEL	OVINEI SAV
_	Colvos	943524	12/2/94	~	297	214	4	English	0	0	0	-	1	•	0	0	0
- T	Colvos	943525	12/2/94	2	352	353	8	English	+	-	1	0	0	0	0		e
T	Colvos	943526	12/2/94	2	271	173	3	English	2	0	0	-	e	0	0	0	0
T	Colvos	943527	12/2/94	8	295	262	S	English	4	-	2	0	0	0	0	0	0
T	Colvos	943529	12/2/94	2	340	380	7	English	4	0	0	•	0	0	0	0	0
T	Colvos	943530	12/2/94	8	280	199	9	English	2	0	0	-	S	0	0	0	0
T	Colvos	943531	12/2/94	2	300	242	9	English									
T	Colvos	943532	12/2/94	2	286	195	9	English									
	Colvos	943533	12/2/94	2	351	416	<u>°</u>	English	-	0	0	0	0	0	0	•	0
	Colvos	943534	12/2/94	8	306	254	60	English	-	0	0	0	0	0	0	0	0
	Colvos	943535	12/2/94	2	279	188	3	English	2	0	0	-	•	0	0	-	
	Colvos	943536	12/2/94	2	295	242	9	English	9	0	0	-	-	0	0	0	0
	Colvos	943537	12/2/94	8	301	236	e	English	•	-	2	•	0	0	0	0	0
	Colvos	943538	12/2/94	2	294	236	4	English	4	0	0	0	0	•	0	0	0
	Colvos	943539	12/2/94	8	277	180	с С	English	2	0	0		0	0	0	0	0
-	Colvos	943540	12/2/94	2	295	216	S	English	+	-	0		0	-	-	0	0
\neg	Colvos	943541	12/2/94	2	301	219	0	English	9	0	0	-	-	0	0	-	1
1	Colvos	943542	12/2/94	~	283	188	0	English	80	0	0	-	-	0	0	0	0
	Colvos	943543	12/2/94	~	290	192	3	English	B	0	0	-	6	0	0	0	0
	Colvos	943544	12/2/94	2	285	172	9	English	9	0	0	-	8	0	0	0	0
+	Hylebos	943546	12/5/94	~	355	433	2	English	-	0	0	0	0	0	0	0	0
+	Hylebos	943548	12/5/94	~	305	250	2	English	-	•	0	0	0	+	•	-	8
\neg	Hylebos	943550	. 12/5/94	~	265	174	е	English	4	•	0	0	0	0	0	0	0
	Hylebos	943552	12/5/94	~	305	249	8	English	4	-	8	0	0	0	0	0	0
-	Hylebos	943554	12/5/94	~	342	348	5	English	9	•	0	0	0	0	0	0	0
-+	Hylebos	943558	12/5/94	~	310	301	4	English	-	•	0	0	0	0	0	0	0
	Hylebos	943560	12/5/94	~	400	514	S	Engish	4	-	-	0	0	0	0	0	0
\neg	Hylebos	943562	12/5/94	2	356	401	2	English									
\neg	Hylebos	943564	12/5/94	~	330	338	~	English	-	0	0	0	0	0	0	0	0
	Hylebos	943565	12/5/94	2	382	569	5	Engish	4	-	-	0	٥	0	0	0	0
	Hylebos -	943566	12/5/94	8	289	217	9	English	e	0	0	0	0	0	0	0	0
_	Hylebos	943567	12/5/94	~	289	228	3	English	4	0	0	0	0	0	0	0	0
_	Hylebos	943568	12/5/94	~	252	152	9	English	4	0	0	0	0	0	0	0	0
	Hylebos	943569	12/5/94	2	328	325	4	English	4	-		0	0	0	0	0	0
	Hylebos	943572	12/6/94	8	274	167	0	English									
	Hylebos	943574	12/6/94	2	304	270	S	English	-	0	0	Q	0	0	0	0	0
	Hylebos	943575	12/6/94	3	365	406	0	English	9	0	0	-	4	-	6	-	e
-	Hylebos	943576	12/6/94	~	285	203	6	English	-	•	0	0	0	0	0	-	5
	Hylebos	943577	12/6/94	~	297	258	0	English	-	-	e		-	1	-	0	0
-	Hylabos	943578	12/6/94	~	247	131		English	~	•	•	•	•	-	-	0	0

	Study
	Injury
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	Histopathology
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1.5											_		_	_			_				_																			
OVINFLEE	3	0	4	4	0	0	0	0	0	0	9	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	8	0	0	2	0	9	0	0	0	0	0	0	giolog
OVINFL	-	0	-	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	-	0	0	-	0	-	0	0	0	0	0	0	
LATRsev	0	-	0	-	0	0	0	1	0	0	0	0	4	0	2	0	4	0	0	0	0	3	0	-	•	0	8	0	2	9	0	0	-	0	0	0	-	8	0	·
LATR	0	+	0	-	0	0	0	-	0	0	0	0	-	0	1	0	-	0	0	0	0	-	0		0	0	-	0	-	-	•	0	-	0	0	0	•	-	0	
NYATRSev	0	0	2	0	0	0	0	0	0		1	9	3	0	0	1	0	0	0	0	8	1	0	2	0	0	0	8	0	•	2	4	0	5	0	0	0	2	4	
NYATR	0	0	-	0	0	0	0	0	0	-	1	-	Ļ	0	0	1	0	0	0	•	-	-	0	-	0	0	0	-	0	0	-	-	0	-	•	0	0	-	-	
YATRsev	0	0	0	0	0	0	0	0	1	e	0	0	0	0	0	0	0	-	8	0	0	0	0	2	1	0	0	0	0	0	9	e	0	0	0	0	0	0	9	L.
YATR	0	0	0	0	0	0	0	0	-	-	0	0	0	0	0	0	0	-	-	0	0	0	0	1	1	0	0	•	0	•	-	-	0	0	0	0	0	0	-	
OVSTAGE	4	3	5	3	3	4	4	4	4	4	4	2	3	4	2	3	8	4	4	4	-	8	4	4	4	~	~	4	8	~	4	8	8	2	4	4	9	2	*	-
-				-										-	-	-	-		-		ء	_		-	E	_	_												+	
Specie	English	English	English	Englis	Englist	English	Englist	English	English	English	English	English	Englist	Englist	English	Englist	Englist	Englist	Englist	Englist	Englis	Englis	Englist	Englist	Englis	Englis	English	English	Engis	English	English	English	English	English	English	English	English	English	English	Englist
Age Species	6 English	8 English	9 English	7 Englist	2 Englist	2 Englist	5 English	6 English	4 English	4 English	6 English	6 English	9 Englist	7 Englist	6 Englisi	7 Englist	4 Englist	2 Englist	5 Englist	4 Englist	6 Englis	4 Englis	6 Englist	11 Englist	6 Englis	5 Englist	10 English	6 Englist	5 Englist	12 English	12 English	7 English	7 English	11 English	3 English	2 English	3 English	English	6 English	6 Englist
Weight_g Age Specie	302 6 English	481 8 English	292 9 English	375 7 Englist	153 2 Englist	170 2 Englist	545 5 English	208 6 English	218 4 English	210 4 English	280 6 English	322 6 English	347 9 Englist	301 7 Englist	190 6 Englist	232 7 Englist	179 4 Englist	163 2 Englist	300 5 Englist	390 4 Englist	302 6 Englis	212 4 Englis	481 6 Englist	38.1 11 Englist	304 6 Englis	220 5 Englist	252 10 Englist	243 6 English	206 5 Englist	625 12 English	438 12 English	382 7 English	359 7 English	271 11 English	306 3 English	205 2 English	142 3 English	115 English	325 6 English	235 6 Englist
ength_mrtWeight_g Age Specie	328 302 6 English	380 481 8 English	32.5 292 9 English	348 375 7 Englist	257 153 2 Englist	268 170 2 Englist	378 545 5 Englist	282 208 6 English	312 218 4 English	270 210 4 English	299 280 6 English	330 322 6 Englist	352 347 9 Englist	324 301 7 Englist	270 190 6 Englis	288 232 7 Englist	272 179 4 Englist	258 163 2 Englist	316 300 5 Englist	335 390 4 Englist	311 302 6 Englis	300 212 4 Englis	360 481 6 Englist	340 381 11 Englist	329 304 6 Englis	297 220 5 Englis	336 252 10 English	290 243 6 English	285 206 5 Englist	415 625 12 English	360 438 12 English	365 382 7 English	345 359 7 English	330 271 11 English	320 306 3 English	275 205 2 English	260 142 3 English	250 115 English	332 325 6 English	320 235 6 Englist
Sex Length_mriWeight_g Age Specie	2 328 302 6 English	2 380 481 8 English	2 32.5 292 9 English	2 348 375 7 Engist	2 257 153 2 Englist	2 268 170 2 English	2 378 545 5 English	2 282 208 6 English	2 312 218 4 English	2 270 210 4 English	2 299 280 6 Englist	2 330 322 6 Englist	2 352 347 9 Englist	2 324 301 7 Englist	2 270 190 6 Englist	2 288 232 7 Englist	2 272 179 4 Englist	2 258 163 2 English	2 316 300 5 Englist	2 335 390 4 Englist	2 311 302 6 Englis	2 300 212 4 Englis	2 360 481 6 Englist	2 340 381 11 English	2 329 304 6 Englis	2 297 220 5 Englist	2 338 252 10 English	2 290 243 6 Englist	2 285 206 5 Englist	2 415 625 12 English	2 360 438 12 English	2 365 382 7 English	2 345 359 7 English	2 330 271 11 English	2 320 306 3 English	2 275 205 2 English	2 260 142 3 English	2 250 115 English	2 332 325 6 English	2 320 235 6 Englist
Date collected Sex Length_mriWeight_g Age Specie	12/6/94 2 328 302 6 English	12/6/94 2 380 481 8 English	12/6/94 2 325 292 9 English	12/6/94 2 348 375 7 Englis	12/6/94 2 257 153 2 Englist	12/6/94 2 268 170 2 Englist	12/6/94 2 378 545 5 Engist	12/6/94 2 282 208 6 English	12/6/94 2 312 218 4 English	1/4/95 2 270 210 4 English	1/4/95 299 280 6 English	1/4/95 2 330 322 6 Englist	1/4/95 2 352 347 9 Englist	1/4/95 2 324 301 7 Englist	1/4/95 2 270 190 6 Englis	1/4/95 288 232 7 Englist	1/4/95 272 179 4 Englist	1/4/95 258 163 2 Englist	1/4/95 2 316 300 5 Englist	1/4/95 2 335 390 4 English	1/4/95 2 311 302 6 Englis	1/4/95 2 300 212 4 Englis	1/5/95 2 360 481 6 Englist	1/5/95 2 340 381 11 Englist	1/5/95 2 329 304 6 Englis	1/5/95 2 297 220 5 Englis	1/5/95 2 338 252 10 English	1/5/95 2 290 243 6 English	1/5/95 2 285 206 5 Englist	1/5/95 2 415 625 12 English	1/5/95 2 360 438 12 English	1/5/95 2 365 382 7 English	1/5/95 2 345 359 7 English	1/5/95 2 330 271 11 English	1/5/95 2 320 306 3 English	1/5/95 2 275 205 2 English	1/5/95 2 260 142 3 English	1/5/95 2 250 115 English	1/6/95 2 332 325 6 English	1/6/95 2 320 235 6 Englist
Specimen # Date collected Sex Length_mriWeight_d Age Specie	943581 12/6/94 2 328 302 6 English	943586 12/6/94 2 380 481 8 Engist	943587 12/6/94 2 325 292 9 English	943588 12/6/94 2 348 375 7 Engis	943589 12/6/94 2 257 153 2 Englist	943590 12/6/94 2 268 170 2 Englist	943591 12/6/94 2 378 545 5 Englist	943592 12/6/94 2 282 208 6 English	943594 12/6/94 2 312 218 4 Englist	943595 1/4/95 2 270 210 4 English	943596 1/4/95 2 299 280 6 Englist	943598 1/4/95 2 330 322 6 Englist	943600 1/4/95 2 352 347 9 Englist	943602 1/4/95 2 324 301 7 Englist	943603 1/4/95 2 270 190 6 Englis	943604 1/4/95 2 288 232 7 Englist	943605 1/4/95 2 272 179 4 Englist	943607 1/4/95 2 258 163 2 English	943615 1/4/95 2 316 300 5 Englist	943616 1/4/95 2 335 390 4 Englist	943617 1/4/95 2 311 302 6 Englis	943618 1/4/95 2 300 212 4 Englis	943628 1/5/95 2 360 481 6 Englist	943629 1/5/95 2 340 381 11 Englis	943630 1/5/95 2 329 304 6 Englis	943631 1/5/95 2 297 220 5 Englis	943632 1/5/95 2 338 252 10 English	943633 1/5/95 2 290 243 6 English	943634 1/5/95 2 285 206 5 Englist	943635 1/5/95 2 415 625 12 English	943636 1/5/95 2 360 438 12 English	943637 1/5/95 2 365 382 7 English	943639 1/5/95 2 345 359 7 English	943644 1/5/95 2 330 271 11 English	943645 1/5/95 2 320 306 3 English	943647 1/5/95 2 275 205 2 English	943648 1/5/95 2 260 142 3 English	943649 1/5/95 2 250 115 English	943650 1/6/95 2 332 325 6 English	943651 1/6/95 2 320 235 6 Englist
Site Specimen # Date collected Sex Length_mriWeight_g Age Specie	Hylebos 943581 12/6/94 2 328 302 6 English	Hylebos 943586 12/6/94 2 380 481 8 English	Hylebos 943587 12/6/94 2 325 292 9 English	Hylebos 943588 12/6/94 2 348 375 7 Englis	Hylebos 943589 12/6/94 2 257 153 2 Englist	Hylebos 943590 12/6/94 2 268 170 2 English	Hylabos 943591 12/6/94 2 378 545 5 Englist	Hylebos 943592 12/6/94 2 282 208 6 English	Hylebos 943594 12/6/94 2 312 218 4 Englist	Hylebos 943595 1/4/95 2 270 210 4 English	Hylebos 943596 1/4/95 2 299 280 6 English	Hylebos 943598 1/4/95 2 330 322 6 Englist	Hylebos 943600 1/4/95 2 352 347 9 Englist	Hylebos 943602 1/4/95 2 324 301 7 Englist	Hylebos 943603 1/4/95 2 270 190 6 Englis	Hylebos 943604 1/4/95 2 288 232 7 English	Hylebos 943605 1/4/95 2 272 179 4 English	Hylebos 943607 1/4/95 2 258 163 2 English	Hylebos 943615 1/4/95 2 316 300 5 Englist	Hylebos 943616 1/4/95 2 335 390 4 English	Hylebos 943617 1/4/95 2 311 302 6 Englis	Hylebos 943618 1/4/95 2 300 212 4 Englist	Hylebos 943628 1/5/95 2 360 481 6 Englist	Hylebos 943629 1/5/95 2 340 381 11 Englis	Hylebos 943630 1/5/95 2 329 304 6 Englis	Hylebos 943631 1/5/95 2 297 220 5 Englis	Hylebos 943632 1/5/95 2 338 252 10 English	Hytebos 943633 1/5/95 2 290 243 6 English	Hytebos 943634 1/5/95 2 285 206 5 English	Hylebos 943635 1/5/95 2 415 625 12 English	Hylebos 943636 1/5/95 2 360 438 12 English	Hytebos 943637 1/5/95 2 365 382 7 English	Hylebos 943639 1/5/95 2 345 359 7 English	Hylebos 943644 1/5/95 2 330 271 11 English	Hylebos 943645 1/5/95 2 320 306 3 English	Hvlebos 943647 1/5/95 2 275 205 2 English	Hylebos 943648 1/5/95 2 260 142 3 English	Hylebos 943649 1/5/95 2 250 115 English	Colvos 943650 1/6/95 2 332 325 6 English	Cohine 943651 1/6/95 2 320 235 6 English

Table 2.	n Histopathology Data for Reproductive Injury Study
	Ovarian Histo _l

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Reader	Site	Specimen #	Date collected	Xe Se	-ength_mn	Welght g	Age	Species	OVSTAGE	YATR	YATRsev	NVATR	NVATReev	1 ATR	LATReev	OVINEI	OVINEI CAV
Stehr	Colvos	943652	1/6/95	8	226	335	~	English	-	0	0	0	0	0	0	0	0
Myers	Colvos	943653	1/6/95	2	343	329	80	English	-	-	2	0	0	0	0	0	0
Olson	Colvos	943654	1/6/95	2	285	193	S	English	-	-	-	0	0	0	0	0	0
Olson	Colvos	943655	1/6/95	2	358	385	7	English	+		2	-	8	-	-	0	0
Myers	Colvos	943656	1/6/95	8	325	299	2	English	+	-	1	•	0	0	0	0	0
Myers	Colvos	943657	1/6/95	5	310	252	7	English	8	0	0	1	4	0	0	0	0
Stehr	Colvos	943658	1/6/95	8	328	322	S	English	-	0	0	0	0	0	0	0	0
Olson	Colvos	943659	1/6/95	~	340	368	8	English	-	-	9	-	1	-	2	0	0
Myers	Colvos	943660	1/6/95	8	305	274	8	English	•	-	e	0	0	0	0	•	0
Olson	Colvos	943661	1/6/95	8	328	283	~	English	5	-	8	0	0	•	0	-	4
Myers	Colvos	943662	1/6/95	2	345	388	2	English	-	-	2	0	0	0	•	0	0
Myers	Colvos	943663	1/6/95	2	308	243	8	English	+	0	0	0	0	0	•	0	0
Stehr	Colvos	943664	1/6/95	~	285	189	-	English	9	0	0	0	0	-	8	0	0
Myers	Colvos	943666	1/6/95	~	297	208	S	English	2	0	0	-	e	0	0	0	0
Stehr	Colvos	943667	1/6/95	~	298	232	+	English	+	0	0	-	e	0	0	0	0
Olson	Colvos	943669	1/6/95	~	295	229	2	English	4	-	-	-	-	0	•	-	-
Myers	Colvos	943670	1/6/95	2	280	220	4	English	4	1	2	0	0	0	0	0	0
Myers	Colvos	943671	1/6/95	2	280	168	4	English	2	0	0		-	•	0	0	0
Olson	Colvos	943672	1/6/95	2	299	213	+	English	2	0	•	-	8	0	0	-	~
Myers	Colvos	943681	1/9/95	2	295	238	S	English	4	1	9	0	0	0	0	0	0
Stehr	Colvos	943682	1/9/95	2	375	470	~	English	4	•	3	0	0	-	-	•	0
Stehr	Colvos	943683	1/9/95	2	350	360	~	English	4	-	-	0	0	-	-	0	0
Stehr	Colvos	943684	1/9/95	~	315	276	~	English	4	-	с,	0	0	0	0	0	0
Myers	Colvos	943685	1/9/95	à	310	220	-	English	8	0	0	-	1	0	0	0	0
Stehr	Colvos	943687	1/9/95	~	305	250	s	English	4	-	8	0	0	0	0	0	0
Olson	Colvos	943688	1/9/95	~	320	305	~	English	•	-	4	-	2	-	2	0	0
Myers	Colvos	943689	1/9/95	~	340	260	9	English	2	0	0	-	4	0	0	0	0
Myers	Colvos	943690	1/9/95	~	265	145		English	~	0	0	•	0	0	0	0	0
Myers	Hylebos	943716	2/7/95	~	291	192	0	English	8	0	0	•	0	-	2	0	0
Myers	Hytebos	943717	2/7/95	~	328	373	9	English	-	-	0	•	0	0	0	0	0
Stehr	Hylebos	943719	2/7/95	~	347	338		English	5	0	0	•	0	0	0	0	0
Myers	Hylebos	943720	2/7/95	~	346	354	=	English	5	•	0	-	S	-	4	0	0
Olson	Hylebos	943722	2/7/95	~	342	374	=	English	4	•	0	-	2	0	0	0	0
Stehr	Hylebos	943724	2/7/95	2	341	286	0	English	~	•	0	•	0	1	1	0	0
Stehr	Hylebos	943725	2/7/95	2	293	188	- 0	English	~	•	•	0	0	0	0	0	0
Myers	Hylebos	943726	2/7/95	~	344	345	2	English	~	•	•	•	0	0	0	0	0
	Hylebos	943732	2/7/95	~	305	262	-	English									
Olson	Hylebos	943737	2/8/95	~	330	287	0	English	~	•	•	-	4	0	0	-	2
Myers	Hylebos	943738	2/8/95	2	338	344	6	English	~	•	0	0	0	1	-	0	0
Olson	Hylebos	943739	2/8/95	2	337	335		English	-	-	~	-	-	-	-	-	5

	Injury Stud
	Reproductive
Table 2.	Data for
	Histopathology
	Ovarian

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Reader	Site	Specimen #	Date collected	Sex	ength mn	Weight g	Age	Species	OVSTAGE	YATR	YATReev	NYATR	NYATRsev	LATR	LATRsev	OVINFL	OVINFLeev
Olson	Hylebos	943740	2/8/95	8	300	278	5	English	8	0	0	0	0	0	0	-	e
Myers	Hylebos	943741	2/8/95	8	305	254	8	English	2	0	0	-	8	0	0	0	0
	Hylebos	943742	2/8/95	8	332	281	~	English									
Olson	Hylebos	943743	2/8/95	2	278	161	8	English	2	0	0	0	0	0	0	1	3
Myers	Hylebos	943744	2/8/95	2	318	304	8	English	+	-	9	0	0	0	0	0	0
Olson	Hylebos	943745	2/8/95	8	292	246	4	English	8	-	ß	0	0	0	0	0	0
Olson	Hylebos	943756	4/4/95	8	321	286	10	English		0	0	-	-	-	5	1	4
	Hylebos	943761	4/4/95	2	340	304	10	English									
Olson	Hylebos	943762	4/4/95	2	371	430	7	English	e	0	0	-	8	0	0	-	S
Stehr	Hylebos	943764	4/4/95	8	301	226	8	English	7	0	0	0	0	1	3	0	0
Stehr	Hylebos	943766	4/4/95	2	400	539	12	English	7	0	0	-	+	-	2	0	0
Myers	Hylebos	943768	4/4/95	8	382	370	7	English	2	0	0	0	0	0	0	0	0
Olson	Hylebos	943769	4/4/95	8	360	335	9	English	2	0	0	0	0	0	0	0	0
Olson	Hylebos	943771	4/4/95	2	319	281	7	English	2	0	0	1	1	0	0	-	4
Olson	Hylebos	943774	4/4/95	8	321	303	7	English	8	1	1	0	0	-	3	-	2
Myers	Hylebos	943775	4/4/95	8	289	210	5	English	2	0	0	0	0	0	0	0	0
Myers	Hylebos	943780	4/5/95	2	321	258	4	English	2	0	0	0	0	0	0	0	0
Olson	Hylebos	943783	4/5/95	8	357	390	10	English	2	1	-	0	0	1	-	1	7
Olson	Hylebos	943793	4/5/95	2	345	342	8	English	2	1	1	0	0	0	0	0	0
Stehr	Hylebos	943794	4/5/95	2	368	367	6	English	7	0	0	0	0	•	3	0	0
Myers	Hylebos	943795	4/5/95	2	329	299	80	English	7	0	0	0	0	0	0	0	0
Olson	Hytebos	943803	4/5/95	2	350	341	12	English	2		0	0	0	0	0	-	S
Olson	Hylebos	943805	4/5/95	8	300	325	8	English	89	0	0	-	1	0	0		e
	Hylebos	943806	4/5/95	2	319	248	2	English									
Stehr	Colvos	943829	4/6/95	8	345	320	16	English	~	0	0	0	0	-	9	0	0
Stehr	Colvos	943830	4/6/95	2	307	241	8	English	2	0	0	0	0	1	4	0	0
Stehr	Colvos	943831	4/6/95	8	344	331	2	English	~	0	0	0	0	-	2	0	0
Myers	Colvos	943832	4/6/95	2	280	169	0	English	2	-	8	0	0	0	0	0	0
Stehr	Colvos	943834	4/6/95	2	277	169	s	English	8	•	0	•	0	0	0	0	0
Olson	Colvos	943835	4/6/95	~	277	164	6	English	~	-	4	-	-	0	0	-	8
Myers	Colvos	943836	4/6/95	2	265	136	S	English	8	•	•	-	-	•	•	0	0
Stehr	Colvos	943838	4/6/95	~	341	294	13	English	~	•	0	-	8	-	4	0	0
Olson	Colvos	943839	4/6/95	~	362	378	9	English	~	-	8	•	0	•	0	-	3
Myers	Colvos	943840	4/6/95	2	292	195	+	English	~	-	-	•	0	0	0	0	0
Olson	Colvos	943841	4/6/95	8	335	311	8	English	~	-	~	0	0	0	•	0	0
Myers	Colvos	943842	4/6/95	~	290	190	9	English	~	•	•	•	0	0	0	0	0
	Colvos	943843	4/6/95	2	365	345	2	English									
Olson	Colvos	943844	4/6/95	2	307	212	S	English .	~	-	e 0	0	0	•	0	0	0
Olson	Colvos	943845	4/6/95	2	304	233	~	English	~	•	0	•	0	-	2	-	2
Olson	Colvos	943846	4/6/95	2	376	437	-	English	7		-	-	•	•	0	0	0

Table 2. Ovarian Histopathology Data for Reproductive Injury Study

Site Specimen # Date collected Sex Length mrtWeight d Age Species OVSTAGE YATR YA	Specimen # Date collected Sex Length mitWeight d Age Species OVSTAGE VATR VA	Date collected Sex Length mitWeight d Age Species OVSTAGE YATR YA	Sex Length mriWeight d Age Species OVSTAGE YATR YA	Length mriWeight d Age Species OVSTAGE YATR YA	Weight d Age Species OVSTAGE YATR YA	Age Species OVSTAGE YATR YA	Species OVSTAGE YATR YA	OVSTAGE YATR YA	YATR YA	YA	TReev	NYATR	NYATRaev	LATR	LATReev	OVINEL	OVINEI CAN
	Colvos	943847	4/6/95	8	284	181	0	Enoliish	~	0	0	0	0	•	0	0	o
Ś	vos	943848	4/6/95	2	291	197	4	English	2	0	0	0	0	0	0	0	0
ၓ	Nos	943855	4/6/95	8	250	117	3	English	2	0	0	-	e	0	0	0	0