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85%$1 /$.(6),6+(5,(6 678'<

)LVKHULHV $VVHVVPHQW E\
* %XUURZV DQG 5 3DLVKHJZRQ

9DOH /LYLQJ ZLWKDXDUHHQW &DQW8QLHYRQWDLULR 6XGEXU\
)RU IXUWKHU LQIRRPDWDEWRQUSOHHQXHOQQVLM0QXPRQ#OD

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85%$1 /$.(6),6+(5,(6 678'<

,1752'8&7,21

$OLFH /DNH   ƒ ¶ ´1   ƒ ¶ ´:   LW IXVW VR RXWKOLRH WRHFDHWG
VODJ SLOH QHDU WWKRO EDVPQGRWHHGZ&RKSOLFGR/DNHG LQ FRPSU
WKUHH PDLQ EDVLPQXP GHHSWKDVR PD[RV)WJKXHUHFRYHU SLFWXU
LOOXVWUDWHV LW GUDLQV LQWR PDKUH RDKSQODSLFWDDOH 5KDYHDF
SURYLGHG LQ 7DEOH

/LPQRORJLFDO VWHXGGLRHQV $OODLYFHH RIFKHUSUDLUPIDUOO\DOHG E\ 8QL
RI 7RURQWR UHVLQDYVRFKELQG +DXWDFVK FORVHX$USURRLPLWW\ WR W
&RQLVWRQ VPHOWHOLIYH SJOHLOFK\HG/HDJUHDKEOO WXKWHU ¶TXDDOLQGV ¶V
et al   0LQLVXWUDORJH1VRDXUFHV DQGGRRGHVLQG\FOD1VJH WKD
/DNH KDV QHYHU EEHDHULQRVWRGHNHGU\2FRHV1DWXUDO 5HVRXU

,Q   DV SDUW RI WKH 8UEDQ /DUJHQ WWLDXOG\8¶QVLKRESSHUHDZWL
)UHVKZDWHU (FRROHRJ\$8OQEDELV /DXUHYHDORRWQKJHZLUWONHVVH YHUR\OXQG
6XGEXU\ 7KH ORDXVNH O\EKHGGHSQUHVXUILYHU\HG LQ   DQG

7DEO$HOLFH /DNH ORFDWLRQ DQG*et al*SK\VLFDO GHVFULSWLRQ .LUN

7RZQVKLS	1HHORQ
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015) 'LVWULFW	6XGEXU\
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(OHYDWLRQ P	
6KRUHOLQH 'HYHORSPHQW)DFWRU	
1XPEHU RI &RWWDJHV /RGJHV	
)RUHVW 7\SH	6HPL EDUUHQ
6KRUHOLQH 7\SH	%HGURFN UXEEOH DQG FOD\
/DNH 6XUIDFH $UHD KD	
0D[LPXP 'HSWK P	
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9ROXPH	
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$FFHVV	3ULYDWH URDG YLD /RSHV /WG IRUPHUO\ &RQLVWRQ VPHOWHU &RQLVWRQ

0(7+2'6

)LVKHULHV &RPPXQLW\ $VVHVVPHQW

7KH ILVK FRPPXQLW\ RI $OLFH /DNH ... GE RFKRUGLDQG WR WZ...
,QGH[1HWWLQJ (EHRUJRFRRO ...SUSUHDQ DQG7KQXFOHQWVWLQJ SURU...
ZDV GHYHORSHG LQ6FEHGHLQLXVDHGHDWHQHGQRKUW WKQVWDWDLFURRVQL2FH
6HO éLQJHU WR DVVHVDEXVWKGHDUHOFGDLWOLYSHLFRLPHDVDJORG ILV
SURYLGH ELRO RRRQLRQDOOWKH RSURPSDXWLODDWLQ LRQ (GV6\QXEDLWQXW 0RUJ

$ WRWDO RI PXOWL PHVK JLOO QHWV ZHHUH VHW LQ HSWOLFZH
IRU DSSUR[LPDWHOPO\RIIXUHFVODHVWHGHOODQEODGSRWLDRFQVRWRV P\VXOWLSO
VWUDWD QHWWVVLQQ P PHḺ QHWWV LQHWV LQ ±
)LJXUH VKRZ W6OKHOLRROFDOOQWHLRWLRQQVGRUWLDQQ $WOLHFMHXVODYIHH\

$OO ILVK FDSWXUHGWZRHVSHLFGLHHQVWDLOGRWOROLOFLDHGELQIRUHPDWL
IRUN DQG WRWDJKOWHQQJWWKHPPQWZWRPDVDXFKLFVRQWGLGWV ZHUH
DOO ODUJH ERGLHGWUVXSFHWFXULHV ZHPHHIHQORDRORHVFKMVNGL VSRHFLHV D
PXVFOH WLVVXHVFDWPHSOHUORDP VXSSRWRRKHD FKLQ\GVSHEFGHXDVODVFURRVV D
IRU FRQWDPLQDQW DQG VWDEOHULHVRWRSXIUHHGDOWWRLWDO $OOHO
EXON ZHLJKHG IRUNHVDPSOQHHWRI X$SSEOXWRSHUOLQVGSHYFLLGHVZDV FRO
FRQWDPLQDQW DQG VWDEOH LVRWRSH DQDO\VLV

%DVHOLQH 2UJDQLVPV

$WWHPSWV ZHUH PDGH WRₙ FROOVHODWOWWDPUSDOIHLVKRI FODPV
+HSWDJHQLLₑG POₐₐₗₗₒₙUₑVS DQG DTXDWRLF $OOLDFQHWV/DNH IRU
IRRG ZHE VWXGLHV

&ODPV DQG VQDGOEE\ ZHVKDWODU MHFWDHUQHLDQJDQHDSLVFKNRLQH WKH
E\ KDQG RU ZLWK D ZHLSHQWVWDUJ&WMVDWHHGHEWR\HLVWWHLQJUMH PHVK P
WUDSV EDLWHGRZRLQVR YFHDULQQOLHJKVFDEHVSOLDWJVJWRUDG PDU\HOODLVH ZH
E\ WXUQLQJ RYHU URFFNDVODDRQQG ZWRKRHGDKHRHLEHDRG $OOLFNHLQJ WKH
RUJDQLVPV RII WKH VXUIDFH E\KDEXQGORIUV ZLPVWO\HD RSDXLS WRR W
RI WKH VDPH VSHFLHGHE\ ZDLW XWDODOLQJ\HVWFRODUHQHQLDQJHDVKHRLQ$OSDOOLFH /D
SLFNHG E\ KDQG

:DWHU 4XDOLW\ $VVHVVPHQW

$ GLVVROYHG R[\JHQSQHUPDJWXXUDHQ Gƒ &WHSXURIGLOQH ZDKVHPHHDLQ EDV
$OLFH /DNH RQ -XOD <6, 0RGXHOOLQJJGLHVVROWWHHSRI[UDWXUH PH
5HDGLQJV ZHUH WDNHDHQVDWWKURRRJKWWKH ZDWHU FROXPQ

:DWHU VDPSOHV ZHUH FROOHFWHGRR Q O-XFH, /DNH   6DRPPOWKV
VHQW WR WKH 0LQLVWU\ RI (QYLURQPHHQPWLDVWQOG &OOLEPDOWHR&U
DQDO\]HG IRU S+   DFR QOGXFWWLYLRWQ\ GSRRLWWRWYDOHN DRUOJIDOQLWF FDU
DQG PDMRU LRQV
7KH VDPSOLQJ ORFDWLRQ IRU ZDWHU TXDOLW\ FDQ EH VHH

5(68/76 $1' ',6&866,21
)LVKHULHV &RPPXQLW\ $VVHVVPHQW
'XULQJ WKH 1RUGLF VXUYH\ FRQGXFWWRWHHGOIURRP -XQHWV ZHUH
FDWFKLQJ D WRWPDHOLJRKIW GLLMHKUHLQRW ILVK VSHFLHV

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7KH 1RUGLF ,QGHR ÒOHKDWDG LQ ṆR VSUEURHMWURRFXÔHGX UÖHW KRH RULJEXW
PL[RI JHDU JLOOOLQHQWRZ WWUUDDSSVQ HWDWK PVHG X'UEDLQ JODNHV VX
$OLFH /DNH D WRWZHDOOHRFDSW X&FNGHUV YGH \WKKDLWWHH DVXGFNHU ZDV
DEXQGDQW VSèHFLHV 3RXKOHLQPRUH UHFHQW 1RUGLFKWXUYH\V
PRUH ILVK LQ WRWWDOULKRROHYNZUDVSHHOFRDXHVH XHUKDSVGLIIHU
DFWXDO FKDQJHV KLQ GRERSRVLWLQLHRIOLHVNDXJKFWLHLQZ ZLWK I
FDWFK RI ILVK ZLEWHKLQHOOVOKRZPSHOEWFHDVE X&QRGRDSQHWDWSLYH)UH
(FRORJ\ 8QLW HV6SERLQGHVVHULOFWWOQYSHHFDLEHXQGDOOQWFKHHRFDWFK
7DEOH

6SHFLHV ULFKQHVV DQG WRWDO SURSRUWLRQDO YLQ
UDQWRWLSYHH)URORRZDWGWGLUW(F

6XUYH\ 7\SH	0XOWL *HDU 6XUYH\	1RUGLF	1RUGLF
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&HQWUDO 0XGPLQQRZ			
1RUWKHUQ 3LNH			
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$OWKRXJK \HOOWRZOSOH WFKH LPVRVW QVXKPVSHFDOH\ORBEVXHOGYDGVWLO
/DNH QRUWKHUQ SLNDNHMRUFEWXRGODWOKHLRYRE J LQ
LQ

$ORQJ ZLWK WKHROODGUSLUYHDGOD WRRD\VDSSHFFLWHKVWHWR KOYFHHE/HHQ G
FRPSOHWH ORVVHSURRI WSRHPFHLIRV WHSWHDWUUHHQGOWV WRKHWUKH KDV
GHFOLQH LQHUVSLHFLHVGHONY\$OOLVFHLHUDGWXVXQYHWKH 1RUGLF PH
³EHORZ DYHUDJH´GHKVDLOQWQRYOD GX'HYRI WHG ZDV RDOFXOWDKLV K
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7KH XUEDQ ODNHHWRUVKLQHJUSULHRVJPURRQ XLFQWGHXGGEXVWDVIFDRQQGVV\VWX
WKH &RRSHUDWLYH)\8QLVWZDLWVWHU V\FR\RO2UOWH(&&RPVKH1\8LW\ RI
*UHDWHU 6XGEXUU\H9DRYHHUDQWK(HOSHDQEURUUDHPDKJDVVWEKHHQ OHG
6HLQ 5RE .LUN *HRQXHFLOORUVJDOLFK(HQQ*HR*KQ'HXQ\SLHZDWK WKH
VXSSRUW E\ -DVRQ +\XQGHUHZH&R+DUVWODOPWDXQGHQGWRV]HQVLQRFOXGH
JUDGXDWH VWXGHQHWVOO\$OQGSSHDUW /XGOLGLERWWWK.DXLLPKOQ DQG
DVVLVWDQWV 'DOODWLV\URRPQZDWRHUUQTXO2OD/&&SWRURVRXHHG WKH
DVVLVWDQFH RI -RFHO\QH +HQHEHHUUVWKD%QLNOODOHOOZKHRU FDRQQGVU
LQFOXGLQJ WKH PLRR\SODRQYLGGRHZQ OHGFG\HOZDNHRV WKHVH VWX

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$SSHOEHUJ 0   6ZHGLVK VWDQKGZDDUGHRPHVLKRGZLWRKUPXWDOR
     JLOOQHWV)LVNHULYHUHNHW ,QIRUPDWLRQ

&RRSHUDWLYH)RUHVW8KQZLDWWHU (FRROHZ 1R5±,& 'DWDDEDFWURVRIW
     $FFHVV 'DWDEDQH8QLY/DXVULHVQWV 6DXGEXU\ 2QWDULR

+DYDV 0 :RRGLQH<X*QJX.W P3DF,VDDF +& +XWFK%QROROJZFDO
     UHFRYHU\ RI WZRIHUHG YPHLRVXDOO\FR\QLGDWLP L6XDGEXEIG\O2QWDHDUQ
     &DQDGD :DWHRLO$3RJOODXQWGLRRQ

+XWFKLQVRQ 7& +DYDU\ RI SUHY5LHRXSRODHHDYQLSDLUH&RQLVWRQ
     IROORZLQJ UHGVXFWPLHRQDVLOLGHPVLXVOOVSLRXQWDOOGV\RHO 3$RLOOXW

6HOLQJHU : /RZPDQ6' 0.DDXHPDWH 0 RI /DNKH76WXWX SRSXOD
1RUWKHDVWHUQ 2QW8DQULFEOLVKHG UHSRVWU\ 2QWDWLXRJ
5HVRXUFHV 7LPPLQV 2QWDULR

APPENDIX I

Morphological data for *Micropterus dolomieu* smallmouth bass

from Alice Lake, July ±

Ageing Structure

Species	Fish Length mm	Fork Length mm	Total Weight g	Sex			Maturity			None	Scales	Pectoral Spine	Dorsal Spine	A Otolith	B Operculum	D Cleithrum	Genetic	Flesh	Stomach
				Male	Female	Unknown	Immature	Mature	Unknown										
Northern Pike																				AD
Northern Pike																				AD
Northern Pike																				AD
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Northern Pike																				AD
Smallmouth Bass																				A d
D Cleithrum																				

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6WUXFWXUH 7UH VXH

6SHFLHV	)LVK	)RUN 7RWDO /HQJWK HQJWK	:HLJKW	6H[	0DWXULW\	1RQH	1RQH
		PP PP	J	0DOH	,PPDWXUH	6FDOHV	)OHVK
				)HPDOH	0DWXUH	3HFWRUDO	6WRPDFK
				8QNQRZQ 8QNQRZQ		'RUVDO 6SLQH	QDGV
						$ 2WROLWK KROH	)LVK
						% 2SHUFXOXP HQHWLF	
						' &OHLWKUXP	

6PDOOPRXWK %DVV $

6PDOOPRXWK %DVV

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