## 19.08.01

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	Authorized	Proposed	PF	ROPOSED FFY	2000 TRUSTEE	AGENCIES	TOTALS	
Budget Category:	FFY 1999	FFY 2000	ADEC	ADF&G	ADNR	USFS	DOI	NOAA
	1.000		\$0.0	\$118.0	\$0.0	\$0.0	\$988.0	\$657.2
Personnel	\$684.4	\$892.9			la de service de la composición de la c	nik thais d		
Travel	\$41.0	\$21.2		an a	a an	alar Alarah dari dari dari dari dari dari dari dari		
Contractua!	\$848.8	\$634.1		Santar (1997) Managaran Santar				
Commodities	\$158.1	\$4.5						
Equipment	\$33.8	\$32.1		LONG RANG	<b>GE FUNDING R</b>	EQUIREMEN	NTS	
Subtotal	\$1,766.1	\$1,483.4	Estimated	Estimated				
General Administration	\$161.8	\$178.4	FFY 2001	FFY 2002				
Project Total	\$1,927.9	\$1,763.2	\$1,378.5	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Full-time Equivalents (FTE)	16.1	19.2						
		D	ollar amounts	are shown in the	ousands of dolla	ars.		
Other Resources	\$250.0	\$250.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0

Comments: The primary objective of the 1994 Forage Fish Study was to test techniques and collect data in PWS to aid in designing sampling methods for subsequent years. In 1995 the Apex Predator Ecosystem Experiment (APEX) conducted simultaneous seabird and hydroacoustic surveys in conjunction with collections of seabird productivity and energetics data. The 1996 APEX project will include related monitoring and research of seabirds and their forage fish prey. Additional components of APEX will continue analysis of historic Gulf of Alaska trawl data, ecoeystem modeling, and investigating continued exposure of sand lance to Exxon Valdez oil. The FY97 APEX study incorporates marbled murrelet (163R) investigations. The FY98 APEX study incorporates jellyfish (163S) investigations. The FY98 APEX study incorporates aerial surveys (163T) investigations. The last field year for APEX if FY99. FY00 and FY 01 are dedicated to sample and data analysis, and write up of final report and manuscripts for publication.

163D, Puffins as Samplers, was closed out in FY96. 97163H PI withdrew from the project, and 163C and 163N were closed out in FY98. The funds are slated to be redirected within the project.

2000

Project Number: 00163A-P Project Title: APEX Lead Agency:

Page 1

APR - 8 1999

EXXON VALDEZ OIL SPILI TRUSTEE COUNCIL

FORM 2A

PROJECT

DETAIL

FY0 -T budget

· · · · · · · · · · · · · · · · · · ·	Authorized	Proposed						
Budget Category:	FFY 1999	FFY 2000					an da ser da	
				e e e e e e e e e e e e e e e e e e e				
Personnel	\$84.6	\$131.0	e e e e		d an	1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 -	(1,1,2,2,2,2,2,2,2,2,2,2,2,2,2,2,2,2,2,2	
Travel	\$14.9	\$4.9			S. San Star			
Contractual	\$136.3	\$14.0						and a start
Commodities	\$5.4	\$0.0						
Equipment	\$9.0	\$0.0		LONG RAN	IGE FUNDIN	G REQUIREN	MENTS .	
Subtotal	\$250.2	\$149.9	Estimated	Estimated			Γ	
General Administration	\$22.2	\$20.6	FFY 2001	FFY 2002				
Project Total	\$272.4	\$170.5	\$170.5	\$0.0				
Full-time Equivalents (FTE)	1.3	2.0						
		[	Dollar amounts	are shown in	thousands of	dollars.		
Other Resources								

Comments: This project was first funded as a component of the Forage Fish Ecosystem Study (94163) then as the APEX project (95163A, 96163A, 97163A, 98163A, then 99163A). The University of Alaska withdrew from this project in FY99, but a small hydroacoustics contract is still likely. The contract budget details are still pending university approval. NMFS will complete the work for this project in FY99, FY00, anf FY01.

2000

Project Number: 00163A Project Title: APEX/Forage Fish Assessment Agency: NOAA

FORM 3A AGENCY PROJECT DETAIL

Pers	sonnel Costs:		GS/Range/	/ Months	Monthly		Proposed
	Name	Position Description	Step	Budgeted	Costs	Overtime	FFY 2000
	J. Thedinga	co-Pl	GS12	12.0	6,917		83.0
	L. Hulbert	co-PI	GS9	12.0	4,000		48.0
							0.0
							0.0
							0.0
							0.0
							0.0
							0.0
							0.0
	-		· .				0.0
						-	0.0
			-				0.0
		Subtotal		24.0	10,917	. 0	
					Pe	rsonnel Total	\$131.0
Trav	vel Costs:	· · · · · · · · · · · · · · · · · · ·	Ticke	t Round	Total	Daily	Proposed
	Description		Price	Trips	Days	Per Diem	FFY 2000
ľ	Juneau to Anchorage (APE)	X planning meetings/Thedinga, Hulbert,Wr	· 444	3	· 8	225	3.1
	Juneau to Anchorage (Rest	oration Workshop) Thedinga and Hulbert	444	2	4	225	1.8
							0.0
			•				0.0
					<i>.</i>		0.0
		•					0.0
							0.0
							0.0
							0.0
				•			0.0
		•					0.0
	<u> </u>					Travel Tatal	0.0
L	<u>``</u>		and the second			Travel Total	\$4.9
<b></b>		· · · · · · · · · · · · · · · · · · ·				Г <u></u> -	
		Project Number: 001634				F0	JKW 3B
	2000	Project Title: ADEV/Ecrose Fich A	00000000			· Pe	ersonnel
. '			ssessment			8	Travel
l		Agency: NOAA					DETAIL
L						1	لے۔۔۔۔۔ ص

Contractual Co	osts:	Proposed
Description	F	FY 2000
printing of APE>	X annaul report, DPD, and detailed budgets (100 copies each)	12.0
publication char	rges	2.0
When a non-tru	stee organization is used, the form 4A is required. Contractual Total	\$14.0
Commodities C	Costs:	Proposed
Description	F	FY 2000
		<b>\$</b> 0.0
]	Project Number: 00163A	
2000	Con	tractual
2000	Project little: APEX/Forage Fish Assessment	&
	Agency: NOAA	moditie
L		- <u></u>
		_ F

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New Equipment Purchases:		Number	Unit	Proposed
Description	- · · · · · · · · · · · · · · · · · · ·	of Units	Price	FFY 2000
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
	· .			0.0
				0.0
				. 0.0
				0.0
				0.0
				0.0
			liner ont Total	0.0
I hose purchases associated with replacement equi	pment should be indicated by placement of an R.		lipment i otai	\$0.0
Existing Equipment Usage:		·	Number	Inventory
		· · · · · · · · · · · · · · · · · · ·	of Units	Agency
· · ·				
				<del></del>
Decise t Number	- 004004		F	ORM 3B
		1	Fo	uinment
2000 Project Litle: A	PEX/Forage Fish Assessment			
Agency: NOA		· ·		
	· · · · · · · · · · · · · · · · · · ·		· •	

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	Authorized	Proposed				Carlor Maria		
Budget Category	FEV 1000	FEV 2000	a special date	e ferhardet		$\mathcal{L} = \mathcal{L} + \mathcal{L}$		16 16 26 186
	1111333	1112000				er, selener		No. And Anna Anna Anna Anna Anna Anna Anna
· ·						al de la companya de	Sec. Addition	4. 3. 4. L. C. S. F.
Personnel	\$104.0	\$111.6		Construction of the second	at designed by		a a sea a sea prime p	
Travel	\$1.0	\$2.0			$\{1,1,2,\dots,n\}$			
Contractual	\$0.0	\$10.4						
Commodities	\$0.3	\$0.0						
Equipment	\$0.0	\$10.6		LONG RAN	NGE FUNDING	<b>3 REQUIREM</b>	MENTS	
Subtotal	\$105.3	\$134.6	Estimated	Estimated				
General Administration	\$15.6	\$17.5	FFY 2001	FFY 2002				
Project Total	\$120.9	\$152.1	\$162.0	\$0.0	· ·			
Full-time Equivalents (FTE)	2.0	2.0						
		· . [	Dollar amounts	are shown in	thousands of o	dollars.		
Other Resources								
Comments: Write up seabird a	ctivity data while	simultaneou	sly monitoring	fish abundanc	e to determine	seabirds' rel	ationship to for	age
resources, how seabird's forac	ing behavior res	sponds to cha	nge in the fora	de resource, a	und if forage av	/ailability is lir	niting nonulatio	ົກ
recovery By collecting long to	m data an saab	ird activity wh	ilo cimultanooi	se receditoring	r forago fish ak	undence en	distribution th	is project
recovery. By collecting long ter	in uala un seau				lorage lish at			
will determine relationship to fo	brage resources	, how seabird	s' foraging ber	navior respond	is to change in	i the forage re	esource, and if	torage

availability is limiting population recovery.

2000	Project Number: 00163B Project Title: APEX/Seabird Interactions Agency: DOI	FORM 3A AGENCY PROJECT DETAIL	
		F	Sage 6

Per	sonnel Costs:		GS/Range/	Months	Monthly		Proposed
	Name	Position Description	Step	Budgeted	Costs	Overtime	FFY 2000
	B. Ostrand	PI	GS11-4	12.0	5,800		69.6
₿.	T. Gotthardt	Research Assistant	GS7-1	12.0	3,502		42.0
					· · ·		0.0
							0.0
							0.0
H							0.0
N.							0.0
							0.0
							0.0
						-	0.0
							0.0
							0.0
		Subtotal		24.0	9,302	0	
					Pei	rsonnel Total	\$111.6
Tra	vel Costs:		Ticket	Round	Total	Daily	Proposed
<b>  </b>	Description	·	Price	Trips	Days	Per Diem	FFY 2000
	travel to Pacific Seabird Gro	oup scientific meeting					0.0
	(USFWS will cover the expe	ected costs above \$1,000 each)	1300	2	10	. 70	2.0
1	·	•					0.0
.							0.0
1							0.0
·.							0.0
			1				0.0
							0.0
							0.0
						•	0.0
				-			0.0
		··	<u> </u>	L		Travel Total	\$2.0
L		· · · · · · · · · · · · · · · · · · ·					Ψ2.0
<u> </u>							
		Project Number: 00163B					
	2000	Project Title: APEX/Seabird Intera	actions				
]						8	
[					. [	[	DETAIL
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age 7

<b>Contractual Cos</b>	S:		Proposed
Description			FFY 2000
publication page	harges \$1,000/pub. X 4 papers		4.0
computer, printer	and network repair and maintenance		0.5
film			0.5
telephone service	S .		0.4
analysis of botton	grab samples		5.0
<b>I</b>			
ł			
P I	· · ·		
Albert o non frust	as argonization is used the form (A is required)	Contractual Total	
Commodifier O	ee organization is used, the form 4A is required.		\$10.4   Decent
Description	515.	· · · · · · · · · · · · · · · · · · ·	I Proposed
Description		· · · · · · · · · · · · · · · · · · ·	FFY 2000
· .	·		
		• •	
		<u> </u>	
		Commodities Total	\$0.0
	Drojost Number: 00162D		JRM 3B
2000	Project Number: 001638	i Co	ntractual
2000	Project Title: APEX/Seabird Interactions		&
-	Agency: DOI	Col	mmoditie
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			<u> </u>

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New Equipment Purchases:	Number Unit	Proposed
Description	of Units Price	FFY 2000
hydroacoustics analysis software	1 8,000	8.0
computer upgrades (hardware and software)	2 1,000	2.0
jaz computer disks	6 100	0.6
		0.0
		0.0
		0.0
		0,0
		0.0
1 · · ·	·	0.0
		0.0
		0.0
		0.0
		0.0
The se purchases associated with replacement equipm	nent should be indicated by placement of an R. New Equipment i otal	\$10.6
Existing Equipment Usage:		Inventory
		Agency
Project Number:	00163B	
<b>ZUUU</b>   Project Title: API	EX/Seabird Interactions	
Agency: DOI		)E I AIL

Pudgot Cotogony	Authorized	Proposed						
Budget Category.	FF1 1999	FF 1 2000		an a				
Poreonnol	¢110.0	£140 0						
	\$110.0	φ140.Z	E.					
Travel	\$7.1	\$2.0			a an			
Contractual	\$58.2	\$17.0		e en la sere				
Commodities	\$32.0	\$0.0						
Equipment	\$9.7	\$8.0		LONG RAN	IGE FUNDIN	IG REQUIR	EMENTS	
Subtotal	\$225.0	\$175.2	Estimated	Estimated	•			
General Administration	\$21.8	\$23.4	FFY 2001	FFY 2002				
Project Total	\$246.8	\$198.6	\$168.0	\$0.0				
÷		· · ·						
Full-time Equivalents (FTE)	2.6	3.5						
		1	Dollar amounts	are shown in	housands of	dollars.	·	
Other Resources			•					

of this project is being shared by the EVOS Trustee Council and the US Fish and Wildlife Service (FWS). The FWS is providing funding for most of the data collection at the Shoup Bay colony. This includes salaries for the camp leader, and two biotechnicians, travel cost and cost associated with running the field camp. The FWS is also providing funding for population size and productivity surveys of all 26 PWS kittiwake colonies. The APEX budget will provide funding for one Shoup Bay biotech.



Project Number: 00163 E Project Title: APEX/Kittiwakes Agency: DOI



Personnel Costs:	Personnel Costs:			Monthly		Proposed
Name	Position Description	Step	Budgeted	Costs	Overtime	FFY 2000
R. Suryan	co-Pl	GS11/4	12.0	5,700		68.4
D. Irons	co-Pl	GS12/6	0.5	7,200		3.6
	biotech.	GS7/1	12.0	2,900		34.8
	graduate student	,	6.0	2,300		13.8
	biotech. (kittiwake foraging)	GS5	12.0	2,300		27.6
					•	
					<u>.</u>	· ·
				· · · ·		
	S	ubtotal	42.5	20,400	0	
	· · · · · · · · · · · · · · · · · · ·			Pei	rsonnel Total	\$148.2
Travel Costs:		Ticket	Round	Total	Daily	Proposed
Description		Price	Trips	Days	Per Diem	FFY 2000
travel to Pacific Sea	bird Group meeting	650	1	5	70	1.0
travel to Ecological	Society meeting	650	1	. 5	70	1.0
						0.0
					-	0.0
						0.0
						0.0
						0.0
	•			,		0.0
	· ·				· .	0.0
· .		· ·	•			0.0
						0.0
	· · · · · · · · · · · · · · · · · · ·		l			0.0
·					I ravel I otal	\$2.0
					r	
					F	ORM 3B
2000	Project Number: 00163E				P	ersonnel
2000	Project Title: APEX/Kittiwake	S				Travel
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Contractual Costs:				Propose
Description				FFY 200
telephone services in office				0.
computer, printer, and netw	ork repair and maintenance			. 0.
film processing, postage, a	nd freight			0.
publication page charges \$	1,000/pub. X 11			11.
analysis of kittiwake diets (	300 x \$15)	· .		4.
		·		
· · · ·			• •	
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When a non-trustee organizatio	n is used, the form 4A is required.	، محمد المحمد ا	Cont	ractual Total \$17.
Commodities Costs:		·	·····	Propos
Description				FFY 20
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			Commo	
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	Project Number: 00163E			FORM 3B
2000	Project Title: APEX/Kittiwekee	8		Contractual 8
2000		3		Commodities
	Agency: DOI			DETAIL
L]	• • • • •	·		

New Equipment Purchases:	Number	Unit	Proposed
Description	. of Units	Price	FFY 2000
computer	2	3,000	6.0
computer software	2	1,000	2.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			. 0.0
		1	0.0
i nose purchases associated with replacement equipment should be indicated by placement of an R.		ipment I otal	\$8.0
Existing Equipment Usage:		Number	Inventory
	······	of Units	Agency
	-		
		r <del>e Lang</del> aran (	
		F	DRM 3R
Project Number: 00163E			uinment
2000 Project Title: APEX/Kittiwakes	Í		
Agency: DOI		L	
		L	

	Authorized	Proposed						
Budget Category:	FFY 1999	FFY 2000	a succession of the			hare to special		
Personnel	\$103.8	\$105.6	in Subsection of		25 (1996) (1996) 1997 - 1997 (1996)	1		Second second
Travel	\$6.3	\$2.0						
Contractual	\$22.0	\$19.7						
Commodities	\$25.2	. \$0.0			<b>.</b>			
Equipment	\$14.1	\$8.5		LONG RAN	IGE FUNDING	<b>G REQUIREM</b>	ENTS	
Subtotal	\$171.4	\$135.8	Estimated	Estimated				
General Administration	\$17.1	\$17.2	FFY 2001	FFY 2002				
Project Total	\$188.5	\$153.0	\$69.5	\$0.0		·		
· · · · ·								
Full-time Equivalents (FTE)	2.4	2.0	en en service en media.					
		]	Dollar amounts	are shown in	thousands of	dollars.		
Other Resources								

Comments: This study will write up the data on feeding and breeding ecology of pigeon guillemots on Naked Island in Prince William Sound and census their population there and at other designated study areas.

2000 Project Number: 00163F Project Title: APEX/Guillemots Agency: DOI Page 14

Personnel C	Costs:		GS/Range/	Months	Monthly		Proposed
Name		Position Description	Step	Budgeted	Costs	Overtime	FFY 2000
G. Gole	t	PI	GS 11/2	12.0	5,300	· · · ·	63.6
		bio. tech. (term)	GS 7	12.0	3,500		42.0
		· · · · · · · · · · · · · · · · · · ·					
			·				
:		Subtotal		24.0	8,800	0	
1					Pe	rsonnel Total	\$105.6
Travel Cost	S:		Ticket	Round	Total	Daily	Proposed
Descrip	tion	· · · · · · · · · · · · · · · · · · ·	Price	Trips	Days	Per Diem	FFY 2000
travel to	Pacific Seabird Gro	oup meeting	650	· 1	.5	70	1.0
travel to	Ecological Society	meeting	650	1	5	70	1.0
		· · · ·					0.0
							0.0
							0.0
							0.0
	•						0.0
		· · ·					0.0
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		· .					0.0
				·		They all Tatel	0.0
			<u></u>				\$2.0
r	· · ·				·	[	
		Project Number: 001635				F	JRM 3B
2000	ר				· .	Pe	ersonnel
		•			8	Travel	
		Agency: DOI				r	DETAIL
L	J			•		L	

Description     FFY 2000       telephone service in office computer, printer, network repair and maintenance film processing, postage, and freight publication page charges \$1,000/pub. X 8     0.4       blood analysis and write up     0.3       When a non-trustee organization is used, the form 4A is required.     Contractual Total       \$19.7     Proposed       Description     900       When a non-trustee organization is used, the form 4A is required.     Contractual Total       \$19.7     Commodities Costs:       Description     900       Description     0.0       0.0     0.0 </th <th>Contractual Costs:</th> <th></th> <th>Proposed</th>	Contractual Costs:		Proposed
telephone service in office     0.4       computer, printer, network repair and maintenance     1.0       film processing, postage, and freight     0.3       publication page charges \$1,000/pub. X 8     8.0       blood analysis and write up     10.0       When a non-trustee organization is used, the form 4A is required.     Contractual Total       S19.7     Proposed       Commodities Costs:     Proposed       Description     6.0       0.0     0.0    <	Description		FFY 2000
computer, printer, network repair and maintenance     1.0       film processing, postage, and freight     0.3       publication page charges \$1,000/pub. X 8     8.0       blood analysis and write up     10.0       When a non-trustee organization is used, the form 4A is required.     Contractual Total       S19.7     S19.7       Commodities Costs:     Proposed       Description     6.0       0.0     0.0       0.0 <t< td=""><td>telephone service in office</td><td></td><td>0.4</td></t<>	telephone service in office		0.4
dim processing, postage, and freight publication page charges \$1,000/pub. X 8     0.3       blood analysis and write up     8.0       When a non-trustee organization is used, the form 4A is required.     Contractual Total       \$19.7     Proposed       Commodities Costs:     Proposed       Description     0.0       0.0 <td>computer, printer, network repair and maintenance</td> <td></td> <td>1.0</td>	computer, printer, network repair and maintenance		1.0
publication page charges \$1,000/pub. X 8     8.0       blood analysis and write up     10.0       When a non-trustee organization is used, the form 4A is required.     Contractual Total       Signature     Proposed       Description     FFY 2000       Project Number: 00163F     \$0.0       Project Number: 00163F     Project Title: APEX/Guillemots       Agency: DOI     FORM 3B       Commodities DetAil     Commodities DetAil	film processing, postage, and freight		0.3
blood analysis and write up 10.0 When a non-trustee organization is used, the form 4A is required. Contractual Total \$19.7 Commodities Costs: Proposed Description FFY 2000 FF	publication page charges \$1,000/pub. X 8		8.0
When a non-trustee organization is used, the form 4A is required.       Contractual Total       \$19.7         Commodities Costs:       Proposed       Proposed         Description       6.0       0.0         0.0       0.0       0.0         0.0<	blood analysis and write up		10.0
When a non-trustee organization is used, the form 4A is required.       Contractual Total       \$19.7         Commodities Costs:       Proposed         Description       6.0         0.0       0.0         0.0			
When a non-trustee organization is used, the form 4A is required.       Contractual Total       \$19.7         Commodities Costs:       Proposed         Description       FFY 2000         0.0       0.0         0.0<		· .	
When a non-trustee organization is used, the form 4A is required.       Contractual Total       \$19.7         Commodities Costs:       Proposed       Proposed         Description       6.0       0.0         0.0       0.0       0.0         0.0<			
When a non-trustee organization is used, the form 4A is required.       Contractual Total       \$19.7         Commodities Costs:       Proposed         Description       FFY 2000         0.0       0.0         0.0<		<b>`</b> .	
When a non-trustee organization is used, the form 4A is required.       Contractual Total       \$19.7         Commodities Costs:       Proposed         Description       FFY 2000         0.0       0.0         0.0<			
When a non-trustee organization is used, the form 4A is required.       Contractual Total       \$19.7         Commodities Costs:       Proposed         Description       0.0         0.0		•	
When a non-trustee organization is used, the form 4A is required.       Contractual Total       \$19.7         Commodities Costs:       Proposed         Description       FFY 2000         0.0       0.0         0.0<			
When a non-trustee organization is used, the form 4A is required.       Contractual Total       \$19.7         Commodities Costs:       Proposed         Description       FFY 2000         0.0       0.0         0.0<		-*	
Commodities Costs:       Proposed         Description       FFY 2000         0.0       0.0 <t< td=""><td>When a non-trustee organization is used, the form 4A is required.</td><td>Contractual Total</td><td>\$19.7</td></t<>	When a non-trustee organization is used, the form 4A is required.	Contractual Total	\$19.7
Description       FFY 2000         0.0       0.0         0.0 <td>Commodities Costs:</td> <td></td> <td>Proposed</td>	Commodities Costs:		Proposed
2000 Project Number: 00163F Project Title: APEX/Guillemots Agency: DOI	Description		FFY 2000
2000 Project Number: 00163F Project Title: APEX/Guillemots Agency: DOI			0.0
2000 Project Number: 00163F Project Title: APEX/Guillemots Agency: DOI			0.0
2000 Project Number: 00163F Project Title: APEX/Guillemots Agency: DOI			0.0
2000 Project Number: 00163F Project Title: APEX/Guillemots Agency: DOI	· ·		0.0
2000 Project Number: 00163F Project Title: APEX/Guillemots Agency: DOI			0.0
2000 Project Number: 00163F Project Title: APEX/Guillemots Agency: DOI			0.0
2000 Project Number: 00163F Project Title: APEX/Guillemots Agency: DOI			0.0
0.0 Commodities Total \$0.0 Project Number: 00163F Project Title: APEX/Guillemots Agency: DOI			0.0
2000 Project Number: 00163F Project Title: APEX/Guillemots Agency: DOI			0.0
2000 Project Number: 00163F Project Title: APEX/Guillemots Agency: DOI			
2000 Project Number: 00163F Project Title: APEX/Guillemots Agency: DOI			
2000 Project Number: 00163F Project Title: APEX/Guillemots Agency: DOI			
2000 Project Number: 00163F Project Title: APEX/Guillemots Agency: DOI DETAIL	l	Commodities Total	\$0.0
2000Project Number: 00163F Project Title: APEX/Guillemots Agency: DOIFORM 3B Contractual & Commodities DETAIL			
2000 Project Number: 00163F Project Title: APEX/Guillemots Agency: DOI DETAIL	Drainet Number: 00102E		RM 3B 🛛 🛛
ZUUU     Project Title: APEX/Guillemots     Commodities       Agency: DOI     DETAIL	2000	Contr	actual &
Agency: DOI DETAIL	Project Title: APEX/Guillemots		nodities
	Agency: DOI		TAII
			/

Nev	v Equipment	Purchases:						Number	Unit	Proposed
Des	cription					· · · · · · · · · · · · · · · · · · ·	·	of Units	Price	FFY 2000
	computer						· .	1	3,000	3.0
1	computer so	ftware						1	2,500	2.5
ł	upgrades for	2 existing com	puters					3	1,000	3.0
	ł									0.0
					<i>x</i>			· .		0.0
1					4					0.0
					·				-	0.0
										0.0
										0.0
ļ										0.0
1										0.0
										0.0
					• • • • • • • • • • • • • • • • • • •					0.0
	se purchases	s associated wit	n replacement	equipment s	snould be indica	ited by place	ment of an R.		lipment lotal	\$8.5
EXI	sting Equipm	ent Usage:	<u> </u>		· · · · ·	· ·			Number	Inventory
Des	scription					<u> </u>			of Units	Agency
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<b></b>		] .	1							
			Project Nun	nber: 0016	63F	•			F0	ORM 3B
2000 Project Title: APEX/Guillemots								Eq	uipment	
1 '			Agency: DC							DETAIL
L				71					ć L	
		•								De

Budget Category:	Authorized FFY 1999	Proposed FFY 2000	14 					
Personnel	\$0.0	\$0.0					1	and the Annual
Travel	\$0.0	\$0.0						Sec. Sec. Sec.
Contractual	\$167.4	\$96.0			the start of the s			
Commodities	\$0.0	\$0.0						
Equipment	\$0.0	\$0.0		LONG RAN	IGE FUNDING	<b>G REQUIREN</b>	<b>MENTS</b>	
Subtotal	\$167.4	\$96.0	Estimated	Estimated				
General Administration	\$11.7	\$6.7	FFY 2001	FFY 2002				
Project Total	\$179.1	\$102.7	\$91.7	\$0.0				
		·			The second			
Full-time Equivalents (FTE)	0.0	0.0					er filst start file i	
		· [	Dollar amounts	are shown in	thousands of o	dollars.		
Other Resources								

2000 Project Number: 00163G Project Title: APEX/Seabird Energetics Agency: NOAA FORM 3A AGENCY PROJECT DETAIL

Per	sonnel Costs:		GS/Range/	Months	Monthly		Proposed
	Name	Position Description	Step	Budgeted	Costs	Overtime	FFY 2000
							0.0
							0.0
							0.0
							0.0
							0.0
							0.0
			-				0.0
							0.0
							0.0
							0.0
							0.0
<u> </u>	<u> </u>						0.0
	· · · · · · · · · · · · · · · · ·	Subtotal		0.0	0	0	<u> </u>
<u> </u>		<u> </u>	<del></del>	· · · · · · · · · · · · · · · · · · ·	Pe	rsonnei lotai	\$0.0
Trav		<u></u>	l icket	Round	lotal	Daily	Proposed
<u> </u>	Description	· · · · · · · · · · · · · · · · · · ·	Price	Irips	Days	Per Diem	FFY 2000
							0.0
							0.0
		· ·					
		,					0.0
							0.0
1							0.0
	· ·		*				0.0
							0.0
						•	0.0
							0.0
							0.0
		······································			· · · ·	Travel Total	\$0.0
			·····	- · · · · ·	······		
		· · ·				F	ORM 3B
		Project Number: 00163G					areonnal
	2000	Project Title: APEX/Seabird Energy	retics				
		Agency: NOAA				č	
						ļ	DETAIL
						·	

Contractual Costs:	Proposed
Description	FFY 2000
Contract with Oregon University Cooperative Research Unit.	96.0
When a non-trustee organization is used, the form 4A is required.	tual Total \$96.0
Commodities Costs:	Proposed
Description	FFY 2000
Commodit	ties Total \$0.0
2000 Project Number: 00163G Project Title: APEX/Seabird Energetics Agency: NOAA	FORM 3B Contractual & Commodities DETAIL

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New Equipment Purchases:	Number	Unit	Proposed
Description	of Units	Price	FFY 2000
			0.0
			0.0
			0.0
			0.0
			0.0
· · · · ·			0.0
	-		0.0
			0.0
			0.0
			0.0
			0.0
			0.0
Those purchases associated with replacement equipment should be indicated by placement of an R.	New Equ	ipment Total	\$0.0
Existing Equipment Usage:		Number	Inventory
Description	······································	of Units	Agency
· · · · · · · · · · · · · · · · · · ·			
			-
	×		
	•		
	•		`
Project Number: 001620		· F	
2000		F	uinment
Project Litle: APEX/Seabird Energetics			
Agency: NOAA		.   L	
		L	

<sup>;</sup>Y00163A-T budget

		Authorized	Proposed					e state de la composition de la composi	
Budget Category:		FFY 1999	FFY 2000		a sa santa s				
Personnel		\$77.2	\$46.0		Sector Cont				
Travel		\$7.5	\$8.7						
Contractual		\$18.9	\$11.0						
Commodities		\$21.2	\$2.1	Sector Sector					
Equipment		\$0.0	\$0.0		LONG RA	NGE FUNDIN	IG REQUIREN	MENTS	
Subtotal		\$124.8	\$67.8	Estimated	Estimated				
Indirect (26% or 42.5%	)	\$42.6	\$28.2	FFY 2001	FFY 2002				
Project Total		\$167.4	\$96.0	\$85.7	\$0.0				
Full-time Equivalents (	FTE)	2.8	1.3						Same States
			[	Dollar amounts	are shown in	thousands of	dollars.	_	
Other Resources									
		,					· ·	· ·	
							<u></u>	<del>~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~</del>	
2000		Project Nur Project Title Name: Ore	mber: 0016 e: APEX/Se gon State L	3G eabird Energ Jniversity	etics	• .			FORM 4A Non- Trustee DETAIL

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Page 22

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Budgeted 12.0 3.0	Costs 3,557 1,100	Overtime	FFY 2000 42.7 3.3 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
12.0 3.0 15.0	3,557 1,100		42.7 3.3 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
3.0	1,100		3.3 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
15.0			0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
15.0			0.0 0.0 0.0 0.0 0.0 0.0 0.0
15.0			0.0 0.0 0.0 0.0 0.0 0.0
15.0			0.0 0.0 0.0 0.0 0.0 0.0
15.0			0.0 0.0 0.0 0.0 0.0
15.0			0.0 0.0 0.0 0.0
15.0			0.0 0.0 0.0
15.0			0.0 0.0
15.0			0.0
15.0			
15.0			0.0
A123	4,657	0	
	Pe	rsonnel Total	\$46.0
et Round	Total	Daily	Proposed
e Trips	Days	Per Diem	FFY 2000
2	12	130	3.6
2	12	130	3.0
4	10	130	2.1
			0.0
			0.0
			0.0
			0.0
	*		0.0
			0.0
			0.0
	· · ·	Travel Total	\$8.7
		P	ersonnel
· ·		8   8	Travel
		'   [	DETAIL
		L	De
	at     Round       ie     Trips       i0     2       i0     2       i0     4	Pe           Round         Total           Image: second s	Personnel Total at Round Total Daily e Trips Days Per Diem 0 2 12 130 0 2 12 130 0 4 10 130 Travel Total

Contractual Costs:				Proposed
Description				FFY 2000
lab. equipment maintenance				1.0
personal services contract t	o FALCO for fish ID and processing			4.5
duplication/computer fees			1	1.0
publication: page charges, r	eports, visual aids			1.5
telephone services (long dis	stance)	, ,		2.5
shipping of samples				0.5
		,		
	· · · · · ·			
	· · ·			
			•	
		• .	Contractual Total	\$11.0
Commodities Costs:		·		Proposed
Description	·			FFY 2000
chemicals		, , , , , , , , , , , , , , , , , , ,		0.6
thimbles, extraction	• •			0.5
lab supplies/analysis	· .			1.0
	· · ·			
				1
		•		
			Commodities Total	\$2.1
				······
	Basis of New Jack 201000		FOF	RM 4B
2000	Project Number: 00163G		Contr	actual &
2000	Project Title: APEX/Seabird Energetics		Comr	nodities
^	Name: Oregon State University			
·			·	Pa

ige 24

Nev	v Equipment Purchases:	Number	Unit	Proposed
Des	cription	of Units	Price	FFY 2000
				0.0
	· · ·		•	0.0
		•		0.0
				0.0
				0.0
				0.0
l I				0.0
				0.0
				0.0
				0.0
			-	0.0
				0.0
Tho	se purchases associated with replacement equipment should be indicated by placement of an R.	New Equ	ipment Total	\$0.0
Exis	sting Equipment Usage:	· ·	Number	
Des	scription		of Units	
ł		· .	-	
		-		
			•	
				Sector 1
1				
		· .		
		····	 [	
	Project Number: 00162G		F!	ORM 4B
	2000		Ed	uipment
				DETAIL
	Name: Oregon State University			

Budget Category:	Authorized FFY 1999	Proposed FFY 2000						
Personnel	\$0.0	\$0.0						
Travel	\$0.0	\$0.0						
Contractual	\$92.3	\$80.9						
Commodities	\$0.0	\$0.0						
Equipment	\$0.0	\$0.0		LONG RANGE FUNDING REQUIREMENTS				
Subtotal	\$92.3	\$80.9	Estimated	Estimated				
General Administration	\$6.5	\$5.7	FFY 2001	FFY 2002				
Project Total	\$98.8	\$86.6	\$55.6	\$0.0				
Full-time Equivalents (FTE)	1.7	1.7		Martin Frank				
		Dollar amounts are shown in thousands of dollars.						
Other Resources								· ·

Comments: This component of the APEX project will provide scientific oversight, coordination, performance tracking, and integration of results. The project management will have elements that have been used effectively in other large, multidisciplinary programs for ecosystem assessment. This is a proposal submitted under the Broad Agency Announcement.

2000

Project Number: 00163I Project Title: APEX/Project Management Agency: NOAA FORM 3A AGENCY PROJECT DETAIL

Per	sonnel Costs:		GS/Range/	Months	Monthly		Proposed
	Name	Position Description	Step	Budgeted	Costs	Overtime	FFY 2000
							0.0
							0.0
							0.0
		· ·					0.0
				· .			0.0
							0.0
	·						0.0
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							0.0
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	<u> </u>			· · · · · · · · · · · · · · · · · · ·			0.0
		Subtotal	the state of the second	0.0		U Toonnal Tatal	60.0
				<u> </u>		sonner Total	<u>\$0.0</u>
		· · · · · · · · · · · · · · · · · · ·		Round	Total	Dally Der Diem	Proposea
	Description	· · · · · · · · · · · · · · · · · · ·	Plice	inps	Days	Per Diem	FFT 2000
		•					0.0
					•		0.0
							0.0
Į		· · · · · ·					0.0
				-		<u>.</u>	0.0
							0.0
			• • • • •				0.0
							0.0
				· .	·		0.0
							0.0
							0.0
				· · · ·	· · · · ·	Travel Total	\$0.0
			1			F	ORM 3B
	0000				Pe	ersonnel	
	2000	ement			۲۱ و	Traval	
ļ	1	Agency: NOAA				0	
						L_L	
	· .						De

Contractual Cos	sts:					Proposed
Description					1	FFY 2000
contract to Unive	ersity of Alaska	Anchorage (BAA)	· · · · · · · · · · · · · · · · · · ·			80.9
ll la l	a di seconda					
1				•		
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Albert o hon true	too organizatio	n is used the form 1A is required	, 	Contractu		<u> </u>
When a non-uus	see organizatio	n is used, the form 4A is required.				
Commodities C	0515.	· · · · · · · · · · · · · · · · · · ·	·	<del> </del>		Froposed
Description	·	······································				FFT 2000
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<b>]</b>		•				
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					- <b>T</b> - 4 - 1	
L				Commoditie	s I Otal	\$0.0
· · · · · ·	٦	······································	· · · · · · · · · · · · · · · · · · ·			
	i	Project Number: 00163			FOR	M 3B
2000		Project Title: APEX/Project Managam	ont		Contra	ictual &
			ont		Comm	odities
		Agency: NOAA			DE	TAIL
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Description of Units Price FFY 2000  Output  O
Image: Control of the second secon
Image: Control of the second secon
Image: Secret processes     0.0       Image: Secret processes
Image: Control of the indicated by placement of an R.       New Equipment Total       \$0.0         Image: Control of the indicated by placement of an R.       New Equipment Total       \$0.0         Existing Equipment Usage: Control of the indicated by placement of an R.       Number       Inventory         Description       of Units       Agency
0.0       0.0         0.0       0
Image: Control of the second state
Image: Constraint of an R.       New Equipment Total       \$0.0         Image: Constraint of an R.       New Equipment Total       \$0.0         Existing Equipment Usage: Constraint of Units       Number       Inventory         Description       of Units       Agency
Image: Constraint of an R.       New Equipment Total       \$0.0         Image: Constraint of an R.       New Equipment Total       \$0.0         Existing Equipment Usage: Constraint of Units       Number       Inventory         Description       of Units       Agency
Image: Constraint of an R.       New Equipment Total       \$0.0         Existing Equipment Usage: Constraint of an R.       New Equipment Total       \$0.0         Description       of Units       Agency
Inose purchases associated with replacement equipment should be indicated by placement of an R.       New Equipment Total       \$0.0         Existing Equipment Usage:       Number       Inventory         Description       of Units       Agency
Inventory       0.0         Chose purchases associated with replacement equipment should be indicated by placement of an R.       New Equipment Total         Existing Equipment Usage:       Number         Description       of Units
Image: Constraint of an R.       New Equipment Total       \$0.0         Existing Equipment Usage: Constraint of an R.       New Equipment Total       \$0.0         Description       of Units       Agency
Image:       0.0         Image:       Image:         Existing Equipment Usage:       Number         Description       of Units
Inose purchases associated with replacement equipment should be indicated by placement of an R.     New Equipment rotal     \$0.0       Existing Equipment Usage:     Number     Inventory       Description     of Units     Agency
Existing Equipment Usage:         Number         Inventory           Description         of Units         Agency
FORM 3B
Project Number: 001631
<b>ZUUU</b> Project Title: APEX/Project Management
Agency: NOAA DETAIL

	Authorized	Proposed	Second Second					
Budget Category:	FFY 1999	FFY 2000						
Personnel	\$22.9	\$48.9						
Travel	\$11.0	\$4.6						
Contractual	\$45.0	\$20.0	A STATE AND AND A					
Commodities	\$5.0	\$0.0						
Equipment	\$0.0	\$0.0		LONG RA	NGE FUNDIN	IG REQUIRE	MENTS	
Subtotal	\$83.9	\$73.5	Estimated	Estimated		T	Ì	T
Indirect (10.0%)	\$8.4	\$7.4	FFY 2001	FFY 2002				
Project Total	\$92.3	\$80.9	\$52.0	\$0.0				
					a she are a single			
Full-time Equivalents (FTE)	· 0.2	0.5			0.4° ( 5.3.4°			
	<u>.</u>	. 1	Dollar amounts are shown in thousands of dollars.					
Other Resources								

Comments: This component of the APEX project will provide scientific oversight, coordination, performance tracking, and integration of results. The program management employed will have elements that have been used effectively in other large, multidisciplinary programs for ecosystem assessment. This is a proposal submitted under the Broad Agency Announcement.

2000	Project Number: 00163I Project Title: APEX/Project Management Name: Panumanok Solutions	FORM 4A Non- Trustee DETAIL
		Page 3

Pers	sonnel Costs:			Months	Monthly	<u> </u>	Proposed
	Name	Position Description		Budgeted	Costs	Overtime	FFY 2000
	D. Duffy	PI		6.0	8,158		48.9
			- Collection and the second				0.0
							0.0
							0.0
	·						0.0
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						<u>.</u>	0.0
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			and the second				0.0
	· · · · ·		2.246.25				0.0
		•					0.0
		l		· · · · · · · · · · · · · · · · · · ·			0.0
<b> </b>	Subtotal 6.0 8,158						0.10.0
<u></u>				·	Pe	rsonnei i otai	\$48.9
Irav	/el Costs:	······································		Round	lotal	Daily	Proposed
79563.0	Description			I rips	Days	Per Diem	FFY 2000
	conterence Pacific Seabird	Group meeting	800	1	4	200	1.8
	Anchorage to Juneau		600	· Z	. 1	225	2.0
							0.0
		· · · ·					0.0
							0.0
							0.0
							0.0
							0.0
							0.0
							0.0
		· · ·			•		0.0
						Travel Total	\$4.6
		· · · · · · · · · · · · · · · · · · ·				F	ORM 4B
Project Number: 00163						Pe	ersonnel
	2000	Project Title: APEX/Project Mana	gement			אַ	Travel
Name: Panumanok Solutions							
L	·					L	
							Day

Contractual Costs:	Proposed
Description	FFY 2000
capelin data synthesis contract	20.0
	•
	,
	•
Contractual Total	\$20.0
Commodities Costs:	Proposed
Description	FFY 2000
	· .
Commodities Total	\$0.0
Project Number: 001631	M 4B
Ontroiset Titles ADEV/Droiset Management	actual &
Name: Panumanok Solutions	
	IAIL

New Equipment Purchases:		Number	Unit	Proposed
Description		of Units	Price	FFY 2000
				0.0
				0.0
				0.0 0.0 0.0
	· · · · · · · · · · · · · · · · · · ·			0.0
Those purchases associated wit	h replacement equipment should be indicated by placement of an R.	New Equ	lipment lotal	\$0.0
Description			of Units	Į
computers			2	
				dan tanàn Ny INSEE dia N
		•		
· · ·				
2000	Project Number: 00163I Project Title: APEX/Project Management Name: Panumanok Solutions	-	F( Ec	ORM 4B quipment DETAIL

	Authorized	Proposed			a substeps	PAN BARAN				
Budget Category:	FFY 1999	FFY 2000								
Personnel	\$76.4	\$63.4								
Travel	\$2.5	\$1.9								
Contractual	\$12.2	\$5.4				والمتعادية والمتعادية				
Commodities	\$12.4	\$0.0						n an Galacter San tao Bartan		
Equipment	\$0.0	\$0.0	LONG RANGE FUNDING REQUIREMENTS							
Subtotal	\$103.5	\$70.7	Estimated	Estimated						
General Administration	\$12.2	\$9.9	FFY 2001	FFY 2002				1 1		
Project Total	\$115.7	\$80.6	\$80.0	\$0.0						
Full-time Equivalents (FTE)	1.8	1.4								
	Dollar amounts are shown in thousands of dollars.									
Other Resources		•								

Comments: This component is designed to collect data on common murres, kittiwakes, and puffins on the Barren Islands (which is in the EVOS area) that will be used in a multi-species analysis of seabird productivity and energetics.

2000

Project Number: 00163J Project Title: APEX/Barren Islands Seabird Studies Agency: DOI FORM 3A AGENCY PROJECT DETAIL

Per	Personnel Costs:			Months	Monthly		Proposed			
	Name	Position Description	Step	Budgeted	Costs	Overtime	FFY 2000			
	D. Roseneau	PI	GS11/5	6.8	5,100		34.7			
1	A. Kettle	bio. tech.	GS7/1	8.7	3,300		28.7			
1	V. Byrd	Program Manager	GS13	1.6	o		0.0			
							0.0			
1		• .		х.			0.0			
							0.0			
							0.0			
		· · ·					0.0			
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	- ·						0.0			
							0.0			
					(		0.0			
	· · ·	Subtota		17.1	8,400	0				
	Pers									
Tra	vel Costs:		Ticket	Round	Total	Daily	Proposed			
	Description	·	Price	Trips	Days	Per Diem	FFY 2000			
	Homer to Anchorage EVOS Workshop)			2	4	150	0.9			
	Pacific Seabird Group meeting			1	5	70	· 1.0			
				•			0.0			
	· ·						0.0			
1							0.0			
1							· 0.0			
							0.0			
		· ·					. 0.0			
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		· ·					0.0			
							0.0			
			· · · · · · · · · · · · · · · · · · ·			Travel Total	\$1.9			
		P			1					
						F	ORM 3B			
	0000	Project Number: 00163J				Pr	ersonnel			
	2000	Project Title: APEX/Barren Islands	s Seabird St	udies		2	Travel			
		Agency: DOI		•						
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s

Contractual Costs:	Proposed
Description	FFY 2000
page charges (\$1,000/paper x 5)	5.0
poster preparation	0.4
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When a non-trustee organization is used, the form 4A is required. Contractual Total	\$5.4
Commodities Costs:	Proposed
Description	FFY 2000
Commodities Total	\$0.0
FOI	RM 3B
Project Number: 00163J	notuol P
2000 Project Title: APEX/Barren Islands Seabird Studies	actual or
Agency: DOI	nodities
	TAIL

New Equipment	Purchases:		Number	Unit	Proposed
Description		· · · · · · · · · · · · · · · · · · ·	of Units	Price	FFY 2000
		· · · · · · · · · · · · · · · · ·			0.0
					. 0.0
		·			0.0
					0.0
				:	0.0
					0.0
					0.0
					0.0
					0.0
		·			0.0
					0.0
				• •	0.0
			L		0.0
Those purchases	s associated will	th replacement equipment should be indicated by placement of an R.	New Equ	lipment Total	\$0.0
Existing Equipm	ent Usage:	<u></u>		Number	Inventory
Description	<u> </u>		·	of Units	Agency
1	•				
				• .	
	•				
				•	
L			<u> </u>	·	
	]				
		Project Number: 00163J			
2000		Project Title: APEX/Barren Islands Seabird Studies		Eq	upment
		Agency: DOI			DETAIL
·	J			· [	
		· · ·			

	Authorized	Proposed						
Budget Category:	FFY 1999	FFY 2000						
				Care Street				
Personnel	\$4.9	\$14.3		20112	- <b>1</b>			
Travel	\$0.5	\$0.7						
Contractual	\$4.0	\$2.4			and a state of the second s			
Commodities	\$1.6	\$0.0						
Equipment	\$0.0	\$0.0		LONG RAI	NGE FUNDIN	G REQUIREM	ENTS	
Subtotal	\$11.0	\$17.4	Estimated	Estimated	·			
General Administration	\$1.0	\$2.3	FFY 2001	FFY 2002				
Project Total	\$12.0	\$19.7	\$0.0	\$0.0				
						Sector Sector		
Full-time Equivalents (FTE)	0.1	0.3				660 - 22 A		
		[	Dollar amounts	are shown in	thousands of	dollars.		
Other Resources					l			
Comments: Forage fish will be	obtained from	the stomachs	of sport caught	t large fish pre	dators to test	the feasibility	and effective	eness of
obtaining low cost, spatial and r	elative abunda	nce data on fo	orage fish in the	e Gulf of Alask	a. This study	will concentrat	te on Lower	Cook Inlet.
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	Destantion							FORM 3A

2000

Project Number: 00163K Project Title: APEX/Large Fish as Samplers Agency: DOI/USFWS FORM 3A AGENCY PROJECT DETAIL

Pers	sonnel Costs:		GS/Range/	Months	Monthly		Proposed
	Name	Position Description	Step	Budgeted	Costs	Overtime	FFY 2000
	D Roseneau	Pl ·	GS11/5	2.8	5,100		14.3
	V Byrd	Program Manager	GS13	0.8	0		0.0
				1			0.0
							0.0
							0.0
							• 0.0
		· · · · ·				•	0.0
<u>i</u>							0.0
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Į	· ,						0.0
<b>[</b> ].							0.0
	<u> </u>	<u> </u>				······	0.0
		Subtotal		3.6	5,100	0	
Ino	se costs associated with pro	gram management should be indicated by	placement of a	an ".		rsonnei i otai	\$14.3
Tra	vel Costs:	······		Round	lotal	Daily	Proposed
∥			Price	l rips	Days	Per Diem	FFY 2000
	Homer to Anchorage for EV	US Restoration workshop (V. Byrd)	2/5		3	150  -	0.7
				· ·			0.0
ł				· ·			0.0
							0.0
				· .			0.0
							0.0
	1						0.0
							0.0
I			<b>.</b>				0.0
							0.0
							0.0
	· · · · · · · · · · · · · · · · · · ·		• • • • • • • • • • • • • • • • • • • •	······································		Travel Total	\$0.7
					• · ·	F	ORM 3B
		Project Number: 00163K			•		ersonnel
	2000	Project Title: APEX/Large Fish as	Samplers				
		Agency: DOI/USEWS				·   ·	
1							

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Contractual Costs:				Proposed
Description				FFY 2000
page charges (\$1,000/pa	aper x 2)			2.0
poster prepartaion and p	printing			0.4
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				. •
3				
Nhon a non trustos ora:	anization is used the form 4A is required		Contractual Total	621
Commodition Costs:	anization is used, the form 4A is required.			Proposed
Description				1 FEV 2000
		· · · · · · · · · · · · · · · · · · ·		111 2000
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······································		•	Commodities lotal	\$0.0
·				
	Brojest Number: 00162K			
2000				ontractual
2000	Project Title: APEX/Large Fish as Samplers			&
	Agency: DOI/USFWS		Co	mmoditie
				<u> </u>
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Nev	v Equipment	Purchases:		Number	Unit	Proposed
Des	cription			of Units	Price	FFY 2000
						0.0
l						0.0
						0.0
						0.0
						0.0
						0.0
[						0.0
					·	0.0
· ·						0.0
						0.0
						0.0
					:	0.0
Tho	se nurchase	s associated wit	h replacement equipment should be indicated by placement of an R	New Fai	inment Total	\$0.0
FYI	sting Equipm	ent lisare	ar opidoonion of dupinon onould be indicated by pidoonion of dirty.		Number	Inventory
Des	cription	iont Osago.			of Units	Adency
F						7.90107
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[	× .	٦			[	
		•	Project Number: 00163K		FC	ORM 3B
	2000		Project Title: APEX/Large Fish as Samplers	]	Eq	uipment
	2000	· ·				DETAIL
l		<b>ل</b>				

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<sup>-</sup>Y00163A-T budget

	Authorized	Proposed						
Budget Category:	FFY 1999	FFY 2000						
Personnel	\$19.8	\$14.6					175 - 175 - 175 - 175 - 175 - 175 - 175 - 175 - 175 - 175 - 175 - 175 - 175 - 175 - 175 - 175 - 175 - 175 - 175	
Travel	\$0.0	\$0.0						
Contractual	\$0.0	\$0.0	19-10-10-10-10-10-10-10-10-10-10-10-10-10-	an a				
Commodities	\$0.0	\$0.0						
Equipment	\$0.0	\$0.0		LONG RAP	NGE FUNDING	<b>G REQUIREN</b>	<b>MENTS</b>	
Subtotal	\$19.8	\$14.6	Estimated	Estimated				
General Administration	\$3.0	\$2.2	FFY 2001	FFY 2002	•			
Project Total	\$22.8	\$16.8	\$10.0	\$0.0				
Full-time Equivalents (FTE)	0.3	0.2		Service and				
		· [	Dollar amounts	are shown in	thousands of	dollars.		
Other Resources		•						

Comments: This component will also coordinate the continuation of the historic review of the ecosystem structure in the Prince William Sound/Gulf of Alaska complex. Included in this review will be obtaining and synthesizing several forage fish data sets.

2000

Project Number: 00163L Project Title: APEX Historic Review Agency: DOI FORM 3A AGENCY PROJECT DETAIL

Per	sonnel Costs:		GS/Range/	Months	Monthly	· ·	Proposed
	Name	Position Description	Step	Budgeted	Costs	Overtime	FFY 2000
	J. Piatt	PI	GS13/6	2.0	7,300		14.6
							0.0
	· .						0.0
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	·						0.0
	1			· ·			0.0
							0.0
1							0.0
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<b> </b>	]	Qubtatel			7 000		0.0
∥	· · · · · · · · · · · · · · · · · · ·	Subiotai		2.0	7,300 	U reannal Tatal	\$14.6
	val Casta:		Tieket	Dound	Total	Doily	Proposed
Ina	Description		Price	Trine	Dave	Dally Por Diam	FIODOSED
╟───	Description		FILCO	inps	Days		0.0
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l	· · ·	•					0.0
							0.0
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]]							0.0
1						-	0.0
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	•	•					0.0
				·	4		0.0
					an <u>san an</u> an an san sa	Travel Total	\$0.0
r							
		Project Number: 001621				F	ORM 3B
	2000	Project Number, 00 103L				Pe	ersonnel
1	2000	Project little: APEX HISTOPIC Review	N		-	8	Travel
		Agency: DOI					DETAIL
L						L	

Contractual Costs:		Proposed
Description		FFY 2000
		0.0
Vhen a non-trustee organization is used, the form 4A is required.	Contractual Tot	al \$0.0
Commodities Costs: Description		FFY 2000
· · · · · · · · · · · · · · · · · · ·		0.0
· · · ·	Commodities Tota	ıl \$0.0
2000 Project Number: 00163L Project Title: APEX Historic Review Agency: DOI		FORM 3B contractual & commoditie

	Unit	Proposed
Description of Units	Price	FFY 2000
		0.0
		0.0
		0.0
		0.0
		0.0
		0.0
		0.0
		0.0
		0.0
		0.0
		0.0
		0.0
The second second state with an locate state state should be indicated by placement of an D New Earthman		0.0
	ent i otai	\$0.0
Existing Equipment Usage:	Number	Inventory
	or Units	Agency
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	FC	DRM 3B
		uinmont
∠UUU   Project Title: APEX Historic Review		
Agency: DOI	L	

FY00 -T budget

· · · · · · · · · · · · · · · · · · ·	Authorized	Proposed	Carles and the second	an a strange store	Man States				· · · · · · · · · · · · · · · · · · ·
Budget Category:	FFY 1999	FFY 2000							$\mathbf{R}$
		· · · · · · · · · · · · · · · · · · ·	1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.						
Personnel	\$20.3	\$38.0			22 Sec. 16 P				
Travel	\$1.6	\$2.5							
Contractual	\$10.0	\$5.0	1.250.2						
Commodities	\$2.7	\$4.5							
Equipment	\$0.0	\$0.0		LONG RAN	IGE FUNDING	G REQUIREN	<b>MENTS</b>		
Subtotal	\$34.6	\$50.0	Estimated	Estimated	*				
General Administration	\$3.7	\$6.1	FFY 2001	FFY 2002	_				
Project Total	\$38.3	\$56.1	\$10.0	\$0.0					_
				e i ser a digere	and a second				(2 <sup>72</sup> a <sup>2</sup> 1)
Full-time Equivalents (FTE)	0.3	0.7				an a			
		C	Dollar amounts	are shown in t	thousands of	dollars.			
Other Resources									
Comments: This component w Included in this review will be c	vill continue the obtaining and sy	historic review nthesizing sev	/ of the ecosys /eral forage fisl	em structure i 1 data sets.	n the Prince V	Villiam Sound	i/Gulf of Al	aska coi	mplex.
Comments: This component w Included in this review will be c	vill continue the obtaining and sy	historic review	<i>v</i> of the ecosys veral forage fis	em structure i 1 data sets.	n the Prince V	villam Sound	I/Gulf of Al	aska coi	mplex.
Comments: This component w Included in this review will be c	vill continue the obtaining and sy	historic review nthesizing sev	<i>v</i> of the ecosys veral forage fis	em structure i ı data sets.	n the Prince V	villam Sound	I/Gulf of Al	aska coi	mplex.
Comments: This component w Included in this review will be c	vill continue the obtaining and sy	historic review	<i>v</i> of the ecosys veral forage fis	em structure i 1 data sets.	n the Prince V	villam Sound	I/Gulf of Al	aska coi	mplex.
Comments: This component w Included in this review will be c	vill continue the obtaining and sy	historic review	<i>v</i> of the ecosys veral forage fis	em structure i 1 data sets.	n the Prince V	villam Sound	I/Gulf of Al	aska coi	mplex.
Comments: This component w Included in this review will be c	vill continue the obtaining and sy	historic review	<i>v</i> of the ecosys veral forage fis	em structure i 1 data sets.	n the Prince V	villam Sound	I/Gulf of Al	aska coi	mplex.

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FY00 -T budget

Per	sonnel Costs:	· · · · · · · · · · · · · · · · · · ·	· · · · ·	GS/Range/	Months	Monthly		Proposed
	Name	Position Description		Step	Budgeted	Costs	Overtime	FFY 2000
	P. Anderson	biologist		GS12/4	2.0	7,300		14.6
li -	S. Loy	biologist	•	GS9/1	6.0	3,900		23.4
1		· · · · ·					•	0.0
1	·		•					0.0
			•				-	0.0
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<u> </u>	<u></u>		· · · · · ·	an a				0.0
	· · ·		Subtotal		8.0	11,200	0	
						Pel	rsonnei lotai	\$38.0
Tra	vel Costs:			Ticket	Round	Total	Daily	Proposed
	Description			Price	Irips	Days	Per Diem	FFY 2000
1	Kodiak to Anchorage (EVO	S Workshop)		250		6	225	1.6
	Kodiak to Anchorage, APEX	Cmeeting		250	1	3	225	0.9
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1		Project Number: 001631					F0	ORM 3B
	2000	Project Title: ADEV/Liste		w of Earaca	Fish Data		-   Pi	ersonnel
1				worrorage	FISH Data		8	Travel
		Agency: NOAA						DETAIL
L	J							

FY0( \-T budget

Contractual Costs:			Proposed
Description			FFY 2000
web-based distributed da	tabase additions		5.0
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When a non-trustee orda	nization is used, the form 4A is required.	Contractual Total	\$5.0
Commodities Costs:			Proposed
Description		· · · · · · · · · · · · · · · · · · ·	FFY 2000
software upgrades		**************************************	2.5
presentation materials an	d preparation		2.0
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****		Commodition Total	CA E
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			10M 20
	Project Number: 001631		
2000	Project Title: APEX/Historic Review of Ecrege Eich Date		ntractual
	Access NOAA		×.
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New Equipment Purchases:	Number	Unit	Proposed
Description	of Units	Price	FFY 2000
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
	•		0.0
			0.0
			0.0
These supplicates acceptized with replacement equipment should be indicated by placement of on D	l Now Em	unment Total	
I nose purchases associated with replacement equipment should be indicated by placement of an R.		Ipment I otal	\$0.0
			inventory
Description			Agency
GIS equipment and software		1	NUAA
	•		
			ł
		· · · · · · · · · · · · · · · · · · ·	
Project Number: 00163L			
<b>2000</b> Project Title: APEX/Historic Review of Forage Fish Data		Ec	uipment
		ן ה	DETAIL

	Authorized	Proposed		2167262 V 1 <u>686</u> 0	a state of the state of the	* TOMORAU.	Sando Co	
Budget Category:	FFY 1999	FFY 2000						
				Sec. 19.23				
Personnel	\$24.3	\$7.2	and the second					
Travel	\$1.2	\$1.2	a line and					
Contractual	\$0.0	\$0.0						
Commodities	\$0.0	\$0.0						
Equipment	\$0.0	\$0.0		LONG RA	NGE FUNDIN	G REQUIREME	NTS	
Subtotal	\$25.5	\$8.4	Estimated	Estimated				
General Administration	\$3.6	\$1.1	FFY 2001	FFY 2002				
Project Total	\$29.1	\$9.5	\$10.0	\$0.0				
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Full-time Equivalents (FTE)	0.4	0.1						
			Dollar amounts	are shown in	thousands of	dollars.		
Other Resources								
Comments: This component w	ill continue the	historic review	of the ecosyst	em structure	in the Prince \	Villiam Sound/G	<b>Bulf of Alas</b>	ka complex.
Included in this review will be c	btaining and sy	nthesizing sev	veral forage fist	n data sets.				
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	Project Nu	mber: 0016	31					FURIVI 3A
2000	Project Titl	e APEX/Hi	storic Review	w of Forega	Fish Data	ļ		AGENCY
				w of i orage				PROJECT
<b>\</b>	Agency: Al	JFQG						DETAIL

Per	sonnel Costs:		GS/Range/	Months	Monthly		Proposed
	Name	Position Description	Step	Budgeted	Costs	Overtime	FFY 2000
	J. Blackburn	biologist III (Kodiak)	18	1.0	7,200		7.2
1	B. Bechtol	blologist II (Homer)	16	0.0	5,400	•	0.0
							0.0
							0.0
							. 0.0
		-					0.0
	· .			•			0.0
							0.0
						·	0.0
							0.0
							0.0
	[	· · ·	a di na datamina in data dagan janjara da			5	0.0
<b>  </b>		Subtotal		1.0	12,600	0	
					P6	rsonnel lotal	\$7.2
Tra	vel Costs:		Ticket	Round	Total	Daily	Proposed
	Description		Price	Trips	Days	Per Diem	FFY 2000
Hor			. 250	1	4	225	1.2
					•		0.0
		•					0.0
							0.0
							0.0
		,					0.0
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					•		0.0
		· .					0.0
		· ·					0.0
			•				0.0
			L			Traval Tatal	0.0
<u> </u>						Traver Total	<u>φι.</u> ζ
· [					]		
		Project Number: 00163		-			OKW 3B
	2000	P	ersonnel				
1		Agency: ADE&C	n of i orago			8	Travel
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Contractual Costs:		Proposed
Description		FFY 2000
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When a non-trustee organization is used, the form 4A is required.	Contractual Total	\$0.0
Commodities Costs:	······································	Proposed
Description		FFY 2000
	,	
	•	
		14 - C
	Commodities Total	\$0.0
		L
	F	ORM 3B
Project Number: 00163L	Co	ntractual
∠UUU Project Title: APEX/Historic Review of Forage Fish Data		&
Agency: ADF&G	Co	mmoditie
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FY0( -T budget

New	Equipment	t Purchases:			· · · · · · · · · · · · · · · · · · ·	Number	Unit	Proposed
Desc	cription			<u> </u>		of Units	Price	FFY 2000
					·			0.0
								0.0
								0.0
			••					0.0
								0.0
								0.0
			• •		•			0.0
								0.0
								0.0
{ }								0.0
Thos	se purchase	s associated w	ith replacement equipment st	hould be indicated by	placement of an R	New Fa	Inment Total	\$0.0
Exis	ting Equipn	nent Usage:					Number	Inventory
Desc	cription		······	·····	·····		of Units	Agency
	2000		Project Number: 0016 Project Title: APEX/His Agency: ADF&G	3L storic Review of F	Forage Fish Data		F( Ec	ORM 3B Juipment DETAIL

FY00 -T budget

	Authorized	Proposed	S. S. W. S. M. L.		es e de las menos		ALC: CHESS	Strate Contraction
Budget Category:	FFY 1999	FFY 2000						
			5					
Personnel	\$51.9	\$172.0	a and a second					
Travel	\$0.0	\$2.0		and the second second				
Contractual	\$130.0	\$48.5			Signal States			
Commodities	\$68.9	\$0.0				al de la presidente de la constante la constante de la constante de la constante de la constante d		
Equipment	\$0.0	<u>\$0.0</u>		LONG RAN	IGE FUNDING	<b>GREQUIRE</b>	EMENTS	
Subtotal	\$250.8	\$222.5	Estimated	Estimated				
General Administration	\$16.9	\$29.2	FFY 2001	FFY 2002	: 			
Project Total	\$267.7	\$251.7	\$251.7	\$0.0				
								i en en en en de service Normen en e
Full-time Equivalents (FTE)	1.7	3.5		an Charles an Ar Standard State				
		C	Oollar amounts	are shown in	thousands of c	ollars.		
Other Resources	\$370.0	\$250.0	\$250.0					
Funding for this project is from t	hree major sou	Irces: EVOS T	rustee Counci	l, Minerals Ma	nagement Ser	vice ,and N	ational Biok	ogical Service .
2000	Project Nur Project Title Agency: N	mber: 0016 e: Respons BS	3M e of Seabird	ls to Forage	Fish Densi	ty		FORM 3A AGENCY PROJECT DETAIL

Per	sonnel Costs:		GS/F	lange/	Months	Monthly	<u>.</u>	Proposed
<u> </u>	IName	Position Description	-	Step	Budgeted	Costs	Overtime	FFY 2000
	J. Piatt (donated by DOI)	Wildlife Biologist	GS14		0.0	7,670		0.0
1	G. Drew	Wildlife Biologist	GS12		6.0	5,698		34.2
1		Wildlife Biologist	GS9		12.0	4,063		48.8
l		Wildlife Biologist	GS9		12.0	4,062		48.7
	donated by DOI	Wildlife Biologist	GS9	· .	0.0	4,063		0.0
	donated by DOI	Wildlife Biologist	GS7		0.0	. 3,359		0.0
		Wildlife Biologist	GS7		12.0	3,359		40.3
1			· ·			:		0.0
	· ·							0.0
l								0.0
Į.								0.0
						-		0.0
		Subtota	al		42.0	32,274	· 0	
		·····		·		Pe	rsonnel Total	\$172.0
Tra	vel Costs:		`	Ticket	Round	Total	Daily	Proposed
	Description			Price	Trips	Days	Per Diem	FFY 2000
	travel to Pacific Seabird me	eeting		650	1	5	70	1.0
	travel to EVOS Workshop			650	1	5	70	1.0
4		· ·						0.0
II.		· ·						0.0
11								0.0
ł								0.0
							•	0.0
H						. *		0.0
	· ·							0.0
			· ·			·		0.0
1								0.0
<b> </b>	· · · · · · · · · · · · · · · · · · ·	·						0.0
	· · · · · · · · · · · · · · · · · · ·						Travel Total	\$2.0
Breight Number, 00400M							F	ORM 3B
	2000	Project Number: 00163M				,	P	ersonnel
1	2000	Project Title: Response of Seabir	ds to Fe	orage	⊢ish Densit	У .	8	
[		Agency: NBS				1		

Contractual Costs:			Proposed
Description			FFY 2000
Research (data synthesis and write up) Work Order publication charges (\$500/paper x 15 papers)			41.0 7.5
	· · · · ·	•	
	· · · · · · · · · · · · · · · · · · ·		
	· · · · · · · · · · · · · · · · · · ·	· .	
When a non-trustee organization is used, the form 4A	is required.	Contractual Total	\$48.5
Commodities Costs:			Proposed
Description		· · · · · · · · · · · · · · · · · · ·	FFY 2000
		•	
		Commodities Total	\$0.0
2000 Project Number: Project Title: Res Agency: NBS	00163M sponse of Seabirds to Forage Fish Density	FC Co Col	DRM 3B ntractual & mmoditie

New Equipment I	Purchases:	Number	Unit	Proposed
Description		of Units	Price	FFY 2000
Those purchases	associated with replacement equipment should be indicated by placement of an R.	New Equ	ulpment Total	\$0.0
Existing Equipme	nt Usage:		Number	Inventory
Description			of Units	Agency
2000	Project Number: 00163M Project Title: Response of Seabirds to Forage Fish Dens Agency: NBS	iity		DRM 3B Juipment DETAIL

FY0( .-T budget

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	Authorized	Proposed	e terrer and prove the	and the second secon				
Budget Category:	FFY 1999	FFY 2000				an ya Maria. Ar	(****), ********************************	an a
Personnel	\$0.0	\$0.0	and the second	an de la Caracter				
Travel	\$0.0	\$0.0					e sa asta are	and the second
Contractual	\$30.0	\$30.0						
Commodities	\$0.0	\$0.0						
Equipment	\$0.0	\$0.0		LONG RAN	NGE FUNDIN	IG REQUIRE	EMENTS	
Subtotal	\$30.0	\$30.0	Estimated	Estimated				
General Administration	\$2.1	\$2.1	FFY 2001	FFY 2002		·		
Project Total	\$32.1	\$32.1	\$32.1	\$0.0				
· · ·							en e	
Full-time Equivalents (FTE)	0.0	0.0						
			Dollar amounts	are shown in	thousands of	dollars.		
Other Resources	· · ·				· · ·			
The total FY96 budget for this p transferred from 96163I. These	roject increase additional cost	d by \$10,000 s will be reflec	to accommoda sted in personn	ate additional p nel and travel.	projected proj	ect statistica	al review. Th	e \$10,000 was
2000	Project Nur Project Titl Agency: No	mber: 0016 e: APEX: S DAA	30 Itatistical Re	eview				FORM 3A AGENCY PROJECT DETAIL
· · ·	L	<u></u> .		. <u></u>	<u>.</u>		<b>_</b>	-

]e 58

Per	sonnel Costs:		GS/Range/	Months	Monthly		Proposed
	Name	Position Description	Step	Budgeted	Costs	Overtime	FFY 2000
							0.0
	• •						0.0
							0.0
		•					0.0
							0.0
			•				0.0
	· .					1	0.0
			•				0.0
						<b>、</b>	0.0
		·	·				. 0.0
		· · ·				÷	0.0
		Subtotal		0.0	0	0	
					Pe	rsonnel Total	\$0.0
Trav	vel Costs:		Ticket	Round	Total	Daily	Proposed
		······································	Price	Inps	Days	Per Diem	FFY 2000
	·	· · ·					0.0
		, _					0.0
	•	•					0.0
·					· · ·		0.0
		•					0.0
							0.0
l							. 0.0
		•					0.0
		· · ·					0.0
		¢			·		0.0
<b> </b>			l			Travel Total	0.0
l							40.0
	· · · · · · · · · · · · · · · · · · ·					E	001 20
·		Project Number: 00163O	. ,		-		oreonnol
	2000	Project Title: APEX: Statistical Re	view				
	· ·	Agency: NOAA		•			

Contractual Costs:		Proposed
Description		FFY 2000
Statistical review contract		30.0
· .		
		, , , , , , , , , , , , , , , , , , ,
· · · ·		
· · · ·		
· ·		
When a non-trustee organization	is used, the form 4A is required. Contractual Total	\$30.0
Commodities Costs:		Proposed
Description		FFY 2000
	Commodities Total	\$0.0
	FC	DRM 3B
2000	Project Number: 001630 Co	ntractual
2000	Project Title: APEX: Statistical Review	&
	Agency: NOAA	mmoditie
		3

New Equipment Purchases:	Number	Unit	Proposed
Description	of Units	Price	FFY 2000
			0.0
			0.0
			0.0
			0.0
			0.0
		•	0.0
			0.0
			0.0
·			. 0.0
			0.0
			0.0
			0.0
Those purchases associated with replacement equipment should be indicated by placement of an R	New Equ	Ipment Total	\$0.0
Existing Equipment Usage:		Number	Inventory
Description		of Units	Agency
Project Number: 001630	· · ·		
Project Title: APEX: Statistical Review		FC	DRM 3B
		Eq	uipment
		[	DETAIL
	·		

	Authorized	Proposed						
Budget Category:	FFY 1999	FFY 2000				na na sina na s		
Personnel	\$25.8	\$26.1	estin Street	an an tha that an that			an a	
Travel	\$3.6	.\$3.3			all and the second s			
Contractual	\$0.0	\$0.0		d in conclu				
Commodities	\$0.6	\$0.6						
Equipment	\$0.0	\$0.0		LONG RA	NGE FUNDI	NG REQUIRE	MENTS	
Subtotal	\$30.0	\$30.0	Estimated	Estimated			·	
Indirect	\$0.0	\$0.0	FFY 2001	FFY 2002				
Project Total	\$30.0	\$30.0	\$30.0	\$0.0				·
							ne <sup>e</sup> l an agus a chuir an an ann an Chuir ann an ann an Anna an Anna an Anna	
Full-time Equivalents (FTE)	0.2	0.2						
		·	<b>Dollar</b> amounts	are shown in	thousands of	f dollars.		
Other Resources	·							

This project will provide guidance on study design, insure appropriate statistical inferences, and assistance during statistical analysis of data and in report preparation. The PI is a member of the Nearshore Vertebrate Predator project and will coordinate nearshore sampling in so far as possible.

The total FY96 budget for this project was increase by \$10,000 to accommodate additional projected project statistical review (start-up costs). The \$10,000 was transferred from 96163]. These additional costs were reflected in personnel and travel.

2000	Project Number: 001630 Project Title: APEX: Statistical Review Agency: Western EcoSystems Technology	FORM 4A Non- Trustee DETAIL
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Pers	onnel Costs:	Content of the second		Months	Monthly		Proposed
	Name	Position Description		Budgeted	Costs	Overtime	FFY 2000
	L. McDonald	Senior Biometrician		0.8	14,400		11.5
	•	Biometrician II		. 1.4	10,400		14.6
and and a second se		· ·					0.0
	•						0.0
	•						0.0
	•						0.0
123							0.0
1. 1. 1. T. A.	-	·					0.0
							0.0
and the second	•						0.0
							0.0
2.253	······································	L		·	24,800		0.0
<b>  </b>		Subi	Dial		24,000	sonnel Total	\$26.1
Tray	el Coete		Ticket	Round	Total	Daily	Proposed
	Description		Price	Trips	Davs	Per Diem	FFY 2000
	DIA to Anchorage		900	2			1.9
	meal per diem			_	- 10	35	0.4
6194 6194	hotel per diem (winter)				4	60	0.2
1997 (A) 1998 1997 (A) 1998	hotel per dlem (summer)				4	90	0.4
	car rental				10	40	0.4
							0.0
							0.0
							0.0
							0.0
							0.0
	· · ·	· · ·				-	0.0
<b>BAR</b>				<u> </u>			0.0
						Travel Total	\$3.3
r			,			r	·
· ·		Project Number: 001630		•		F0	ORM 4B
	2000	Project Number, 001000	Deview			P	ersonnel
1		Troject Hile. APEA: Statistical	Review			8	Travel
	· · ·	Agency: Western EcoSystems	Technology				DETAIL
L	I					. <b>L</b>	

FY0( -T budget

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Contractual Costs:			Proposed
Description			FFY 2000
	·		
· · · · · · · · · · · · · · · · · · ·			
	•		
		Contractual T	<b>`otal</b> \$0.0
Commodities Costs:		·	Proposed
Description			FFY 2000
shipping, postage, supplies			0.2
	<u>.</u>		
· · · · · · · · · · · · · · · · · · ·		• •	
	· · · · ·		
· ·			
· · ·		•	
	Co	ommodities T	otal \$0.6
	Project Number: 001630		FORM 4B
2000	Project Title: APEX: Statistical Review		Contractual
	Agency: Western EcoSystems Technology	-	
}	Agency, western Ecosystems rechnology		Commoaltie
	L		S

FY00 ·T budget

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New Equipment Purchases:	Number	Unit	Proposed
Description	of Units	Price	FFY 2000
			0.0 0.0 0.0 0.0
			0.0 0.0 0.0 0.0
Those purchases associated with replacement equipment should be indicated by placement of an R.	New Equ	lipment Total	0.0 0.0 0.0 \$0.0
Existing Equipment Usage:		Number	
Description	•	of Units	
	·		
2000 Project Number: 001630 Project Title: APEX: Statistical Review Agency: Western EcoSystems Technology		F( Ec	ORM 4B Juipment DETAIL

	Authorized	Proposed	select of sections.	s forth station	N. S. S. S. M.	References		
Budget Category:	FFY 1999	FFY 2000	and the second	a selection of the	e di si e anne			
						and the state of		
Personnel	\$0.0	\$0.0					n an	
Travel	\$0.0	\$0.0						
Contractual	\$67.5	\$86.1						
Commodities	\$0.0	\$0.0						
Equipment	\$0.0	\$0.0		LONG RAI	NGE FUNDIN	G REQUIREM	ENTS	
Subtotal	\$67.5	\$86.1	Estimated	Estimated				
General Administration	\$4.7	\$6.0	FFY 2001	FFY 2002	· ·			
Project Total	\$72.2	\$92.1	\$77.0	\$0.0				
Full-time Equivalents (FTE)	0.0	0.0						
		<u> </u>	Dollar amounts	are shown in	thousands of	dollars.		
Other Resources					·		I	
interactions are occurring betwe	en food availa	bility and the c	colonies being	studied by AF	ν <b>ΕΧ.</b>			
				•				
		· .						
<u>.</u>		<u></u>						
2000	Project Nur Project Title Agency: N(	mber: 0016 e: APEX Mo DAA	3Q odeling			· · ·		FORM 3A AGENCY PROJECT DETAIL

Per	sonnel Costs:		GS/Range/	Months	Monthly		Proposed
	Name	Position Description	Step	Budgeted	Costs	Overtime	FFY 2000
ļ	· ·						0.0
1		•					0.0
	· ·						0.0
		· ·			,		0.0
							. 0.0
I.							0.0
ľ							0.0
ļ.							
l)						ļ	0.0
							0.0
	· · · · · · · · · · · · · · · · · · ·	Subtotal		0.0	0	· 0	
					Pe	rsonnel Total	\$0.0
Tra	vel Costs:		Ticket	Round	Total	Daily	Proposed
∥	Description	· · · · · · · · · · · · · · · · · · ·	Price	Trips	Days	Per Diem	FFY 2000
		·					0.0
Ĩ.							0.0
		· .					0.0
1			1		1	}	0.0
ll i		· · ·					
							0.0
1							0.0
							0.0
		•		•			0.0
1							0.0
			1				0.0
						Travel Total	\$0.0
	······································						
				· ·		F	ORM 3B
	2000	Project Number: 00163Q				P	ersonnel
	2000	Project little: APEX Modeling		•		8	
		Agency: NOAA					DETAIL
L		· · · ·				L'	

Contractual Costs:		<u>, a an a</u>		Proposed
Description				FFY 2000
contract to H.T. Harvey and Asso	ociates for modeling			86.1
				· ·
• .	•			
· ·				
			· .	
	· · ·	•	•	,
	· .			
	· · ·			
When a pap trucket and a line the	is used the form (A) is required		Contractural Tatal	¢00.4
When a non-trustee organization	i is used, the form 4A is required.		Contractual I otal	\$80.1
			•	Proposed
Description				FFY 2000
		•		
	· ·		·	
	• • •			
	· · ·			
·				
	•	•		
	· · · · · · · · · · · · · · · · · · ·			
	······································		Commodities Total	\$0.0
	•		FC	RM 3B
	Project Number: 00163Q			ntractual
2000	Project Title: APEX Modeling			g.
	Agency: NOAA	• •		CK
				mmoditie
		· ·		S

New Equipment Purchases:		Number	Unit	Proposed
Description		of Units	Price	FFY 2000
		· ·		0.0
				0.0
				0.0
				. 0.0
				0.0
				0.0
	•			0.0
				0.0
				.0.0
				0.0
				0.0
		<u> </u>	· · · · · · · · · · · · · · · · · · ·	0.0
Those purchases associated wi	th replacement equipment should be indicated by placement of an R.	New Equ	lipment Total	\$0.0
Existing Equipment Usage:		·	Number	Inventory
Description	·		of Units	Agency
			• •	
	· · · · · ·	2		
			-	
		·	L	
	Project Number: 00163Q		E/	JOW 3B
2000	Project Title: APEX Modeling			uinment
2000	Agency: NOAA			
Ι. Ι			. •	
			L	

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	Authorized	Proposed			a an		E VILLE RECTR	
Budget Category:	FFY 1999	FFY 2000						
Personnel	\$17.5	\$23.5		en ander en der der Reisen ander der der der der der der der der der		han California (m. 1975) 1975 - State California (m. 1975) 1975 - State California (m. 1975)	in de la compañía de Compañía de la compañía	
Travel	\$5.3	\$5.3						
Contractual	\$44.7	\$57.3	ing and the set					
Commodities	\$0.0	\$0.0						
Equipment	\$0.0	\$0.0		LONG RA	NGE FUNDIN	G REQUIRE	MENTS	
Subtotal	\$67.5	\$86.1	Estimated	Estimated				
Indirect (0%)	\$0.0	\$0.0	FFY 2001	FFY 2002				1
Project Total	\$67.5	\$86.1	\$80.0	\$70.0				
· ·								
Full-time Equivalents (FTE)	0.1	0.1	S. C. S. Sales					
· · ·			Dollar amounts	are shown in	thousands of c	dollars.		
Other Resources								·
This project will develop models	s of foraging eff	ort and succe	ss as it relates	to breeding p	roductivity. Re	sults will tes	t the degree to v	which food
limitation is affecting recovery, i	ndicate the me	chanisms by v	which this could	d come about	, and identify th	ne scale at w	hich interaction	s are
occurring between food availab	ility and the col	onies being s	tudied by APE)	<b>K.</b> .	•			
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			С					•
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·····	· ·							
Projec	t Number: 0	01630					F	ORM 4A
		K Modolina						Non-
				· .				Trustee
	o <u>y</u> : H. F. Harv	ey & Assoc	ciates				· ·	DFTAIL
			•			.	. <u>Ľ</u>	

Personnel Costs:				Months	Monthly		Proposed
	Name	Position Description		Budgeted	Costs	Overtime	FFY 2000
	D. Ainley	Co-PI		1.4	15,000		21.0
1999 - 1999 1997 - 1997 1997 - 1997 - 1997	S. Terrill	Co-Pl		0.1	8,450		0.8
		admin. support		0.1	8,000		0.8
1.91-5 141		graphic artist	$\partial \langle \langle \phi^{2} \rangle \rangle = \langle \phi^{2} \rangle$	0.1	9,150		0.9
						-	0.0
						<u>*</u>	0.0
	·	. ·					0.0
							0.0
							0.0
Sec		· ·					0.0
							0.0
							0.0
	· · · · · · · · · · · · · · · · · · ·	Subtotal		1.7	40,600	0	
					- P0	rsonnel I otal	\$23.5
Trav	el Costs:	· · · · · · · · · · · · · · · · · · ·	Ticket	Round	Total	Daily	Proposed
write skiry.	Description	······································	Price	Trips	Days	Per Diem	FFY 2000
SFO-Anchorage (one trip for science workshop)			1,000		4	125	1.5
Portiand-Anchorage			900	1	4	125	1.4
St. Jonns, NFLD to Anchorage			1,000	. 1	6	125	1.8
19-12 AV	conterence		250	1	3	110	0.6
							0.0
	· · ·	· · · ·				•	0.0
							0.0
							0.0
14000				l .			0.0
							0.0
					·	Travel Total	\$5.3
Ľ						114701 10(4)	<u> </u>
· · · ·	<u> </u>		·· .	· · ·			
.		Project Number: 00163Q					
	2000	Project Title: APEX Modeling					
		Agency HT Harvey & Associates					
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Contractual Costs:	Proposed
Description	FFY 2000
subcontract: ECI (Glenn Ford) 3.5 months @ \$12,610/mo.	44.1
GIS tech., 0.4 month @ \$10,100/mo.	4.0
Memorial Univ., D.C., Schneider, .4mo. @ \$12,610/mo.	5.0
subcontract fee	· 4.2
Contractual Total	\$57.3
Commodities Costs:	Proposed
Description	FFY 2000
· · ·	-
	х. - С С С С С С С С
Commodities Total	\$0.0
	ψυ.υ
Project Number: 00163Q	
2000 Project Title: APEX Modeling	ntractual
	ά.
Agency: H.I. Harvey & Associates	mmoditie

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FY00 ·T budget

New Equipment Purchases:	Number	Unit	Proposed
Description	of Units	Price	FFY 2000
	· ·		0.0
		•	0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
		• *	0.0
			0.0
These numbers associated with replacement equipment should be indicated by placement of an D		upmont Total	
Those purchases associated with replacement equipment should be indicated by placement of an R.		Ipment Iotal	\$0.0
Existing Equipment Usage:		of Units	
		<u>.</u>	
	·		
	<b>.</b> .		
		<u> </u>	
Project Number: 001630	·		
	}		Juipment
Ayency. n. i. naivey & Associates	l l	·   L	JETAIL
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FY00 ·T budget

	Authorized	Proposed	A.L. MARINE	914 <u>66</u> 8366283			S. 1997	
Budget Category:	FFY 1999	FFY 2000		Same and the second				
	·							
Personnel	\$76.4	\$87.0	n de la companya de La companya de la comp					
Travel	\$5.9	\$2.0		an a			and the second	
Contractual	\$9.7	\$7.9			(1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,			
Commodities	\$9.6	\$0.0				an the second second		
Equipment	\$1.0	\$5.0		LONG RAN	IGE FUNDING	REQUIREM	ENTS	
Subtotal	\$102.6	\$101.9	Estimated	Estimated	·			•
General Administration	\$12.1	\$13.6	FFY 2001	FFY 2002			· · ·	•
Project Total	\$114.7	\$115.5	\$85.0	\$0.0			·	·
• • •								
Full-time Equivalents (FTE)	1.5	1.5	N. L. P. S.					
		C	Ollar amounts	are shown in t	housands of d	ollars.		
Other Resources			L				<u> </u>	
This project will continue to refine	e the Marbled I	Murrelet produ	ctivity index de	eveloped in FY	′95-FY96.		• *	
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´								FORM 3A
	Project Nur	mber: 0016	3R				l .	
2000	Project Title	e: Marbled I	Murrelet Pro	ductivity			1	
	Agency 11	SEWS	······································					
	progenuy. Uv	51 440						DETAIL
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· · · · · · · · · · · · · · · · · · ·								

Per	sonnel Costs:		GS/Range/	Months	Monthly		Proposed
	Name	Position Description	Step	Budgeted	Costs	Overtime	FFY 2000
	K. Kuletz	Pl	GS 11/6	12.0	6,000		72.0
	Kendall	GIS/Biologist	GS 7/1	2.0	2,900		5.8
		bio.tech.	GS5	4.0	2,300		9.2
							0.0
		· ·					0.0
							• 0.0
						•	0.0
							0.0
							0.0
							. 0.0
11							0.0
┣	l		the second state of the second state of the	19.0	11 200		0.0
	·	Subiotal	a <sup>t</sup> a ang sa	10.01	1,200	sonnel Total	\$87.0
Tra	val Coete:	<u> </u>	Ticket	Round	Total	Daily	Proposed
	Description		Price	Trips	Davs	Per Diem	FFY 2000
<b>  </b>	travel to Pacific Seabird Gro	oun meeting	650	1	5	70	1.0
	travel to Ecological Socletv	meeting	650	1	5	70	1.0
ł					-	:	0.0
							0.0
							0.0
							0.0
		•					0.0
	·	· · · ·				· · ·	0.0
							0.0
							0.0
ľ		· .		•			0.0
	<u> </u>		l				0.0
						Travel Total	\$2.0
r	·	······································			· · · · · · · · · · · · · · · · · · ·		
··· .		Brolost Numbers 00462D				F	) ORM 3B
	2000	Project Number: 00163K			••	P	ersonnel
		Project little: Warbled Murrelet Pro	Dauctivity	•		8	Travel
		Agency: USFWS				l I	
L	······································					L	

FY0( -T budget

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Contractual Costs:	Proposed
Description	FFY 2000
telephone service in office	0.3
film processing, postage, and freight	0.5
publication page charges (\$1,000/paper x 6)	6.0
analyze diet samples (70 x \$15)	· 1.1
	1
	1
When a non-trustee organization is used, the form 1A is required	\$7.0
Commodifies Costs:	Bronosod
Description	FEV 2000
	111 2000
	-
	\$0.0
Project Number: 00163R	
2000 Project Title: Marbled Murrelet Productivity	ntractual
	&
	mmoditie
	S

New Equipmen	t Purchases'		Number	Unit	Proposed
Description	LI UIVII4303.		ofUnits	Price	FFY 2000
computer s	oftware upgrade		2	1.000	2.0
computer			1	3,000	3.0
				ŕ	0.0
					0.0
				1	0.0
					0.0
	ι.				0.0
					0.0
					0.0
					· 0.0
	. *				0.0
					0.0
Those purchase	es associated wi	h replacement equipment should be indicated by placement of an R.	New Eau	Jipment Total	\$5.0
Existing Equipr	nent Usage:			Number	Inventory
Description	<u> </u>			of Units	Agency
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ŧ.					
			1		المستعدي وغيريها
		Project Number: 00163R		E	20 100
2000	· ·	Project Title: Marbled Murrelet Productivity	1		JIXIVI JD
2000		Agency: USFWS	ļ		
				l L	
L	<b></b> .'		J	. · <b>L</b>	

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FY0C -T budget

· · · · · · · · · · · · · · · · · · ·	Authorized	Proposed					الم	
Budget Category:	FFY 1999	FFY 2000	and in a star when a set					
· · · · · · · · · · · · · · · · · · ·		· .	States States			5 1 2 . T 4 3 V 3	1. 1. N. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1.	C. C. PALAS
Personnel	\$0.0	\$0.0		the All			a dan sana sa	and the second
Travel	\$0.0	\$0.0	and the second	an a				
Contractual	\$109.2	\$109.4						
Commodities	\$0.0	\$0.0						
Equipment	\$0.0	\$0.0	•	LONG RA	NGE FUNDIN	IG REQUIREM	IENTS	
Subtotal	\$109.2	\$109.4	Estimated	Estimated				
General Administration	\$7.6	\$7.7	FFY 2001	FFY 2002				
Project Total	\$116.8	\$117.1	\$75.1	\$0.0				
	·							
Full-time Equivalents (FTE)	0.0	0.0		and a second	an a	4. <sup>7</sup> .7.7.7	in Maria	
•			Dollar amounts	are shown in	thousands of	dollars.		
Other Resources								
Comments: In FY00 this project	ct complete ana	lysis on jellyfi:	sh consumptio	n rates and w	riteup for final	report.		
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<u></u>	·		· · · · · · · · · · · · · · · · · · ·					
		· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	· · ·			7 -	
	Project Nur	nher: 0016'	35					FORM 3A
2000	Droject Titl	nden ov 10. Notes	oo Competii		odatoro of l	Tichoo		AGENCY
2000			as competin	ors and Pro	edators of I	-isnes		PROJECT
	Agency: N	OAA					. [ ]	
L]							j L	
	h		·					

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FY0 \-T budget

Per	sonnel Costs:		GS/Range/	Months	Monthly		Proposed
	Name	Position Description	Step	Budgeted	Costs	Overtime	FFY 2000
			•				0.0
							0.0
							0.0
1	· ·						0.0
							0.0
		· · · · · · · · · · · · · · · · · · ·					0.0
1	·						0.0
						· ·	0.0
					· · .		0.0
	· · · ·						0.0
1							-0.0
	· · · · · · · · · · · · · · · · · · ·			0.0			0.0
⊪—	······································	Subtotal		0.0		U Teannal Tatal	<u> </u>
			Tiolech	Davind			
Ira				Round	Total		Proposed
<b> </b>			Flice	Tips	Days		0.0
		· · · ·		1		·	0.0
							0.0
ł		· .					0.0
	}						0.0
			ļ				0.0
il 🛛		•					0.0
1		·	1	· ·			0.0
		•					0.0
	· · ·						0.0
							0.0
							0.0
					•	Travel Total	\$0.0
	· · · · · · · · · · · · · · · · · · ·	F			······	<u> </u>	
		· · · · · · · · · · · · · · · · · · ·	· ·			F	ORM 3B
	2000	Project Number: 00163S			•••••	P	ersonnel
	2000	Project Title: Jellyfish as Competit	ors and Pre	dators of Fis	shes		Travel
		Agency: NOAA					
					•		
				. •			

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<b>Contractual Cost</b>	s:	Proposed
Description	·	FFY 2000
jelly fish as co	ompetitors and predators contract with Horn Point Environmental Laboratory	109.4
		,
i		
When a non-trust	ee organization is used, the form 4A is required.	\$109.4
Commodities Co		Proposed
Description		FFY 2000
_	· · ·	
•		
	· ·	
	Commodifice Tota	1 000
		1 <del>4</del> 0.0
		OPM 2P
	Project Number: 00163S	ontroctuol
2000	Project Title: Jellyfish as Competitors and Predators of Fishes	ontractual
		20 - 141
		ommoditie
······································		S
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ıge 80

FY0( -T budget

New Equipment Purchases:	Number	Unit	Proposed
Description	of Units	Price	FFY 2000
			0.0
			0.0
			0.0
			0.0
			0.0
			· 0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
	L		0.0
Those purchases associated with replacement equipment should be indicated by placement of an R.	New Equ	lipment Total	\$0.0
Existing Equipment Usage:	· · · · · · · · · · · · · · · · · · ·	Number	Inventory
Description	· · · · · · · · · · · · · · · · · · ·	of Units	Agency
	•		
· ·			
· ·			
		I <u></u>	
Project Number: 00163S		FC	ORM 3B
2000 Project Title: Jellyfish as Competitors and Predators of F	ishes	Eq	uipment
Agency: NOAA			DETAIL
	<u> </u>	r -	

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	Authorized	Proposed					A AN AL AND A MARKED	a let die met
Budget Category:	FFY 1999	FFY 2000	an a					
¥¥	· · · · · · · · · · · · · · · · · · ·							
Personnel	\$54.6	\$68.1		the set of	an a			
Travel	\$15.8	\$4.0						
Contractual	\$3.5	\$3.0						
Commodities	\$2.5	\$1.4		Carles Server				Commissione Commissione
Equipment	\$0.0	\$0.0		LONG RA	NGE FUNDIN	IG REQUIREN	MENTS	
Subtotal	\$76.4	\$76.5	Estimated	Estimated				
Indirect (43%) (not on equipmen	\$32.8	\$32.9	FFY 2001	FFY 2002				· ·
Project Total	\$109.2	\$109.4	\$70.2	\$0.0				
			1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1					
Full-time Equivalents (FTE)	1.3	1.3		and a strack			a landah ing Ju	$\in \{1, 2, 2, 3, 1, 1\}$
· · .		. C	ollar amounts	are shown in	thousands of	dollars.		
Other Resources			_					
This project will investigate Jelly	ish as competi	tors and preda	ators of fishes	in Prince Willia	am Sound.			;
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		•			•			
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2000

Project Number: 00163S Project Title: Jellyfish as Competitors and Predators of Fishes Name: Horn Point Environmental Laboratory FORM 4A Non-Trustee DETAIL

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FY0 -T budget

Pers	onnel Costs:	general and an and the second and a large the second second second second second second second second second s		Months	Monthly		Proposed
	Name	Position Description		Budgeted	Costs	Overtime	FFY 2000
	J. Purcell	PI		3.0	8,700		.26.1
şk V	M. Leonard	technician .		12.0	3,500		42.0
							0.0
							0.0
10 19 10 1 10 10 10		·					0.0
							0.0
S. Con State			ng na isr na ig				0.0
14		· · · ·					. 0.0
tin di Kata di Kata di		· · ·					0.0
Y.			1. N. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1.				0.0
2 2 1 2 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2			an an seacht a seacht Seacht an Seachtaire				0.0
C. C. C. C. C.		Subtotal		1.3	12,200	0	Settings for s
			1		Pe	rsonnel Total	\$68.1
Trav	el Costs:		Ticket	Round	Total	Daily	Proposed
	Description	· · · · · · · · · · · · · · · · · · ·	Price	Trips	Days	Per Diem	FFY 2000
	Maryland to Anchorage, EV	OS Annual meeting (RT)	1,000	1	5	200	2.0
	Maryland to Anchorage, AP	EX meeting (RT)	1,000	. 1	5	200	2.0
						*	0.0
635		-					• 0.0
						. •	0.0
		· .					0.0
							0.0
					•		0.0
							0.0
							0.0
	•						0.0
						<b>Travel Total</b>	\$4.0
	· · ·						
	· · ·	Designed Mumbers 004000				F	ORM 4B
		Project Number: 001638			- • • •	P	ersonnel
1 '	2000	Project Title: Jellytish as Competi	tors and Pre	eaators of Fi	snes	8	Travel
		Name: Horn Point Environmenta	l Laboratory				DETAIL
L	· · · ·		•				
						1	

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Contractual Costs:		Proposed
Description		FFY 2000
photocopying		0.5
computer services		2.2
communications		0.3
· ·		
· ·		
•		
-		
	Octor And T	-1-1 00.0
		otal \$3.0
Commodities Costs:	•	Proposed
Description		FFY 2000
laboratory supplies		0.4
publication costs		1.0
ν.		
	Commodities To	val \$14
		FORM AR
	Project Number: 00163S	Contractual
2000	Project Title: Jellyfish as Competitors and Predators of Fishes	Contractual
· · · · ·		Č
	Name: Horn Point Environmental Laboratory	Commoditie
LJ		S

FY0C -T budget

New Equipment Purchases:	Number	Unit	Proposed
Description	of Units	Price	FFY 2000
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
	í		0.0
			0.0
Those purchases associated with replacement equipment should be indicated by placement of an R.	New Equ	lioment Total	\$0.0
Existing Equipment Usage:		Number	
Description		of Units	
laptop computer		1	
disecting microscope		2	
CUE-2 image analysis system	•	1	
desktop computer		1	en al care
	·		
· · · ·			
	· .		
		· •	Ale des la serie de la serie La care e des la care de la serie La care e des la care des la series
	h	<u> </u>	
Project Number: 00163S		[]	
Project Title: Jellyfish as Competitors and Predators of F	shes	F0	ORM 4B
2000 Name: Horn Point Environmental Laboratory	·	Ec	uipment
		[	DETAIL

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FY00 T budget

	Authorized	Proposed						
Budget Category:	FFY 1999	FFY 2000					e service a service of	ana di salah di salah
Personnei	\$0.0	\$0.0					and the second	
Travel	\$0.0	\$0.0						
Contractual	\$54.4	\$101.4						
Commodities	\$0.0	\$0.0	and the second					
Equipment	\$0.0	\$0.0		LONG RAI	NGE FUNDIN	G REQUIREM	IENTS	an na shekara na shekara sheka A
Subtotal	\$54.4	\$101.4	Estimated	Estimated				
General Administration	\$3.8	\$7.1	FFY 2001	FFY 2002				
Project Total	\$58.2	\$108.5	\$30.3					
Full-time Equivalents (FTE)	0.0	0.0					an a	
		C	Dollar amounts	are shown in	thousands of	dollars.	e gerek war over trette verstaat geveen	
Other Resources						T		1
In FY00 this project will continue	of aerial data	synthesis and	write up of fina	al report and b	eain work on	manuscripts.	·····	
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	Distant		о <del>т</del>		-		Į. [	FORM 3A
2000			31	×				AGENCY
2000	Project little	e: Aeriai Sl	irveys					PROJECT
<b>.</b> .	Agency: A	DFG						DETAIL
			-			_		
1	L			-		<u></u>	-1	
7					,			

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Pers	onnel Costs:		GS/Range/	Months	Monthly		Proposed
	Name	Position Description	Step	Budgeted	Costs	Overtime	FFY 2000
							0.0
							0.0
							• 0.0
							0.0
							0.0
		· ·					0.0
	·						0.0
							0.0
							0.0
							0.0
							0.0
┠───┘	·	Subtotal					0.0
	· · · · · · · · · · · · · · · · ·	Subiola		<u> </u>	Pa	rsonnel Total	\$0.0
Tra	el Costs'		Ticket	Round	Total	Daily	Proposed
F	Description		Price	Trips	Davs	Per Diem	FFY 2000
		· · · · · · · · · · · · · · · · · · ·					0.0
				1 · ·			0.0
				ļ Ì			0.0
							0.0
	·						0.0
	•			· ·	•		0.0
		· .					0.0
							0.0
							0.0
			· .				0.0
	·		· ·		· •		0.0
	· ·		l	<u> </u>			0.0
						Travel Total	\$0.0
r		·····					
		Project Number 00182T	•.			F F	ORM 3B
	2000	Project Number: 001031		:		P	ersonnel
1 '		A SECTION AND A				8	& Travel
l		Agency: ADFG					DETAIL
L				•		L	

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Description FFY When a non-trustee organization is used, the form 4A is required. Commodities Costs: Description FFY Commodities Costs: Description FFY Commodities Total Project Number: 00163T	Contractual Costs:				Proposed
When a non-trustee organization is used, the form 4A is required. Contractual Total Commodities Costs: Propescription FFY Commodities Total Commodities Total Project Number: 00.163T	Description				FFY 2000
When a non-trustee organization is used, the form 4A is required. Commodifies Costs: Description FFY Commodifies Commodifies FFY Commodifies Commodifies FORM FORM FORM FORM FORM FORM					
When a non-trustee organization is used, the form 4A is required. Contractual Total Commodifies Costs: Properties Properties Total Commodifies Total Project Number: 00163T					
When a non-trustee organization is used, the form 4A is required. Commodities Costs: Prop Description FFY Commodities Total Project Number: 00163T			, ·	5.	
When a non-trustee organization is used, the form 4A is required. Commodities Coets: Project Number: 00163T FORM					
When a non-trustee organization is used, the form 4A is required.       Contractual Total         Commodities Costs:       Project Number: 00163T	, ,				
When a non-trustee organization is used, the form 4A is required.       Contractual Total         Commodities Costs:       Proprogram         Description       FFY         Operation       Commodities Total         Project Number: 00163T       FORM		· · · · · · · · · · · · · · · · · · ·			
Commodities Costs: Description FFY Commodities Total Project Number: 00163T FORM	When a non-trustee orga	inization is used, the form 4A is required.	·	Contractual Tota	\$0.0
Description FFY Commodities Total Project Number: 00163T	Commodities Costs:				Proposed
Commodities Total Project Number: 00163T	Description	**************************************	·		FFY 2000
Commodities Total Project Number: 00163T					
Commodities Total Project Number: 00163T					
Commodities Total					
Commodities Total			· · ·	•	
Project Number: 00163T				Commodities Total	\$0.0
2000 Project Title: Aerial Surveys & Common & Co	2000	Project Number: 00163T Project Title: Aerial Surveys Agency: ADFG		F( Cc Cc	ORM 3B ontractual & ommoditie

FY00 T budget

New Equipment Purchases:		Number	Unit	Proposed
Description	· · · · · · · · · · · · · · · · · · ·	of Units	Price	FFY 2000
				0.0
				0.0
				0.0
· ·				0.0
				0.0
				0.0
				0.0
· ·				. 0.0
				0.0
				0.0
				0.0
	:			0.0
Those purchases associated wit	h replacement equipment should be indicated by placement of an R.	New Equ	lipment Total	\$0.0
Existing Equipment Usage:			Number	Inventory
Description			of Units	Agency
•				
		•		
	•	-		
li -				
Landre all and a second se				
				DM 20
2000	Project Number: 00163T			
	Project Title: Aerial Surveys			
	Agency: ADFG			
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	Authorized	Proposed								1.1
Budget Category:	FFY 1999	FFY 2000				$\sum_{i=1}^{n-1} \sum_{j=1}^{n-1} \sum_{i=1}^{n-1} \sum_{j=1}^{n-1} \sum_{i=1}^{n-1} \sum_{j=1}^{n-1} \sum_{i=1}^{n-1} \sum_{j=1}^{n-1} \sum_{j=1}^{n-1} \sum_{i=1}^{n-1} \sum_{j=1}^{n-1} \sum_{j=1}^{n-1} \sum_{j=1}^{n-1} \sum_{j=1}^{n-1} \sum_{j=1}^{n-1} \sum_{j=1}^{n-1} \sum_{i=1}^{n-1} \sum_{j=1}^{n-1} $				
								an a' d'a Canadar a sa a		
Personnel	\$24.3	\$66.7								5.4 1 1 1
Travel	\$6.2	\$2.6								
Contractual	\$12.7	\$5.1		ir faðarlið H	x providence in the second			an sa sa	$X \in \{1, 2, 5\}$	
Commodities	\$0.3	\$0.8				4. A.				
Equipment	\$0.0	\$6.0		LONG RA	ANGE FUND	DING REQ	JIREME	NTS		
Subtotal	\$0.0	\$81.2	Estimated	Estimated						
Indirect (25% TDC)	\$43.5	\$20.2	FFY 2001	FFY 2002						
Project Total	\$54.4	\$101.4	\$43.4							
	· · · · ·		Contraction of the second				California (California)			
Full-time Equivalents (FTE)	0.4	1.0			A Sector Sec.		Marin 1964 - A	6 C		
		1	· 1996、2019-2019年4月,中央大学校的第三人称单数的大学校	n an	an san an ann a' an	de 13e is Ser own Ox Down 3 e Se	a de la constanción d	a desta a de ser	andal of second finited for	and an and the second
Other Resources	······································		· ·		T			•	T	
The indicast sale of OEN TOO as	, n - u offete d by									
In FY00 this project will continue		oynaroolo ana					1900.			
In FY00 this project will continue										
In FY00 this project will continue					, ,	· ·				
In FY00 this project will continue										
In FY00 this project will continue										
In FY00 this project will continue										
In FY00 this project will continue										
In FY00 this project will continue					<b>.</b>				· .	
In FY00 this project will continue										

Pers	onnel Costs:	n yn de yn	1	Months	Monthly		Proposed
	Name	Position Description		Budgeted	Costs	Overtime	FFY 2000
14.62	Brown, E.	PI		5.0	6,200		31.0
	Moreland, S.	lab. tech.	ar en ser ser ser an ar	3.0	4,300		12.9
Sec. 191	Vallerino, M.	programmer	enter de la construcción de la cons	1.5	5,000		7.5
	Coyle, K.	research associate		1.0	5,400		5.4
	Jun, M.	research assistant professor		• 1.0	4,700		4.7
an a	Bary, R.	associate professor		0.5	10,300		5.2
	,						0.0
12	•				-		0.0
			$(S, \rho) \in \{1, 2, 3, 5, 5, 5, 5, 5, 5, 5, 5, 5, 5, 5, 5, 5,$		•		0.0
1.23	•		and a second s				0.0
							0.0
					05.000		0.0
<b> </b>		Subtota	an strandard and	1.0	35,900 Bo	U Totol	¢66.7
	val Casta		Tieleek	Dound	Fe		
ITA	Description		Price	Trine	· I Otal	Daily Per Diem	FEV 2000
Seletar	Fairbanks to Anchr	orage (EVOS meeting)	200	2	Bays	200	1.4
	Fairbanks to Anche	prage (seminar)	200	- 1	5	200	1:2
					_		0.0
Standards of							0.0
							0.0
							0.0
				· ·			0.0
		·	1				0.0
	х -						0.0
							0.0
	τ						0.0
							0.0
L						Travel Total	\$2.6
		Project Number: 00162T				F	ORM 4B
1 .	2000	Project Title: Acrial Survey				P	ersonnel
1.		Fruject rite. Aerial Surveys	•			8	k Travel
{		Name: University of Alaska Fairb	anks				DETAIL
L					·	<b>L</b>	

FY00163A-T buc

Contractual Costs:		Proposed
Description		FFY 2000
contract with PWSSC to provide	pregramming for output of acoustic data on zooplankton	4.6
communications		0.3
copy/reproduction		0.2
·		
-		
	Contractual Tot	ai \$5.1
Commodities Costs:		Proposed
Description		FFY 2000
		u - 90.8
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FY00 -T budget

New Equipment Purchases:	Number	Unit	Proposed
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Those purchases associated with replacement equipment should be indicated by placement of an R.	New Eq	ulpment Total	\$6.0
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00169

# A Genetic Study to Aid in Restoration of Murres, Guillemots and Murrelets to the Gulf of Alaska

Project Number:	00-169
Restoration Category:	Research
Proposer:	Queen's University (V.L. Friesen) & DOI (J.F. Piatt)
Lead Trustee Agency:	DOI
Cooperating Agencies:	U.S. Geological Survey
Alaska SeaLife Center:	no
Duration:	4th year, 4-year project
Cost FY00:	\$19.2
Geographic Area:	Gulf of Alaska and neighboring areas
Injured Resource:	common murre, pigeon guillemot, marbled murrelet, Kittlitz's

#### ABSTRACT

Populations of common murres, pigeon guillemots, and marbled and Kittlitz's murrelets suffered high mortalities following the *Exxon Valdez* Oil Spill. We propose to finish our molecular analyses to measure genetic differentiation and gene flow among colonies of these species. This project will aid restoration by 1) determining the geographic limits of populations affected by the Spill, 2) identifying sources and sinks, and 3) identifying appropriate reference or 'control' sites for monitoring. As incidental results, it will also reveal cryptic species and subspecies, indicate the importance of inbreeding and small effective population sizes in restricting recovery, and suggest suitable source colonies for translocations.



Submitted 13 April 1999

#### INTRODUCTION

In the present proposal, we propose to complete our genetic research to aid restoration of common murres (*Uria aalge*), pigeon guillemots (*Cepphus grylle*), marbled murrelets (*Brachyramphus marmoratus*) and Kittlitz's murrelets (*B. brevirostris*) to the Gulf of Alaska. Specifically, in FY00 we proposed to use data collected in previous years on DNA sequence variation in mitochondrial DNA (mtDNA), microsatellites and nuclear introns to estimate gene flow and genetic differentiation among colonies of each species from the Spill area and outside sites. We have just completed the second year of this project: preliminary analyses indicate that gene flow occurs among colonies of common murres, that common and thick-billed murres (*U. lomvia*) hybridize extensively in the Gulf of Alaska, and that the present approach should provide reliable colony-specific markers for identifying the origins of birds killed by the Spill.

Marbled and Kittlitz's Murrelets.-Our previous studies of geographic variation in allozymes and cytochrome b sequences of murrelets indicated that the Asian and North American subspecies of marbled murrelets represent cryptic species that have been genetically isolated for 5-6 million years and that must be managed independently (Friesen et al. 1996a). Preliminary results from this study also suggested that North American populations of marbled murrelets may be genetically differentiated, and that Kittlitz's murrelets from Kachemak Bay and Attu Island are highly divergent and may represent cryptic subspecies or even species. However, both sample sizes and variabilities of these relatively slowly evolving genes were insufficient for assessing fine-scale differentiation. In FY97 we refined protocols for assaying variation in nine introns and three microsatellite loci in marbled murrelets, and screened samples from within the Spill area and neighboring sites. Results suggest that murrelets from the collection sites in the Aleutians differ genetically both from each other and from those in mainland North America (Congdon et al. submitted). In FY98, murrelets were screened for variation at one additional intron, but because of turnover in personnel, little other progress was made. In FY99 we are refining protocols for assaying sequence variation in the mitochondrial control region (mCR) and expanding our analyses to include murrelets from more distant sites, as well as birds from additional sites within the Spill area. Analyses of marbled and Kittlitz's murrelets should be essentially complete by the end of FY99; analyses of Kittlitz's murrelets are especially critical given the possibility of cryptic species.

Common Murres.-In FY97, we refined protocols for analyses of mCRs, microsatellites and introns in common murres, and screened samples for variation in the mCR and cytochrome b. In FY98 assayed samples for variation at five microsatellite loci and three introns. Preliminary analyses indicate that gene flow among colonies of common murres may be high (Patirana et al. in prep.), and that ~5% of murres from the Gulf of Alaska are hybrids or back-crosses between common and thick-billed murres. Simulations based on variation in three microsatellite loci among common murres from British Columbia, Washington, Oregon and California indicate that birds can be assigned to colonies with high confidence based on

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provide colony-specific markers that can be used to identify the origins of birds killed by the Spill. In FY99 we plan to complete our collections and analyses of DNA samples from common murres.

*Pigeon Guillemots.*-Previously, we surveyed variation in the mCR among populations of guillemots (*Cepphus* spp.) from throughout the Northern Hemisphere and found colony-specific sequence differences (Kidd and Friesen 1998). In FY97 we refined protocols for analysis of microsatellites and introns in guillemots, and in FY98 we continued tissue collections and assayed DNA samples for variation at one microsatellite locus and five introns. We plan to complete our collections and analyses of DNA samples from pigeon guillemots in FY99.

Because data collection is still in progress for all species, no restoration recommendations can be made at this point.

# NEED FOR THE PROJECT

# A. Statement of Problem

Alcids are highly vulnerable to marine oil pollution due both to the large amount of time they spend resting on the ocean surface, and to their dependence on marine fish and invertebrates for food. Many species of alcids suffered heavy mortality associated with the *Exxon Valdez* Spill; for example, the estimated mortality for common murres was in the hundreds of thousands. Although guillemots and murrelets were declining prior to the Spill, the accident probably increased their rate of decline. Common murres now appear to be recovering from the Spill, but pigeon guillemots and marbled murrelets apparently are not; the state of recovery of Kittlitz's murrelets is unknown. The reasons for the failure of these species to recover (as well as for the prespill declines) are unclear, but may be due to availability and quality of prey (currently being investigated through the APEX Predator Experiment and Nearshore Vertebrate Predator Project), and/or genetic problems such as genetic isolation of colonies or inbreeding. We are using state-of-the-art genetic techniques to aid in the restoration of these species.

# B. Rationale/Link to Restoration

Although the application of molecular methods to fisheries and wildlife management is common (e.g. Ryman and Utter 1987, Hansen and Loeschcke 1994, Allendorf and Waples 1996, Graves 1996), few if any studies have used genetic methods explicitly to aid in seabird conservation (Friesen 1997). Theoretically, measurement of genetic divergence and gene flow among populations of murres, murrelets and guillemots will aid restoration in the following three main ways:

Definition of the geographic limits of the affected populations.-Many seabirds killed by the Spill were migrating; thus, the 'affected' zone, or the populations that were affected by the Spill and require restoration effort, may be geographically different from the Spill zone. Genetic data should enable identification of breeding populations and thus the geographic limits of the populations of birds killed by the Spill. Furthermore, if colonies are essentially panmictic and/or constitute metapopulations, they should recover without assistance within a few generations. However, if colonies constitute numerous localized populations, they may not naturally recolonize sites affected by the Spill, and may require human assistance for recovery.

Identification of sources and sinks.-According to metapopulation theory, 'source' populations are populations that occur in optimal habitat and can act as net exporters of recruits for populations elsewhere; 'sink' populations occur in suboptimal habitat and require immigration to maintain numbers (Pulliam 1996). Genetic data can provide measurements of gene flow into and out of colonies, and thus can enable identification of sources and sinks. For example, protein data suggest that rock shags (*Stictocarbo magellanicus*) on the Falkland Islands may have served as the main source of breeders for other colonies in southern South America (Siegel-Causey 1997). If colonies affected by the Spill represent sources, then their restoration will be critical. If a colony represents a sink, its restoration may be a waste of resources and may actually prevent recovery of the total population.

*Environmental monitoring*.-Demographic parameters may be very different for genetically divergent populations, even if they occur in ecologically similar or geographically proximate areas. For example, common murres breeding in Washington have different breeding chronologies from those at neighboring colonies in British Columbia, and may be genetically different (K. Warheit et al. unpubl. data). Genetic data may enable identification of appropriate reference or control sites from which to obtain baseline data for monitoring, restoration and modelling, e.g. to determine if a seabird colony has recovered normal functioning.

Three other types of information that are useful for conservation and restoration are produced incidentally by genetic studies.

*Population uniqueness and cryptic species.*-A colony's uniqueness (e.g. its endemicity or genetic distinctiveness) may be used to priorize restoration efforts. Most importantly, genetic data enable the identification of 'cryptic' species - populations that are similar in appearance but that represent separate, non-interbreeding species (e.g. long-billed [*Brachyramphus perdix*] and marbled murrelets; Friesen et al. 1996a).

*Small effective population size and inbreeding.*-The longterm effective size of a population is the size of an idealized population that would have the same amount of genetic variation as the population being considered; the longterm effective size of a population may be one or two orders of magnitude lower than the census size due to such factors as unequal breeding success

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and population bottlenecks (Futuyma 1998). For example, the North Atlantic population of thick-billed murres consists of approximately 2.5 million breeding pairs (Nettleship and Evans 1985), but appears to have a long-term effective size of only ~15,000 females (Friesen et al. 1996b). Theoretically, as a population's effective size decreases, individual fitness declines due to increased inbreeding (Allendorf and Leary 1986, Gilpen and Soulé 1986). Furthermore, several researchers have argued that if effective population size declines below a certain critical level, the population may enter an extinction vortex in which inbreeding, deleterious alleles and stochastic effects combine synergistically to accelerate extinction (Gilpin and Soulé 1986). Application of a new body of theory known as Coalescence Theory to genetic information may be used to estimate longterm effective population size and to place confidence limits on these estimates (Beerli 1999 and references therein). Thus the extent to which small effective population sizes and inbreeding are preventing or slowing population recovery may be inferred.

*Translocations*.-If breeding success within a colony is low due to inbreeding depression, or if recruitment is low, transplantation of small numbers of individuals from other sites may be desirable. Ideally, sources of animals for such introductions should be neighboring colonies within the same population or a closely related population. Genetic data are important for determining which colonies are genetically appropriate sources to prevent both inbreeding (Allendorf and Leary 1986) and outbreeding depression (Templeton 1986).

### C. Location

This project requires collection of blood, feather and/or tissue samples from birds breeding thoughout the Pacific Basin, mostly in Alaska (Table 1). As much as possible, blood and blood feathers ('pin' or growing feathers) are being obtained from chicks or adults during banding through contributions from researchers working at specific sites. Birds being collected for ongoing diet studies in Alaska (J.F.P.) also are being used as a source of tissue. Sampling is being continued in FY99 to fill the 'holes' in Table 1; no further collections will be made in FY00.

Laboratory analyses are being undertaken in V.L.F.'s molecular laboratory at Queen's University. This laboratory is fully equipped for the assays described in the present proposal, and analyses of DNA variation in seabirds are routine; few other laboratories have the capability for assaying variation in mCRs, microsatellites *and* introns in seabirds. This laboratory receives additional technical and logistical support from the Queen's University Molecular Ecology Lab (run by Dr. Peter Boag), and the Queen's University Core Facility.

# **COMMUNITY INVOLVEMENT**

The bulk of work involved in the proposed project must be conducted by highly trained personnel in a specially equipped research laboratory. We will attempt to obtain tissue samples from seabirds harvested for subsistence purposes when possible. Sample collections may require chartering local vessels and paying for assistance from local experts, hunters or vessel

operators (see **Methods**). Information about the age of colonies, which is needed for interpretation of genetic results, will be sought from traditional knowledge. Project results will be communicated to local residents through popular reports in the Trustee Council newsletter when available.

# **PROJECT DESIGN**

## A. Objectives

The primary purpose of this project is to conduct a genetic analyses to aid in the restoration of common murres, pigeon guillemots, and marbled and Kittlitz's murrelets to areas affect by the Spill. We have three main objectives for each species:

- 1) To determine the geographic extent of the populations affected by the Spill.
- 2) To identify source and sink colonies.
- 3) To identify appropriate reference or 'control' sites for monitoring.

As incidental results, we should also be able

- 4) To identify cryptic species or subspecies.
- 5) To measure coefficients of inbreeding and effective population sizes.
- 6) To identify appropriate source populations for translocations, if necessary.

## B. Methods

We are comparing DNA sequence variation in two mitochondrial genes, 6-8 microsatellite loci and 8-10 nuclear introns among approximately 30 birds from each of 12-15 colonies each for common murres, marbled murrelets and pigeon guillemots, and as many individuals as possible for Kittlitz's murrelets (Table 1). For each species, we are testing the null hypothesis that colonies are panmictic (i.e. genetic structure is essentially absent) against the alternative hypothesis that significant genetic differences exist among birds from different colonies.

Sampling.-To obtain reliable estimates of genetic differentiation and gene flow within and between the Spill area and neighboring areas, as well as to define the geographic limits of the populations affected by the Spill, we are sampling 4-6 colonies of each species from the Spill area, as well as 4-6 colonies each west and east of the Spill area. A minimum of 30 samples are required from each site for each species for reliable estimation of genetic variation within

and among sites (Richardson et al. 1986, Weir 1996). Many of the necessary baseline samples were obtained opportunistically during previous research projects through the assistance of Vernon Byrd and Dave Roseneau (Alaska Maritime National Wildlife Refuge), Jay Pitocchelli, Tom van Pelt and Lindsey Hayes (U.S. Geological Survey, Anchorage), Alex Pritchard (University of Alaska), Jan Hodder (Oregon Institute of Marine Biology) and Kathy Martin (Canadian Wildlife Service). Other samples were available from tissue collections at the University of Alaska Museum and the Burke Museum (University of Washington), or were collected for dietary analyses in previous years by J.F.P. and his coworkers. Most samples are already in hand; the remainder are being obtained during FY99. Samples from birds killed by the Spill also are being obtained from the Burke Museum and will be screened for marker loci to determine their colony of origin.

Loci.-Much of southern Alaska was ice-covered during the Pleistocene glaciations, so most seabird colonies from the Spill area were probably only populated within the last ~10,000 years. Measurement of gene flow and genetic divergence among colonies of these birds therefore requires analysis of loci with high mutation rates. MtDNA has proven useful for studies of such species since it has a relatively high mutation rate and is more sensitive to population bottlenecks and restricted gene flow than are nuclear loci (Wilson et al. 1985, Avise 1994, Avise and Hamrick 1996, Mindell 1997). The mCR is especially useful for analyzing recent evolutionary events since it has a mutation rate 5-10x higher than the mean for mtDNA (Brown et al. 1986, Avise 1994, Avise and Hamrick 1996, Baker and Marshall 1997). Analysis of the mitochondrial cytochrome b gene also is useful for estimating population genetic structure and longterm effective population sizes in alcids since its mutation rate has been calibrated for this family (Friesen et al., unpubl.). However, mtDNA represents a single supergene whose pattern of inheritance is not typical of the rest of the genome (Wilson et al. 1985); results of analyses of mtDNA therefore need to be confirmed with analyses of nuclear loci. Microsatellite loci have mutation rates higher than those of mtDNA so are being used increasingly for evolutionary studies (Avise 1994, Dowling et al. 1996, McDonald and Potts 1997). However, depending on the age and size of populations, microsatellite loci may contain high levels of homoplasies (back-, parallel and convergent mutations), which may result in inaccurate estimates of genetic differentiation and gene flow. Nuclear introns have variabilities equivalent to those of mtDNA (Congdon et al. submitted), so also are useful for studying recent evolutionary events (Friesen et al. 1996; Holder et al., in press; Congdon et al. submitted). Because microsatellites and introns are nuclear loci, they are less sensitive to population bottlenecks and restricted gene flow than are mitochondrial genes; Moore (1995) estimated that, due to the larger effective population size of nuclear genes, 8-16 nuclear loci are required to obtain information equivalent to that of one mitochondrial gene. Previous researchers (e.g. Richardson et al. 1986, Weir 1996) have also suggested that information from at least five to six nuclear loci are required to obtain reliable estimates (i.e. to derive robust error estimates) of genetic structure and gene flow. Thus we are analyzing the mCR and cytochrome b gene, as well as 8-16 nuclear loci, with the specific number of each class of marker depending on observed levels of variability.

Laboratory Assays.-Variation in number of repeating units in microsatellite loci is being assayed using standard protocols (Dowling et al. 1996). To reduce time and cost associated with assaying sequence variation in mitochondrial genes and introns, a two-step procedure is being used. Samples first are screened for mutations using analysis of single-stranded conformational polymorphisms (SSCPs; Friesen et al. 1996a, 1997). The exact nature of mutations then is determined by direct sequence analysis of at least one individual with each genotype detected from SSCPs. Previous experience indicates that this combination of techniques provides an efficient and sensitive method for comparing sequence variation among populations (Friesen et al. 1996a, 1997, Congdon et al. submitted). We estimate that these analyses will be completed by the end of FY99.

Statistical Analyses.-Data are being analyzed using standard methods developed for analysis of data from protein electrophoresis and sequencing (e.g. Swofford & Selander 1981; Swofford 1993), as well as a few new techniques that capitalize on the power of combining genotypic and sequence data (e.g. Michalakis and Excoffier 1996, Beerli 1999):

- 1) To determine the geographic limits of populations affected by the Spill, the extent of genetic differentiation of colonies will be calculated using Wright's F statistics and its analogues (e.g.  $\phi_{st}$ ) and tested for significance using randomization procedures (e.g. Excoffier et al. 1992).
- 2) To identify source and sink colonies, the direction and magnitude of gene flow (including confidence limits) among colonies is being estimated using coalescence theory (Slatkin and Maddison 1989, Beerli 1999).
- 3) Appropriate reference or 'control' sites for monitoring, will be apparent from the results of objective (1); colony-specific markers (in the form of allele frequency differences at multiple loci) for impact assessment will be determined using SPAM (ADFG 1999) and Assign (M. Damus, unpubl. program)
- 4) Cryptic species will be inferred from (i) fixed allele differences, which indicate prolonged genetic isolation of populations, (ii) paraphyletic relationships among populations from different species, and/or (iii) high sequence divergences between the mitochondrial genomes of individuals from different populations.
- 5) Coefficients of inbreeding will be estimated from nuclear data using Wright's F statistics, and longterm effective population sizes (including confidence limits) will be estimated from mitochondrial sequence data using the method of Beerli (1999), which is based on Coalescence Theory.
- 6) Appropriate source populations for translocations will be apparent from the results of objective (1).

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Alternative Methodologies.-Although gene flow and population genetic structure can be approximated from demographics (e.g. Rockwell and Barrowclough 1987), generation of these data involves longterm banding studies and is extremely labour-intensive, especially for species such as marbled and Kittlitz's murrelets with secretive nesting habits. Furthermore, estimates of genetic divergence from demographic data tend to miss occasional mass migrations, which may be important sources of gene flow in seabirds (e.g. Nettleship and Evans 1985). Traditional molecular methods such as protein electrophoresis also are not usually suitable for measuring genetic subdivision in populations either in birds or in species that breed at high latitudes due to low levels of variability (Evans 1987). Although DNA fingerprinting can reveal high levels of variability, it is expensive, laborious and time-consuming, and exhibits levels of homoplasy (genetic 'noise') too high for comparisons of populations. Finally, analysis of randomly amplified polymorphic DNA (RAPDs) requires high quality DNA, which is not available for many of our samples (e.g. murrelet stomachs preserved in ethanol from Washington); furthermore, many traditional methods of assessing genetic structure and gene flow cannot be applied to RAPD data either because of null alleles or because the exact nature of variation is not known. The approach outlined in the present proposal combines the strengths of classical protein electrophoresis with direct sequence analysis, and provides a powerful method for studies evolutionary genetics and conservation (e.g. Friesen et al. 1997. Congdon et al. submitted).

## C. Cooperating Agencies, Contracts, and Other Agency Assistance

Collections of blood and tissue were coordinated with other agencies (museums, wildlife agencies, etc.) by V.L.F. and J.F.P. Collections of seabirds for diet studies and genetic samples were coordinated with the USFWS, Alaska Maritime National Wildlife Refuge. No additional contracts or cooperating agencies are required to complete this project.

#### **SCHEDULE**

#### A. Measurable Project Tasks for FY00

Jan. 1 '00 - Feb. 29 '00:	Technician collates data for common murres, double-checks
	genotype scores and sequences, and analyzes data using
	Winamova, Migrate, Spam, etc.
Jan. '00:	PIs attend Annual Restoration Workshop
Mar. 1 '00 - Apr. 30 '00:	Technician collates data for murrelets, double-checks genotype scores and sequences, and analyzes data using Winamova,
	Migrate, Spam, etc.
May 1 '00 - Jun. 30 '00:	Technician collates data for guillemots, double-checks genotype scores and sequences, and analyzes data using Winamova,
	Migrate, Spam, etc.

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May 1 '00 - Jun. 30 '00:	V.L.F. prepares manuscript based on results for common murres
Jul. '00:	V.L.F. and/or J.F.P. present interim results at conferences
Jul. 1 '00 - Aug. 31 '00: murrelets	V.L.F. prepares manuscript based on results for marbled
Sep. 1 '00 - Oct. 31 '00:	V.L.F. prepares manuscript based on results for guillemots
Nov. 1 '00 - Dec. 31 '00:	V.L.F. prepares manuscript based on results for Kittlitz's murrelets, as well as final report
Apr. 15 '01:	V.L.F. submits final report

# B. Project Milestones and Endpoints

Jan. '97:	PIs attend Annual Restoration Workshop
Mar. 31 '97:	Technicians complete development of microsatellite protocols for
	guillemots, and refine protocols for analysis of introns and
	control regions for each species as necessary
Aug. 31 '97:	Field collections for FY97 completed
Dec. 31 '97:	Technicians complete screening of samples available up to and
	including FY97 for variation in the mitochondrial control region,
	eight microsatellite loci and ten introns
Jan. '98:	PIs attend Annual Restoration Workshop
Apr. 15 '98:	V.L.F. completes annual report for FY97
Aug. 31 '98:	Field collections for FY98 completed
Dec. 31 '98:	Technicians complete screening of samples collected in FY98
Mar. '99:	PIs attend Annual Restoration Workshop
Apr. 15 '99:	V.L.F. completes annual report for FY98
Aug. 31 '99:	Field collections for FY99 completed
Dec. 31 '99:	Technicians complete screening of samples collected in FY99
Jan. '00:	PIs attend Annual Restoration Workshop
Apr. 15 '00:	V.L.F. completes annual report for FY99
Jun. 30 '00:	V.L.F. and technicians complete data analysis (including all
	analyses outlined in Objectives) and manuscripts
Jul. '00:	V.L.F. reports results of studies at conferences
Apr. 15 '01:	V.L.F. submits final report

## C. Completion Date

Data collection and analysis will be completed for all species by the end of 1999; final reports and manuscripts summarizing results of the completed projects for each species will be prepared during FY00.

## **PUBLICATIONS AND REPORTS**

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Four major publications will be prepared for publication following completion of the project in FY00; each will report estimates of genetic variability, genetic structure and gene flow for one target species. These papers will form the basis for the final report, and will be submitted to international peer-reviewed journals such as *Evolution*, *Molecular Ecology*, or *Auk*, as well as to managers involved with restoration.

## **PROFESSIONAL CONFERENCES**

Final results of the project will be presented as contributed papers by the principal investigators at the annual meetings of the Society for Conservation Biology, the Society for the Study of Evolution and/or the American Ornithological Union in 2000 (locations and dates to be announced).

## NORMAL AGENCY MANAGEMENT

Not applicable.

# COORDINATION AND INTEGRATION OF RESTORATION EFFORT.

Collection of samples are being coordinated with ongoing studies of seabird feeding ecology in Alaska conducted by the Alaska Biological Science Center, USGS (J.F.P.) and the U.S. Fish and Wildlife Service (Alaska Maritime National Wildlife Refuge). Tissues and skeletons obtained from seabirds are being archived at the American Museum of Natural History (New York), and tissues also are being collected for use in ongoing studies of seabird trophic relationships using stable isotope ratios (K. Hobson, Canadian Wildlife Service, Saskatoon). Samples from carcasses salvaged from the Spill are being obtained from the Burke Museum. This project is made possible by previous contracts awarded to V.L.F. and Dr. Tim Birt by the Environmental Innovations Program of Public Works and Government Services Canada and the Lindbergh Foundation, which enabled the development of primers and protocols for 30 nuclear introns. The present project also is made possible through the donation of tissue samples from murres, murrelets and guillemots by field researchers in Canada and the United States (see Methods - *Population surveys*); these samples are worth an estimated \$12,500.

# **EXPLANATION OF CHANGES IN CONTINUING PROJECTS**

The slight increase in the budget over the costs projected in FY99 results from a cost for general administration and miscellaneous charges (Xeroxing, telephone calls, printer cartridges) overlooked in the budgets in previous years. Two technicians listed in the previous

proposal were replaced (see Personnel). Otherwise, the present proposal does not differ from that approved in FY99.

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# PROPOSED PRINCIPAL INVESTIGATORS.

## PLEASE NOTE CHANGE IN FAX AND PHONE NUMBERS FOR V.L.F.

Name	Dr. Vicki L. Friesen
Affiliation	Queen's University
Mailing address	Department of Biology, Kingston, Ontario K7L 3N6, Canada
Phone number	613-533-6156
Fax number	613-533-6617
E-mail address	friesenv@biology.queensu.ca
Name	Dr. John F. Piatt
Affiliation	Alaska Biological Sciences Center, USGS
Mailing address	1011 East Tudor Road, Anchorage, AK 99503
Phone number	907-786-3549
	201 100 22 12
Fax number	907-786-3636
Fax number E-mail address	907-786-3636 john_piatt@nbs.gov

## PRINCIPAL INVESTIGATORS

Principal investigator - Dr. Vicki Friesen (Assistant Professor of Biology, Queen's University, Kingston, Ontario) completed undergraduate and graduate work in 1992 on the ecology and genetics of seabirds in the North Atlantic. Her doctoral project involved a molecular study of population differentiation and evolution in common and thick-billed murres. She is an author on 27 publications in peer-reviewed scientific journals, including papers on behavioral ecology, genetics and evolution of various vertebrates, primarily seabirds. On-going projects in her research lab include population genetic and phylogenetic studies of murres, murrelets, guillemots, auklets, shags, storm-petrels, ptarmigan, parrots and warblers. She will be responsible for supervising the laboratory component of the project, and writing interim and final reports and manuscripts for publication. Her curriculum vitae is appended.

Principal investigator - Dr. John F. Piatt (Research Biologist GS-13, Alaska Biological Sciences Center, USGS, Anchorage, AK) obtained a Ph.D. in Marine Biology from Memorial University of Newfoundland in 1987. His dissertation involved seabird-forage fish interactions. Since 1987, he has studied seabirds both at colonies and at sea in the Gulf of Alaska, Aleutian Islands, and Bering and Chukchi seas. His is an author on over 50 peer-reviewed scientific publications about seabirds, fish, marine mammals, and effects of oil pollution on marine birds. He will act as the liaison between V.L.F., the *EVOS* Trustees and other agencies in Alaska, coordinate collection of samples, and assist with writing of reports and manuscripts for publication.

## **OTHER KEY PERSONNEL**

Post-doctoral Fellow (full time) - Dr. Tim Birt received his PhD from Memorial University of Newfoundland in 1990. His thesis involved a genetic comparison of landlocked and sea-run Atlantic salmon (*Salmo salar*) from Newfoundland, and included analysis of proteins and mitochondrial DNA as well as rearing and physiological experiments. He also spent three years as a post-doctoral fellow at the Royal Ontario Museum in Toronto, where he used molecular techniques to study the phylogenetic relationships among scolopacid shorebirds, and population genetic structure of caribou. He was hired on Jan. 15 1998 and is responsible for genetic analyses of common murres

Technician I (full time) - Ms. Gabriela Ibarguchi received her M.Sc. in biology from Queen's University. Her M.Sc. thesis involved an analysis of kin groups and population structure within a colony of thick-billed murres. She has all the molecular skills required by this project, and was hired full-time on Jan. 25 1999 to complete the genetic assays of guillemots. She also is responsible for management duties necessary for successful completion of the project (e.g. ordering supplies, maintaining radioisotope records, preparing DNA extractions, etc).

Technician II (half-time) - Mr. Graeme Gissing received his B.Sc. and M.Sc. from Guelph
University. His thesis involved a study of extra-pair paternity in American goldfinches. He has most of the molecular skills required by this project, and is quickly learning the rest. He is responsible for completing the genetic assays of murrelets.

#### LITERATURE CITED

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Site	Avail-	Needed	
COMMON MURRE			
California (Farallon Islands)	30	0	
Washington (Clallam)	30	0	
N. Vancouver Island	40	0	
Southeastern Alaska	0	30	
Prince William Sound (Cordova)	23	7	
Middleton Island	0	30	
Central Cook Inlet (Kachemak Bay, Chisik I.)	48	0	
Lower Cook Inlet (Barren Is.)	27	3	
Central Alaska Peninsula (Semidi Is.)	24	6	
Western Alaska Peninsula (Midun, Koniuji Is.)	18	12	
Eastern Aleutians (Aiktak I.)	28	2	
Western Aleutians (Attu, Agattu & Buldir Is.)	27	3	
Bering Sea (Pribilof, St. Matthew, St. Lawrence Is.)	30	0	
Chukchi Sea (Capes Lisburne & Thompson)	33	0	
Sea of Okhotsk (Talan I., Magadanskaya)	30	0	
Japan (Teuri I.)	0	30	
λαρργαν Μεπρεερτ			
MARBLED MORRELEI	40	0	
California	40	10	
Washington	12	10	
Washington	10	12	
Southoostom Alaska (Longourier L)	30	10	
Southeastern Alaska (Lenesurier I.)	20	10	
Casha Jalat (Kashamala Dari)	20	10	
Cook Iniet (Kachemak Bay)	24	0	
Kodiak Island	20	4	
Mitrorania Bay	20	4	
Shumagin Islands (Komuji Is., Berkorski B., Takutat P.)	22 12	Ŏ 10	
Control Aloutions (Adds I)	12	01 00	
Unital Alculatis (Adak I.)	10	20	
western Aleunans (Autu I.)	10	12	

Table 1. Sites, numbers of samples available, and numbers of samples needed for genetic analyses of murres, murrelets and guillemots.

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Table 1, cont'd.

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Site	Avail- able	Needed
KITTLITZ'S MURRELET		
Prince William Sound	4	*
Kachemak Bay	18	*
Adak Island	6	*
Western Aleutians (Attu I.)	5	*
Bering Strait	*	*
PIGEON GUILLEMOT		
California (Farallon Is.)	20	10
Oregon	25	5
British Columbia (Queen Charlotte Is.)	30	0
Southeast Alaska (Glacier Bay)	0	30
Prince William Sound (Jackpot & Naked Is.)	30	0
Cook Inlet (Kachemak Bay)	9	21
Kodiak Island	0	30
Alaska Peninsula (Semidi, Shumagin, Tanakiak Is.)	17	13
Western Aleutians (Attu, Agattu Is.)	0	30
Kuril Is.	0	30
Bering Sea (Pribilof, St. Lawrence Is.)	0	30
Chukchi Sea (Capes Thompson and Lisburne)	0	30

\*Samples will be obtained from Kittlitz's murrelets opportunistically.

**NOTE:** Every effort is made to obtain samples non-destructively to minimize the need for collections, e.g. as feathers or blood samples collected during banding, or from museum specimens.

2000 EXXON VALDEZ TRUSTEL -- JNCIL PROJECT BUDGET

October 1, 1999 - September 30, 2000

l	Authorized	Proposed			
Budget Category:	FY 1999	FY 2000			
Personnel		\$0.0			
Travel		\$0.0			
Contractual		\$17.9			
Commodities		\$0.0			· · · · · · · · · · · · · · · · · · ·
Equipment		\$0.0	LONG RANGE FUN	DING REQUIREMEN	TS
Subtotal	\$0.0	\$17.9	Estimat	ed Estimated	
General Administration		\$1.3	FY 200	FY 2002	
Project Total	\$0,0	\$19.2		0.0 \$0.0	
				~	
Full-time Equivalents (FTE)		0.0			
			Dollar amounts are shown in thousands o	dollars.	
Other Resources					
Comments:					
The slight increase in the budget ove	r the costs project	ted in FY99 resu	s from a cost for general administration,	age charges and m	iscellaneous
charges (Xeroxing, telephone calls, p	rinter cartridges)	overlooked in th	budgets in previous years. Otherwise, the	present proposal do	es not differ from
that approved in FY99.				· · ·	
					ang
[]	Due to at Nix and				EODM 24
	Project Nume	ber: 00-169			FORIVI SA
FVOO	Project Title:	A genetic stu	/ to aid in the restoration of murres	, guillemots	TRUSTEE
FIOO	and murrelets	s to the Gulf o	Alaska		AGENCY
	Agency: DOL				SUMMARY
Broparod: 12 April 1999					
Frepareu: 12 April 1999			annaa <u>aa aa </u>		

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### 2000 EXXON VALDEZ TRUSTEL SUJNCIL PROJECT BUDGET

October 1, 1999 - September 30, 2000

Personnel Costs:		GS/Range/	Months	Monthly		Proposed
Name	Position Description	Step	Budgeted	Costs	Overtime	FY 2000
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
~						0.0
						0.0
				· ·		0.0
						0.0
	Subtotal		0.0	0.0	0.0	
				P	ersonnel Total	\$0.0
Travel Costs:		Ticket	Round	Total	Daily	Proposed
Description		Price	Trips	Days	Per Diem	FY 2000
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
					Travel Total	\$0.0
				1		
	Project Number: 00-169					FORM 3B
EVOO	Project Title: A genetic study to aid in th	e restoration	of murres, gui	llemots	F	Personnel
	and murrelets to the Gulf of Alaska					& Travel
	Agency' DOI					DETAIL
Prepared:12 April 1999					L	

Prepared:12 April 1999

### 2000 EXXON VALDEZ TRUSTEL COUNCIL PROJECT BUDGET

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October 1, 1999 · September 30, 2000

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Contractual Costs:		Proposed
Description		FY 2000
4A Linkage		17.9
When a non-trustee organization is used, the form 4A is required.	Total	\$17.9
Commodities Costs:		Proposed
Commodities	Total	\$0.0
FY00 Project Number: 00.169   Project Title: A genetic study to aid in the restoration of murres, guillemots and murrelets to the Gulf of Alaska   Agency: DOI	F Cor Cor	ORM 3B htractual & mmodities DETAIL

Prepared:12 April 1999

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#### 2000 EXXON VALDEZ TRUSTEL .... NCIL PROJECT BUDGET

October 1, 1999 - September 30, 2000

New Equipment Purchases:		Number	Unit	Proposed
Description		of Units	Price	FY 2000
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
		~		0.0
				0.0
				0.0
Those purchases associated with repla	acement equipment should be indicated by placement of an R.	New Eq	uipment Total	\$0.0
Existing Equipment Usage:			Number	Inventory
Description			of Units	Agency
		·		
L		<u> </u>	······································	
	Project Number: 00-169		F	
	Project Title: A genetic study to aid in the restoration of murres. gu	illemots	, 	quinment
	and murrelets to the Gulf of Alaska			DETAIL
				DETAIL
			L	

Prepared:12 April 1999

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# 2000 EXXON VALDEZ TRUSTEE ..... NCIL PROJECT BUDGET October 1, 1999 - September 30, 2000

	Authorized	Proposed		
Budget Category:	FY 1999	FY 2000		
Personnel		¢12.0		
Travel		\$13.6 \$1.5		
Contractual		0.02		
Commodities		\$1.0		.
Equipment		\$0.0	LONG RANGE FUNDING REQUIREMENTS	
Subtotal	\$0.0	\$16.3	Estimated Estimated	
Indirect		\$1.6	FY 2001 FY 2002	
Project Total	\$0.0	\$17.9		
Full-time Equivalents (FTE)		. 0.5		
			Dollar amounts are shown in thousands of dollars.	
Other Resources				
FY00 Prepared:12 April 1999	Project Numl Project Title: and murrelet Agency: DOI	per: 00-169 A genetic stu s to the Gulf o	Idy to aid in the restoration of murres, guillemots of Alaska SUMMAI	A tee २Y

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## 2000 EXXON VALDEZ TRUSTEE COUNCIL PROJECT BUDGET October 1, 1999 - September 30, 2000

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Pers	onnel Costs:			Months	Monthly		Proposed
	Name	Position Description		Budgeted	Costs	Overtime	FY 2000
	Dr. Tim Birt	Research Associate		6.0	2.3		13.8
						-	0.0
							0.0
1							0.0
							0.0
						!	0.0
							0.0
ĺ	é						0.0
							0.0
					×		0.0
							0.0
<u> </u>				· · · · ·		0.0	0.0
		Sublota		0.0	2.3 	0.0 ersonnel Total	\$13.8
Trav	el Costs:		Ticket	Round	Total	Daily	Proposed
<u> </u>	Description	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	Price	Trips	Davs	Per Diem	FY 2000
	Travel to EVOS 2000 workshop	for VLF	1.0	1	5	0.1	1.5
							0.0
							0.0
							0.0
H							0.0
							0.0
							0.0
							0.0
							0.0
ľ							0.0
							0.0
	l	· · · · · · · · · · · · · · · · · · ·				Travel Total	0.0
<u> </u>							φ1.Ο
·		Project Numbers 00 160					FORM 4B
		Project Number: 00-109		- <b>f</b>			Personnol
	FY00	Project litle: A genetic study to aid in tr	ne restoration	of murres,		1	
		guillemots and murrelets to the Gulf of A	Alaska			}	& Iravei
		Agency: DOI					DETAIL

Prepared:

2000 EXXON VALDEZ TRUSTEE COUNCIL PROJECT BUDGET October 1, 1999 · September 30, 2000

Contractual Costs:			Proposed
Description			FY 2000
		Contractual Total	\$0.0
Commodities Costs:			Proposed
Description			FY 2000
Miscellaneous (xeroxing, phone o	calls, toner, etc.)		0.5
		Commodities Total	\$1.0
FY00 Prepared:12 April 1999	Project Number: 00.169 Project Title: A genetic study to aid in the restoration of murres, guillemots and murrelets to the Gulf of Alaska Agency: DOI	F Con Cor	ORM 4B tractual & nmodities DETAIL

# 2000 EXXON VALDEZ TRUSTEE COUNCIL PROJECT BUDGET

October 1, 1999 - September 30, 2000

New Equipment Purchases:		Number	Unit	Proposed
Description		of Units	Price	FY 2000
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
				. 0.0
Those purchases associated with	replacement equipment should be indicated by placement of an R.	New Equ	uipment Total	\$0.0
Existing Equipment Usage:			Number	
Description			of Units	
	Project Number: 00-169			ORM 4B
FYOO	Project Number: 00-169 Project Title: A genetic study to aid in the restoration of murres,		F	ORM 4B quipment
FY00	Project Number: 00-169 Project Title: A genetic study to aid in the restoration of murres, guillemots and murrelets to the Gulf of Alaska		F	ORM 4B quipment DETAIL
FYOO	Project Number: 00-169 Project Title: A genetic study to aid in the restoration of murres, guillemots and murrelets to the Gulf of Alaska Agency: DOI		F	ORM 4B quipment DETAIL

Prepared:12 April 1999