



United States Department of the Interior

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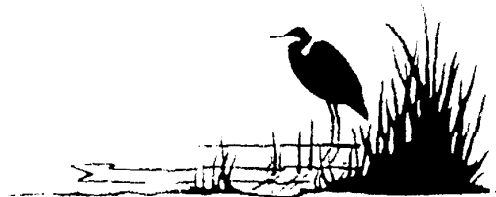
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Message SHEARWATERS ESTIMATES.

REVISED CREDIT SECTION

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Credit

The credit calculation parallels the injury calculation. One restoration proposal is to remove non-indigenous predators (rats, cats, owls, etc.) from Shearwater nesting colonies. PRBO estimates that 2.5 percent of mortality is attributable to such predation. They found that owl/cat predation was most destructive to 4 and 5 year-olds. Column 2 of Table 4 shows the rate of extra survival by age. Table 4 works out the number of discounted bird years saved by one year of a predator control program directed at a colony of 100 birds. Column 3 shows the number of birds that do not become prey. Column 4 shows the number of bird-years expected from their survival by multiplying by their expected lifetime with later years discounted at 3 percent. Column 5 estimates the number of progeny saved by multiplying the expected breeding years of each age class times the number surviving and the expected fledging rate. Column 6 converts the added progeny surviving to bird-years by multiplying by the discounted expected life time of new fledglings. Keep in mind this table shows one year's population by age (unlike Table 3 in the Red-footed Booby credit estimates which showed one year class through time). As fledglings will provide bird services far into the future their bird years must be discounted by dividing age by a discount factor.

The final column shows the number of bird-years saved by age-class. The total, 177 credit bird-years, may be compared to the 46,932 or 114,723 bird-years lost. The credit may be scaled up directly by size of colony for a single year program but future years would need to be discounted for a multi-year program. That is, protection of a 500 bird colony for one year would generate a credit of 885 bird-years but a 5 year program of a 100 bird colony would generate only 810 bird-years. A 10 year program at a 3,100 bird colony would approximately equal 46,900 bird-years due.

Table 4. Tesoro Compensation from Shearwater Predator Control Measures
Per 100 birds in project population for one year

Age	Excess Mortality from Predation	Added Survival	Bird-years from Survivors	Number of Progeny Saved	Saved Progeny Bird-Years	Saved Bird-Years
1	0.00	0.00	0	0.00	0	0
2	0.05	2.55	14	2.10	11	25
3	0.05	2.27	12	2.26	12	24
4	0.10	4.11	22	4.81	25	47
5	0.10	3.72	20	4.99	25	45
6	0.01	0.34	2	0.51	3	4
7	0.01	0.30	2	0.45	2	4
8	0.01	0.28	1	0.40	2	3
9	0.01	0.25	1	0.36	2	3
10	0.01	0.23	1	0.32	2	3
11	0.01	0.20	1	0.28	1	2
12	0.01	0.18	1	0.25	1	2
13	0.01	0.17	1	0.22	1	2
14	0.01	0.15	1	0.19	1	2
15	0.01	0.14	1	0.17	1	2
16	0.01	0.12	1	0.15	1	1
17	0.01	0.11	1	0.13	1	1
18	0.01	0.10	0	0.11	1	1
19	0.01	0.09	0	0.10	1	1
20	0.01	0.08	0	0.09	0	1
21	0.01	0.08	0	0.07	0	1
22	0.01	0.07	0	0.06	0	1
23	0.01	0.06	0	0.05	0	0
24	0.01	0.06	0	0.04	0	0
25	0.01	0.05	0	0.04	0	0
26	0.01	0.05	0	0.03	0	0
27	0.01	0.04	0	0.03	0	0
28	0.01	0.04	0	0.02	0	0
29	0.01	0.03	0	0.02	0	0
30	0.01	0.03	0	0.01	0	0
31	0.01	0.03	0	0.01	0	0
32	0.01	0.03	0	0.01	0	0
33	0.01	0.02	0	0.00	0	0
34	0.01	0.02	0	0.00	0	0
35	0.01	0.01	0	0.00	0	0
36	0.01	0.00	0	0.00	0	0
		16	84	18	93	177