# PART I - ADMINISTRATIVE

## Section 1. General administrative information

**Title of project**

Avian Predation On Juvenile Salmonids In The Lower Columbia River

**BPA project number:** 9702400
**Contract renewal date (mm/yyyy):** 1/1999 ☐ **Multiple actions?**

**Business name of agency, institution or organization requesting funding**
Oregon State University/Columbia River Inter-Tribal Fish Commission

**Business acronym (if appropriate)** OSU/CRITFC

**Proposal contact person or principal investigator:**


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| **Name** | Dr. Daniel D. Roby |
| **Mailing Address** | OCFWRU, 104 Nash Hall, Oregon State University |
| **City, ST Zip** | Corvallis, OR 97331-3803 |
| **Phone** | (541) 737-1955 |
| **Fax** | (541) 737-3590 |
| **Email address** | robyd@ucs.orst.edu |


**NPPC Program Measure Number(s) which this project addresses**
5.7A.6, 5.7B.20, 5.7B.21, 5.7B.22, 5.7B.23

**FWS/NMFS Biological Opinion Number(s) which this project addresses**
1995 NMFS Hydrosystem Operations Biological Opinion: VII.A.14, XII.8, XII.9

**Other planning document references**
NMFS Snake River Recovery Plan: V.2.8.a.2, V.2.8.b.1; Wy Kan Ush Me Kush Wit: 5.B.Hypothesis 6; Lower Columbia Steelhead Conservation Initiative; Steelhead Supplement to the Oregon Plan; Oregon Department of Fish and Wildlife Draft Predation Action Plan: Avian Species

**Short description**
Monitor and evaluate the efficacy of management initiatives to reduce predation by colonial waterbirds on juvenile salmonids in the lower Columbia River. Assist resource managers in the development of a long-term avian predation management plan.

**Target species**
Columbia Basin salmonids, Caspian terns, double-crested cormorants, gull spp.

## Section 2. Sorting and evaluation

**Subbasin**
Mainstem, Ocean/estuary

### *Evaluation Process Sort*

| CBFWA caucus | Special evaluation process | ISRP project type |
|---|---|---|
| Mark one or more caucus | If your project fits either of these processes, mark one or both | Mark one or more categories |
| ☒ Anadromous fish<br>☐ Resident fish<br>☐ Wildlife | ☐ Multi-year (milestone-based evaluation)<br>☐ Watershed project evaluation | ☐ Watershed councils/model watersheds<br>☐ Information dissemination<br>☐ Operation & maintenance<br>☐ New construction<br>☒ Research & monitoring<br>☐ Implementation & management<br>☐ Wildlife habitat acquisitions |

## Section 3. Relationships to other Bonneville projects

***Umbrella / sub-proposal relationships.*** List umbrella project first.

| Project # | Project title/description |
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### *Other dependent or critically-related projects*

| Project # | Project title/description | Nature of relationship |
|---|---|---|
| 9008000 | Columbia Basin PIT Tag Information System | Recovery of PIT tag codes from piscivorous waterbird colonies to be included in the PTAGIS database |
| 9600800 | PATH | Estimates of smolt losses to birds can be included in mainstem passage models to estimate juvenile salmonid survival |
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## Section 4. Objectives, tasks and schedules

### *Past accomplishments*

| Year | Accomplishment | Met biological objectives? |
|---|---|---|
| 1996 | Identify the locations and population size of major piscivorous waterbird colonies on the lower Columbia River | Nine colonies were identified and the population size of each colony was estimated using aerial photography. |
| 1996 | Recover PIT tags from the Rice Island Caspian tern colony in the Columbia River Estuary | Roughly 400 tags were recovered. These data were analyzed along with tag recoveries in 1997 to estimate the total number of tags on the colony site, as well as the relative vulnerability of different salmonid species and rearing types to tern predation. |
| 1997 | Determine the population size and trajectory of nine piscivorous waterbird colonies on the lower Columbia River. | Population size was determined using aerial photography and comparisons to previous census information indicated that most colonies were increasing in size. |
| 1997 | Determine the diet composition of nine piscivorous waterbird colonies on the lower Columbia River. | Juvenile salmonids were an important part of the diet of some piscivorous waterbirds nesting in the estuary, most notably the Rice Island Caspian tern colony. Gulls nesting at upriver locations were far less reliant on juvenile salmonids as a food source. |
| 1997 | Recover PIT tags from the Rice Island Caspian tern colony in the Columbia River Estuary | Roughly 600 tags were recovered. These data were analyzed along with tag recoveries in 1996 to estimate the total number of tags on the colony site, as well as the relative vulnerability of different salmonid species and rearing types to tern predation. |
| 1997 | Use a bioenergetics approach to estimate the total number of juvenile salmonids consumed by the Rice Island Caspian tern colony. | Bioenergetics estimates indicated that Caspian terns consumed between 6 and 25 million juvenile salmonids in 1997. |
| 1998 | Verify estimates of predation on juvenile salmonids by Caspian terns nesting on Rice Island. | Estimates of predation in 1998 were similar to 1997, suggesting that 1997 was not an anomalous year. These data are currently being analyzed. |

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| 1998 | Use a bioenergetics approach to estimate the total number of juvenile salmonids consumed by double-crested cormorants nesting in the Columbia River Estuary. | Model input variables were measured to estimate cormorant consumption on juvenile salmonids in 1998. These data are currently being analyzed. |
| 1998 | Collect information on the distribution, foraging range, and habitat utilization of Caspian terns in the Columbia River Estuary. | Road-based and aerial surveys were conducted. Most terns were observed within 5 miles of the colony location. Terns were commonly observed foraging near pile dikes and hatchery release locations in the estuary. These data are currently being analyzed. |
| 1998 | Monitor selected upriver piscivorous waterbird colonies to monitor changes in population size and diet composition. | All upriver colonies were censused using aerial photography. Three colonies were monitored to determine diet composition, including one small Caspian tern colony at Three-mile Canyon Island. Juvenile salmonids predominated in the diet of upriver terns. |
| 1998 | Test the feasibility of methods to relocate the Caspian tern colony to a new nesting location as a means to reduce their impact on survival of juvenile salmonids. | Tern decoys and an audio playback system broadcasting tern calls were used to attract several hundred terns to a site where they had not previously nested. Nesting behaviors were observed and some pairs successfully laid eggs. |
| 1998 | Recover PIT tags at the Rice Island tern and cormorant colonies and the Crescent Island Caspian tern colony. | With help from NMFS, roughly 48,000 PIT tags were detected on Rice Island and another 10,000 on Crescent and Three-Mile Canyon islands, located on the Columbia River above John Day Dam. We are currently working with NMFS to analyze these data. |

### *Objectives and tasks*

| Obj 1,2,3 | Objective | Task a,b,c | Task |
|---|---|---|---|
| 1 | Monitor and evaluate the efficacy of management initiatives implemented to reduce avian predation on juvenile salmonids. | a | Conduct surveys to assess changes in size and productivity of managed piscivorous waterbird colonies. |
| | | b | Determine changes in diet |

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| | | | composition and smolt consumption rates of managed piscivorous waterbirds. |
| | | c | Assess changes in foraging distribution, foraging range, and habitat use of managed piscivorous waterbirds. |
| | | | |
| 2 | Determine impacts of unmanaged piscivorous waterbird colonies on survival of juvenile salmonids. | a | Conduct surveys to estimate size and productivity of unmanaged piscivorous waterbird colonies. |
| | | b | Determine diet composition and smolt consumption rates of unmanaged piscivorous waterbirds |
| | | c | Assess foraging distribution, foraging range, and habitat use of unmanaged piscivorous waterbirds. |
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| 3 | Assist in developing a long-term management plan to reduce avian predation on juvenile salmonids in the lower Columbia River. | a | Provide technical assistance to the Interagency Avian Predation Working Group to refine and further develop existing management initiatives (i.e., adaptive management). |
| | | b | Test the feasibility of various management options to reduce predation on juvenile salmonids by piscivorous waterbirds in the lower Columbia River. |
| | | c | Provide technical assistance to the Interagency Avian Predation Working Group to develop new management initiatives, as needed. |
| | | d | Survey and inventory existing nesting habitat for piscivorous colonial waterbirds outside the Columbia Basin and provide technical assistance on restoration and conservation of critical nesting habitat. |

### *Objective schedules and costs*

| Obj # | Start date mm/yyyy | End date mm/yyyy | Measureable biological objective(s) | Milestone | FY2000 Cost % |
|---|---|---|---|---|---|
| 1 | 3/2000 | 12/2000 | Assess the effectiveness | 1. Completion of | 60.00% |

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| | | | of management initiatives implemented to reduce smolt losses to birds | field data collection.<br><br>2. Completion of data analysis<br><br>3. Submission of draft annual report<br><br>4. Submission of final annual report | |
| 2 | 3/2000 | 12/2000 | Determine the need for further mitigation for smolt losses to birds | 1. Completion of field data collection.<br><br>2. Completion of data analysis<br><br>3. Submission of draft annual report<br><br>4. Submission of final annual report | 30.00% |
| 3 | 1/2000 | 12/2000 | Assist in the development of effective management alternatives to reduce unacceptable levels of predation on juvenile salmonids by piscivorous waterbirds | 1. Completion of field data collection.<br><br>2. Completion of data analysis<br><br>3. Submission of draft annual report<br><br>4. Submission of final annual report<br><br>5. Provide input on out-year management. | 10.00% |

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| | | | | **Total** | 100.00% |

**Schedule constraints**
The implementation of a management plan to reduce predation by piscivorous waterbirds on juvenile salmonids will depend on decisions made by the Interagency Avian Predation Working Group comprised of regional fish and wildlife managers and stakeholders.

**Completion date**
2002

## Section 5. Budget

**FY99 project budget (BPA obligated):** $515,000

### *FY2000 budget by line item*

| Item | Note | % of total | FY2000 |
|---|---|---|---|
| Personnel | 1 Post Doc, 2 Masters students, 5 field technicians | %14 | 92,700 |
| Fringe benefits | | %3 | 16,800 |
| Supplies, materials, non-expendable property | radio tags (2 studies), switchers/antennas, doubly-labeled water | %14 | 86,900 |
| Operations & maintenance | aerial photos, vehicles, two field offices, telemetry flight time, tuition | %14 | 89,600 |
| Capital acquisitions or improvements (e.g. land, buildings, major equip.) | radio-telemetry receivers | %9 | 60,000 |
| NEPA costs | | %0 | |
| Construction-related support | | %0 | |
| PIT tags | # of tags: | %0 | |
| Travel | | %1 | 9,500 |
| Indirect costs | | %11 | 69,900 |
| Subcontractor | CRITFC | %34 | 217,200 |
| Other | | %0 | |
| **TOTAL BPA FY2000 BUDGET REQUEST** | | | $642,600 |

### *Cost sharing*

| Organization | Item or service provided | % total project cost (incl. BPA) | Amount ($) |
|---|---|---|---|
| USACE | Provided funds in 1999. Obligated funds in 2000? | %0 | 0 |
| USFWS | Provided funds in 1999. Obligated funds in 2000? | %0 | 0 |
| NMFS | Provided funds in 1999. Obligated funds in 2000? | %0 | 0 |
| | | %0 | |
| | | **Total project cost (including BPA portion)** | $642,600 |

### *Outyear costs*

| | FY2001 | FY02 | FY03 | FY04 |
|---|---|---|---|---|
| **Total budget** | $550,000 | $200,000 | $0 | $0 |

## Section 6. References


| Watershed? | Reference |
|---|---|
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