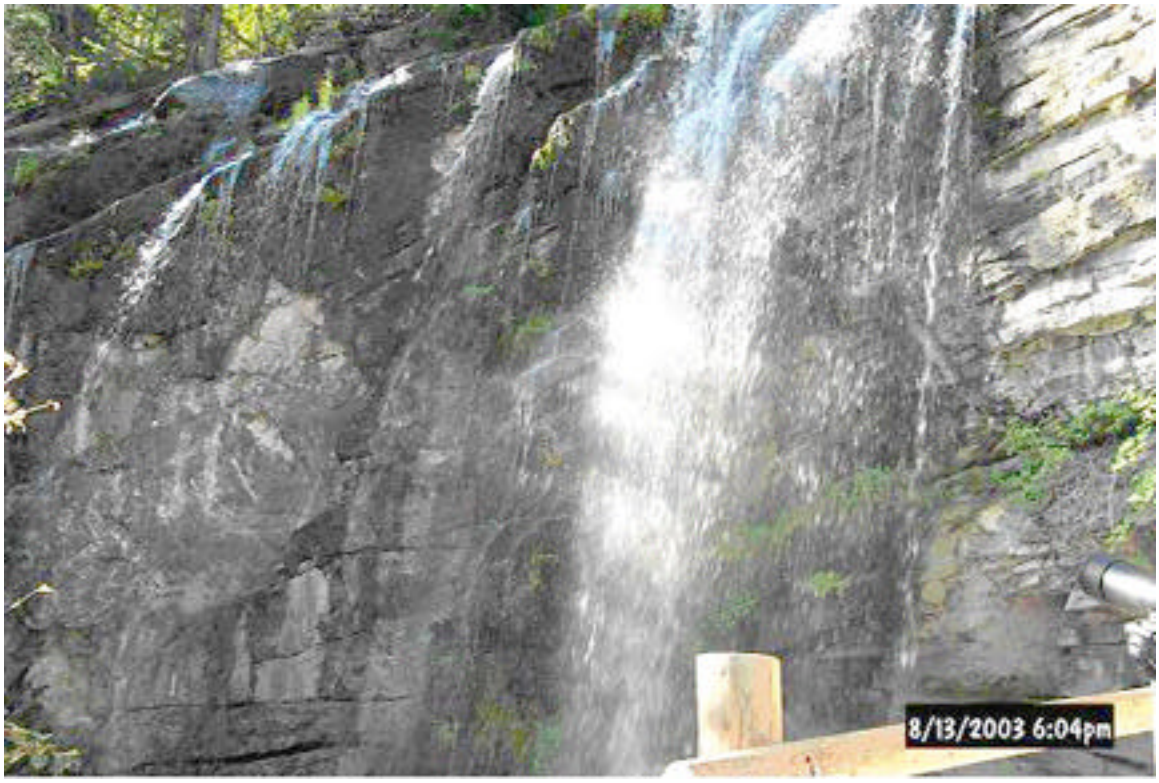
INVENTORING BLACK SWIFT POPULATIONS AT WATERFALLS IN THE NORTHERN PACIFIC RAINFOREST BIRD CONSERVATION REGION



Summer 2003
Final Report

Bob Altman
American Bird Conservancy
Coordinator, Northern Pacific Rainforest Bird Conservation Region

Introduction

This report summarizes data collected during summer, 2003 by approximately 100 volunteers who participated in an inventory of Black Swift populations at waterfalls in the Northern Pacific Rainforest Bird Conservation Region (NPRBCR; i.e., northwestern California; western Washington, Oregon, and British Columbia; and southeastern and southcoastal Alaska). This project represents the first systematic effort to establish a list of waterfalls essential to Black Swift conservation in this region. The project also provides data to assist in the process of determining the continental population of Black Swifts.

Background

The Black Swift is a nearctic-neotropical migrant that is one of the least known breeding species in the North America. Black Swift is a Partners in Flight Continental Watch List species, and has been designated as a priority species for conservation in the NPRBCR based on the Partners in Flight Species Assessment and Prioritization Process (Carter et al. 2000), and by the U.S. Fish and Wildlife Service in their Birds of Conservation Concern (2002) list. It also has been designated as a priority species in Bird Conservation Plans for Oregon-Washington, British Columbia, and Alaska.

Monitoring Black Swift populations is problematic because of their unique breeding ecology. Standard count-based monitoring techniques (e.g., point counts, transects) are not effective, and even at their very specific nesting habitat, monitoring is challenging due to the following factors:

* nesting habitat can be relatively inaccessible;
* birds can be difficult to detect due to their swift, erratic flight combined with minimal or no vocalizations;
* birds appear only infrequently at the nesting habitat (and often just at dusk) as they travel large distances to forage opportunistically on aerial insectivores, and
* the species occurs in relatively low densities throughout the region.

Known nests of the Black Swift are located almost exclusively at waterfalls (except for a few in sea caves) with very specific nest site characteristics. Despite its regular occurrence near several waterfalls in the NPRBCR, nesting has yet to be confirmed in Alaska and Oregon, and only two nests have been reported in British Columbia (Campbell et al. 1990) and one in Washington (Smith et al. 1997). Knorr (1961) described five criteria for Black Swift nest sites, and Foerster and Collins (1990) reported that these were present at all active nest sites in southern California. These include:

* Water - Water is present at every nest site, varying from a trickle to a rushing torrent.
* High relief - The nesting site must have a commanding position above the surrounding terrain so that swifts flying out of the nest are automatically at potential foraging altitude above the surrounding valley.
* Inaccessibility - The site must be inaccessible to terrestrial marauders and accessible only to winged animals or humans with climbing gear.
* Darkness - The nest is in a position such that the sun will not shine on an occupied nest.
* Unobstructed flyways - The flyway from the nest must be free of obstruction.

Objectives

There have been no standardized population surveys of potential nesting habitat anywhere in the NPRBCR. A protocol for a standardized survey at waterfalls was recently developed and has been successfully used in Colorado the last few years (Schultz and Levad 2001). This project used that protocol to establish a baseline population status for Black Swift at waterfalls throughout the NPRBCR. This will provide a snapshot of the nesting status of Black Swift across a large geographic part of its range that can be used as a reference for future monitoring, and used in conjunction with other efforts to establish a population estimate for the species. This project also will provide the first listing of sites along the northern Pacific Coast essential for Black Swift conservation. It is anticipated that identification of these sites will lead to an evaluation of threats and development of strategies to secure conservation of Black Swifts at each site.

Methods

The identification of waterfalls to be surveyed was based on several factors. In Oregon and Washington, a web page was created (http://home.pacifier.com/~neawanna/BLSW/BLSW.html) that listed opportunities based on known waterfalls where Black Swifts have been reported, and other waterfalls meeting the nesting habitat criteria. The former was based on a literature review (e.g., Andres et al. 1999, Campbell et al. 1990, Smith et al. 1997, Marshall et al. 2003) for information on waterfalls where Black Swifts have been reported. Additionally, knowledgeable ornithologists, both professional and amateur, were contacted for information on Black Swift occurrences and potential nest sites. Several books and internet sites that describe waterfalls were reviewed, and those descriptions were used to subjectively evaluate the waterfalls potential for Black Swift nesting. Priority waterfalls were indicated on the web page based on existing knowledge and/or their descriptions.

The project provided a unique opportunity to implement a BCR-wide monitoring effort for a high priority species using extensive volunteer labor. Broadcasting the solicitation for volunteers was accomplished through several means. Announcements were made on the state email birding list-serves, OBOL (Oregon) and Tweeters (Washington), and also sent to select agency and organization personnel to distribute in their networks. Volunteers were asked to sign up for a waterfalls to avoid redundancy.

Monitoring data collection occurred during summer 2003. Surveys were generally conducted during a 2-hour period prior to dusk as Black Swifts tend to concentrate nest visits at this time, and it is the best time for observing breeding adults near the nests (Foerster and Collins 1990). Most surveys were conducted by at least two individuals to enhance visual detectability and for safety reasons. Volunteers were asked to survey each waterfall once in July and once in August and record the highest number of adult individuals observed at any one time during each survey. Data sheets and instructions for data collection were provided on the web page. In addition to counting individual birds, volunteers were encouraged to look for nests and document any nesting activity.

Results and Discussion

One hundred and three participants (>90% volunteers) spent 513 hours in observation of 82 waterfalls primarily in Oregon, Washington, and Alaska. It is likely that an equal amount of time was spent by

participants in travel to and from the sites. Forty-four of the 82 waterfalls were visited two times as requested. Of the remainder, 32 waterfalls were only visited once, five waterfalls were visited three times, and one waterfall was visited four times.

Black Swifts were observed during the observation of 36 waterfalls (Table 1). Of these, birds were observed at the falls at 18 waterfalls (1 CA, 1 BC, 6 OR, and 10 WA), and the remainder (18) were observations of birds in the sky only. Most of these (12) were of birds in the sky directly above the falls. These observations do not necessarily indicate a nesting relationship with the falls under observation, although they may, especially if the observation occurred late in the evening. At a few of the waterfalls listed in Table 1, the waterfalls was a significant distance away (>100m) and the Black Swift sightings were of birds moving along the river corridor, again not necessarily in association with the waterfall. Among this type of sites in Table 1 are Big Devil Falls, WA, Gorge Creek Falls, WA, Parallel Falls, AK, Magnolia Falls, AK, Hyder Island Estuary, AK, and Super Natural Ridge, BC.

Table 1. Black Swift Detections During Observations of Waterfalls in the Northern Pacific Rainforest Bird Conservation Region, Summer 2003.

Waterfalls	**Black Swifts Observed in Sky or along River Only**	**Black Swifts Observed at the Falls on at least One Visit**	**Nest Location Confirmed**	**Nest Location Suspected**
McArthur/Burney Falls, CA		X		
Lemolo Falls, OR		X		X
Warm Springs Falls, OR		X		X
Barr Creek Falls, OR	X			
Toketee Falls, OR		X		
Grotto Falls, OR		X		
Mill Creek Falls, OR	X			
Salt Creek Falls, OR		X		
Proxy Falls, OR	X			
Spirit Falls, OR	X			
Starvation Creek Falls, OR	X			
Hamma Hamma Falls, WA	X			
Snoqualmie Falls, WA	X			
Bridal Veil Falls, WA		X		X
Franklin Falls, WA		X		
Denny Camp Falls, WA		X		
Silver Falls, WA		X	X	
Wells Creek Falls, WA	X			
Nooksack Falls, WA	X			
Cascade Falls, BC		X	X	
Johannesburg Falls, WA	X			
Johannesburg Falls, WA (left)		X		
Johannesburg Falls, WA (middle)		X		

Big Devil Falls, WA	X *			
Gorge Creek Falls, WA	X *			
Ketchum Falls, WA		X		
Rainbow Falls, WA		X		
Cascade Basin Falls, WA	X			
Rainy Lake Falls, WA		X		
Horseshoe Basin Falls, WA		X		X
Andrews Slough, AK	X *			
Parallel Falls, AK	X *			
Magnolia Falls, AK	X			
Falls Lake, AK	X			
Super Natural Ridge, BC	X *			
Hyder Island Estuary, AK	X *			

* observations were of birds flying along the river corridor

Nest locations were confirmed (a bird was observed going to a nest) at 2 waterfalls (Silver Falls, WA and Cascade Falls, BC), and suspected (birds were seen going into a suitable site, but no nest was observed) at an additional 4 waterfalls (Lemolo Falls, OR, Warm Springs Falls, OR, Horseshoe Basin Falls, WA, Bridal Veil Falls, WA) (Table 1).

Volunteer and Agency Staff Participation

The interest and response of people to participate in the project was astounding, especially by volunteers from the birding community. Greater than 90% of the effort was conducted by volunteers. In addition to volunteers, in Oregon and Washington some agencies (most notably the BLM and USFS) used the opportunity to have staff collect data on waterfalls within their districts. In Alaska, the project was financially supported by the U.S. Forest Service, and several staff were funded to participate. It is also important to note that many of the volunteers were federal and state land management agencies staff who conducted the surveys on their own time.

Observation Location

There are a number of factors that determine the best location for observing Black Swifts at waterfalls. In general, observations immediately at the waterfalls, and in particular at the base of the waterfalls, provides a distinct advantage for documenting Black Swift use of the falls for nesting/roosting because of the enhanced visibility for detecting birds by looking upward with the lighter sky as the background. Observations at the top of the falls or out some distance away from the falls may be suitable for seeing birds from the sky down to the falls, but once the birds get down below the skyline or down to the falls, it becomes difficult to see them with the darker background. This is even more pronounced as it starts to get dark, which is when the birds are most often first appearing near the falls.

For some waterfalls, it is problematic and potentially dangerous to try to get to the base of the waterfalls for an observation location. This is especially true of a volunteer effort with people of various physical abilities and comfort levels in trying to get close to the falls. There is the added concern of having to walk out of the site after dark. Thus, participants were encouraged to place their safety as the highest priority and to access an observation point that they felt comfortable with. However, even observation points at some distance from the falls provided valuable data about Black Swift use of the area above and in the

vicinity of the falls. This information can be used to then target certain falls for a closer observation point if possible, to determine if the falls are being used.

Evening Observation Times: Stay As Late as Possible

One salient observation from the described experiences of volunteers and a review of the data is that at most waterfalls the birds were first detected relatively late in the evening, usually as darkness is affecting visibility. At several waterfalls, it was very dark when they first appeared and observers were only able to detect the birds because they were immediately below the falls looking into what minimal light was provided by the sky or they had night vision goggles to assist them. This has significant implications on confirming the presence of Black Swifts at waterfalls, since substantial effort in location (at the base of the falls) and timing (staying till well after sunset) may be required.

In July and through the first week of August, the earliest observation of Black Swifts at a waterfalls was 8:50 PM (n=9), and in early July they first appeared as late as 9:30 PM. Birds could have been missed coming to the falls earlier, but the consistency of all the records near 9:00 PM and later suggests that this is probably typical. From early through mid-August, the first appearance at the waterfalls was between 8:10 PM and 8:50 PM (n=6) with one exception, 7:20 PM at Salt Creek Falls, OR. By late August (early September), the first appearance at a waterfalls was just before 8:00 PM (n=3). Although the times of the later dates are earlier, it is getting darker earlier and the relationship of these times to sunset is about the same. These times also reflect close to 1,000 miles difference in latitude which affects the time of sunset.

It is important to note that the above times often do not reflect the first detection of Black Swifts during the observation period. Frequently (but not always), birds were seen in the sky well before appearing at the falls, and many times birds seen in the sky did not result in birds seen at the falls later. Thus, being at the observation point for the entire 2-hours is important to maximize all detections of Black Swifts.

The practical and safety issues of staying till after dark, especially for volunteers, is problematic. There were many waterfalls where the surveyors departure at 9:00 PM or earlier during July and early August may have caused them to miss the birds arrival at the falls. The coordinator is reviewing the data to determine which waterfalls might warrant revisiting in 2004 based on the potential for missing birds after the surveyor's departure.

Seasonal Observation Timing

Our recommended time frame for seasonal surveys of July and August seems appropriate, since birds were detected throughout that period. The earliest survey was conducted on June 30 and the latest September 8. The earliest date for a Black Swift detection was July 7, and the latest September 3. Most of the effort (approximately 70%), was between July 15 and August 21. It may be worthwhile to emphasize more effort during the early part of July, and perhaps even late June at more southern latitudes.

Night Vision Goggles

Several surveyors in south-central Oregon had the opportunity to use Night Vision Goggles. The surveyors were observing from the base of the waterfalls in each instance, but they made the comments that they felt their ability to see the birds were enhanced by the goggles.

Accessibility in Alaska and Elsewhere

Based on the experiences of surveyors in Alaska, several factors indicate the need for an alternative to monitoring nesting populations of Black Swifts at waterfalls. This is due to the fact that there are many waterfalls, and most of them are not safely or realistically accessible to secure an observation point at the falls or within a reasonable distance of the falls. This also is likely to be the case throughout most of coastal British Columbia, and was experienced to a lesser degree than Alaska in north-central Washington in North Cascades National Park.

An alternative to monitoring Black Swift populations where there are many waterfalls and/or they are relatively inaccessible may be to focus on **Strategic Location Counting** of Black Swift flybys rather than counting nesting birds at waterfalls. Strategic location counting of birds was tested at a few sites in Alaska and North Cascades National Park and appears to be an effective alternative to collecting data on populations where waterfalls are not accessible. These surveys should be done annually if possible using the same protocol for waterfalls (i.e., 2 hours before dark, once in July and once in August). The locations selected for these surveys should be strategically placed along rivers where there are waterfalls nearby or are known passage areas for Black Swifts (e.g., mouths of rivers that lead to waterfalls upstream), have good visibility in the sky overhead and up and down stream, and have safe access with minimal traffic.

An example of the potential data that can be collected using this technique of strategic location counting is from one of the locations in North Cascades National Park along the Skagit River where we recorded 151 Black Swifts flying mostly downstream during a 2-hour period. Knowledge of these numbers of birds in the area would not have been realized with just visits to waterfalls. Additionally, the nearly absolute directional movement of the birds (downstream in this instance) provided a significant clue in our geographic focusing of efforts on nesting waterfalls.

Use of strategic location counting of Black Swifts could also be used in concert with counts at waterfalls to gain a better understanding of the population in an area. If conducted annually, these surveys could provide trend information over the long-term, and be used to compare with the results of waterfall population counts, and trend information from the Breeding Bird Survey.

Maps and Databases

The web page has an interactive map with all the waterfalls surveyed and a link to a database with the results from each survey. Additionally, a database and map of all historic and 2003 Black Swift sightings in Alaska was prepared by Gwen Baluss, U.S. Forest Service as part of the project. This also can be accessed on the web page.

Conservation Implications

An essential component of Black Swift conservation is the identification and protection of their unique nesting sites. Conservation efforts for Black Swift have been precluded up to this point because so few nesting sites have been identified. With the significant increase in identification of nesting sites as a result of this project, land managers can begin to address potential threats to these sites. Threats might include activities such as forest management adjacent to the sites and elsewhere in the watershed that may impact stream flows.

Literature Cited

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Comments: Breeding population is difficult to determine; any observations of Black Swifts during the breeding season are assumed to be breeding animals. Number of Occurrences: B = 6 - 20.Â 2003. Inventoring Black Swift populations at waterfalls in the Northern Pacific Rainforest Bird Conservation Region. American Bird Conservancy. 8 pgs. http://www.orbirds.org/blswreport.pdf . | D. B. Marshall, M. G. Hunter, and A. L. Contreras (editors), Birds of Oregon: A General Reference. Oregon State University Press, Corvallis. | Rank Author The largest swift normally found in North America, uncommon and local in the far west. Where it occurs, it may be seen flying very high, gliding and wheeling gracefully in pursuit of flying insects. The Black Swift seems to be limited in range by its very particular choice of nesting sites: it requires shady, sheltered spots on vertical cliffs totally inaccessible to predators, and often nests on the damp rock behind waterfalls.Â The National Audubon Society protects birds and the places they need, today and tomorrow, throughout the Americas using science, advocacy, education, and on-the-ground conservation. Bald Eagle.Â Conservation status. Uncommon and local, and surveys suggest that populations have been declining significantly in recent years. Family. Swifts. Habitat. In the Pacific Americas Flyway (hereafter, Flyway), 11% of shorebird populations demonstrate long-term declines, another 46% have unknown population trends and 43% are stable.Â Pervasive surface water declines were prevalent in northern snowmelt watersheds (lakes â€27%, wetlands â€47%) while largely stable in monsoonal watersheds to the south (lakes â€13%, wetlands +8%).Â The incorporation of women in the sustainable management and conservation of the natural resources on which they rely, illegal deforestation and other degrading practices may decrease, as local people have vested interests in forest resources to remain abundant in their local communities.