

IDAHO BLACK SWIFTS: NESTING HABITAT AND A SPATIAL ANALYSIS OF RECORDS

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ABSTRACT: The Black Swift (*Cypseloides niger*) was first confirmed breeding in Idaho in 1997 and 1998 when four and five pairs, respectively, nested near Shadow and Fern falls along the North Fork Coeur d'Alene River, Shoshone County. Nest sites were on cliffs composed of argillite within the large Precambrian Belt Supergroup geologic formation and associated with a narrow riparian strip of western redcedar and devil's club. The microcommunity along cliff faces consisted of a variety of mosses, liverworts, and ferns. We analyzed all Black Swift sight records for Idaho, finding that 78% were from the breeding season and most breeding-season records (96%) were associated with the Precambrian Belt Supergroup.

The Black Swift (*Cypseloides niger*) breeds locally in the mountains and along the coasts of western North America from southeast Alaska south to Mexico and east to central Colorado (AOU 1983). Nests are associated with coastal cliffs (Vrooman 1901), waterfalls (Smith 1928), and caves (Davis 1964). Although the Black Swift breeds in adjacent areas in the northern Rocky Mountains (Kondla 1973, Holroyd and Holroyd 1987, Hunter and Baldwin 1972), details of its status in Idaho are lacking. Larrison et al. (1967) considered the Black Swift a rare migrant and possible breeder, while Burleigh (1972) failed to mention the species. Since 1985, however, reports of summering Black Swifts have increased, and discovery of four nests in 1997 (Svingen and Trochlell 1998) along the North Fork Coeur d'Alene River, Shoshone Co., provided the first confirmation of breeding in Idaho (Stephens and Sturts 1998).

Here we describe the known nesting habitat of Idaho Black Swifts, explore the relationship of a prominent geologic formation to sight records, and suggest other potential suitable areas in Idaho for breeding swifts.

STUDY AREA AND METHODS

Black Swifts nested at two waterfalls, Shadow and Fern, on Falls Branch of Yellow Dog Creek in the North Fork Coeur d'Alene River watershed, Idaho Panhandle National Forest (47° 45' 13" N, 116° 06' 19" W). The region, characterized by steeply dissected mountains between 600 and 2570 m elevation, lies over the Precambrian Belt Supergroup, a large formation of sedimentary rock (Hobbs et al. 1965). Annual precipitation ranges from 648 to 1415 mm, with 70% falling as snow (R. Kasun pers.

comm.). The temperature at nearby Kellogg, Idaho, averages about 8° C, and the climate receives maritime influence. Winters are relatively mild and summers are dry (see ecoregion M333Ba, Nesser et al. 1997).

We visited the nesting site on 8, 23, and 24 August 1998 and characterized the waterfalls and associated macro- and micro-habitats. We compiled all known Idaho Black Swift sight records from 1929 through 2001 from several sources: Stephens and Sturts (1998); *Audubon Field Notes, American Birds*, and their successors; U.S. Fish and Wildlife Service (USFWS) Breeding Bird Surveys; unpublished records of M. T. Jollie (Univ. of Idaho); the database of Thomas Rogers, long-time regional editor for *Audubon Field Notes* and *American Birds*; and individual birders. Using Black Swift breeding phenology (Hunter and Baldwin 1962; Marin 1997, 1999) and our observations, we classified as summer (breeding) sight records from 7 June through 31 August; all others were migration records. Finally, we mapped records in the context of a USFWS latilong grid over the distribution of the geology found at the nesting site.

RESULTS

Nest-Site Habitat

Shadow and Fern falls face east and lie in the bottom of a steeply sloped (45°) valley. Elevation of the precipices of Shadow and Fern falls is 998 and 980 m, respectively, with Shadow Falls about 100 m upstream of Fern Falls. Although the creek flows through a narrow riparian macro-community dominated by western redcedar (*Thuja plicata*) and devil's club (*Oplopanax horridum*) (Cooper et al. 1991), this community is in a mostly later seral state dominated by western hemlock (*Tsuga heterophylla*) and lady fern (*Athyrium felix-femina*). It contains the following key plants: twisted stalk (*Stetopus stropoides*), northern wood fern (*Dryopteris expansa*), Anderson's swordfern (*Polystichum andersonii*), Dewey's sedge (*Carex deweyana*), fool's huckleberry (*Menziesia ferruginea*), and smooth willowweed (*Epilobium glaberrimum*). Upslope of the narrow, later successional riparian zone the plant community quickly grades to a moist western hemlock/oak fern (*Gymnocarpium dryopteris*) community and then to a drier and younger western hemlock/queencup beadlily (*Clintonia uniflora*) community (Cooper et al. 1991) with few or no species associated with moist riparian areas. We observed a few old stumps, likely of the western white pine (*Pinus monticola*), indicating some historic logging and associated burning of the residual logging debris that was scattered across the site (probably before 1940s), but there has been no recent logging nearby.

Rock outcrops at both falls are green or bluish-gray thinly layered (0.2 to 10 cm) argillite, with occasional thicker layers (10 to 15 cm) of impure quartzite. Argillite layers generally contain abundant mud cracks and erode more readily than do the quartzites. Thicker, more resistant quartzites generally form tops of precipices over which water descends, with less resistant, thinly layered argillite [which dips back (8° to 12°) into the face of the cliff] forming undercut faces of cliffs. Rocks on undercut faces are moderately fractured, slumping forward in places until they are almost horizontal. On the basis of correlations with previously mapped areas, rock

outcrops most likely represent the upper Wallace Formation within the Precambrian Belt Supergroup (Hobbs et al. 1965).

Shadow Falls is about 8 m tall, and the curtain (free falling water no longer in contact with the cliff) is 5 m high, with the back of the falls cut at about a 45° angle and approximately 2 m deep at the base. The main fall is 4 m wide, with a more fragmented curtain to 5 m, and the total width of dripping water is 8 m. Fern Falls is approximately 5 m tall; its curtain is 3 m high with a backcut similar to Shadow Falls', and the drip zone is about 12 m wide.

We found four nests, each with one nestling, at Shadow Falls in 1998 (Figure 1). The lowest nest was near the southern edge of the curtain, behind falling water, and about 3.5 m above the bottom of the falls. The second nest was about 1 m directly above the first nest, behind the curtain, and about 0.3 m below where the curtain began. A third nestling was 0.75 m due north of the second nest along a nearly horizontal ledge. The fourth nest was not behind falling water but about 1.5 m due south of the second nest and underneath an overhang 5 m deep that extended about 8 m to the southeast. The single nest and nestling at Fern Falls was only 2 m above the bottom of the falls near the northern edge of the main curtain (Figure 2).

The dominant micro-community on the wet cliff faces included broom moss (*Dicranium scoparium*), eurhynchium moss (*Eurhynchium praelongum*), stair step moss (*Hylocomium splendens*), leucolepis moss (*Leucolepis menziesii*), platydictya moss (*Platydictya jungermannioides*), big redstem moss (*Pleurozium schreiberii*), bentleaf moss (*Rhytidiadelphus squarrosus*), snake liverwort (*Conocephalum conicum*), lung liverwort (*Marchantia polymorpha*), yellow-ladle liverwort (*Scapania bolanderi*), lady fern, fragile fern (*Cystopteris fragilis*), western polypody (*Polypodium hesperium*), and oak fern. Nests appeared to be made exclusively from some or all of these bryophytes.

Currently the site is indirectly protected under the USDA Forest Service's conservation protocols that require maintaining the riparian community for 50 m on either side of the creek. The falls are a popular tourist spot, with a well-maintained trail leading to Shadow Falls. Despite heavy visitation, most persons we talked with were unaware of nests. Black Swifts have high fidelity to nest sites (Collins and Foerster 1995, Marin 1997), and our observation that nearby human activity had no impact on breeding concurs with Foerster and Collins (1990), although Hirshman (1998) found that nestlings closer to human activity fledged later than those in less disturbed areas.

Knorr (1961) listed five characteristics of Black Swift nest sites: (1) presence of moving water; (2) high relief so swifts leaving nests are automatically at potential foraging altitude above surrounding terrain; (3) inaccessibility to terrestrial predators; (4) sunlight not reaching occupied nests; and (5) unobstructed flyways immediately in front of nests. After additional work, Knorr (1994) concluded that high relief is not a requirement, although the characteristic is almost invariably present, and added a sixth criterion, the presence of niches in rocks for nest sites.

Flowing water, inaccessible nests, and unobstructed flyways were present at both Shadow and Fern falls. Nests at Shadow Falls never received direct sunlight, but the nest at Fern Falls received about 20 minutes of direct sunlight around 08:30 the last days of August (J. Acton pers. comm.). Smith



Figure 1. Three Black Swift nestlings behind Shadow Falls, Shoshone Co., Idaho.

Photo by Dave Holick



Figure 2. A Black Swift nestling at Fern Falls. Shoshone Co., Idaho.

Photo by Dave Holick

(1928) reported sunlight to shine directly on a California nest site for an hour in early morning. Because of their location in the bottom of a narrow, steep valley, neither Shadow nor Fern falls offers immediate high-altitude foraging for adults. Like some Black Swifts in southern California (Foerster and Collins 1990), birds at Shadow Falls also flew through a maze of tree branches when exiting the nesting site (Figure 3; D. Johnson pers. comm.). The area immediately in front of the nests, however, was unobstructed as defined by Knorr (1961). Farther upstream of Shadow and Fern falls at 1054 m elevation, we found three additional falls, heights 2, 3.5, and 6 m, that were characterized by the thicker, more resistant quartzites and lacked layering and nests. Marín (1997) concluded cypseloidine swifts breed by water to ameliorate daily temperature changes around the nest and that Knorr's (1961) other criteria were secondary consequences of nesting near waterfalls. Our observations imply that high relief and lack of direct sunlight striking an occupied nest are less important ecological characteristics for successful Black Swift breeding than the presence of moving water, protection from terrestrial predators, available niches for nest construction, and unobstructed flyways.

Statewide Distribution

As annotated in the appendix, Idaho's 82 sight records of the Black Swift are from 34 general locations, shown in Figure 4 against the range of sedimentary rocks of the Precambrian Belt Supergroup. The 1929 sighting in latilong 5 probably formed the basis for the species being listed by Larrison et al. (1967:128) and Larrison (1981:171). Except for that sighting



Figure 3. View directly downstream from Shadow Falls. An adult Black Swift was observed flying through this forest when leaving the nest,

Photo by Dave Holick

and one in 1973 (latilong 1), all records have been since 1985. Most records (64, 78%) are from the breeding season. Most breeding-season records (96%) are from Idaho's panhandle (latilongs 1 through 5) and associated with the Precambrian Belt Supergroup (Figure 4).

The three observations from latilongs 7, 8, 11, and 13 (15 July, 24 June, 12 June, and 8 July, respectively) probably represent widely dispersed

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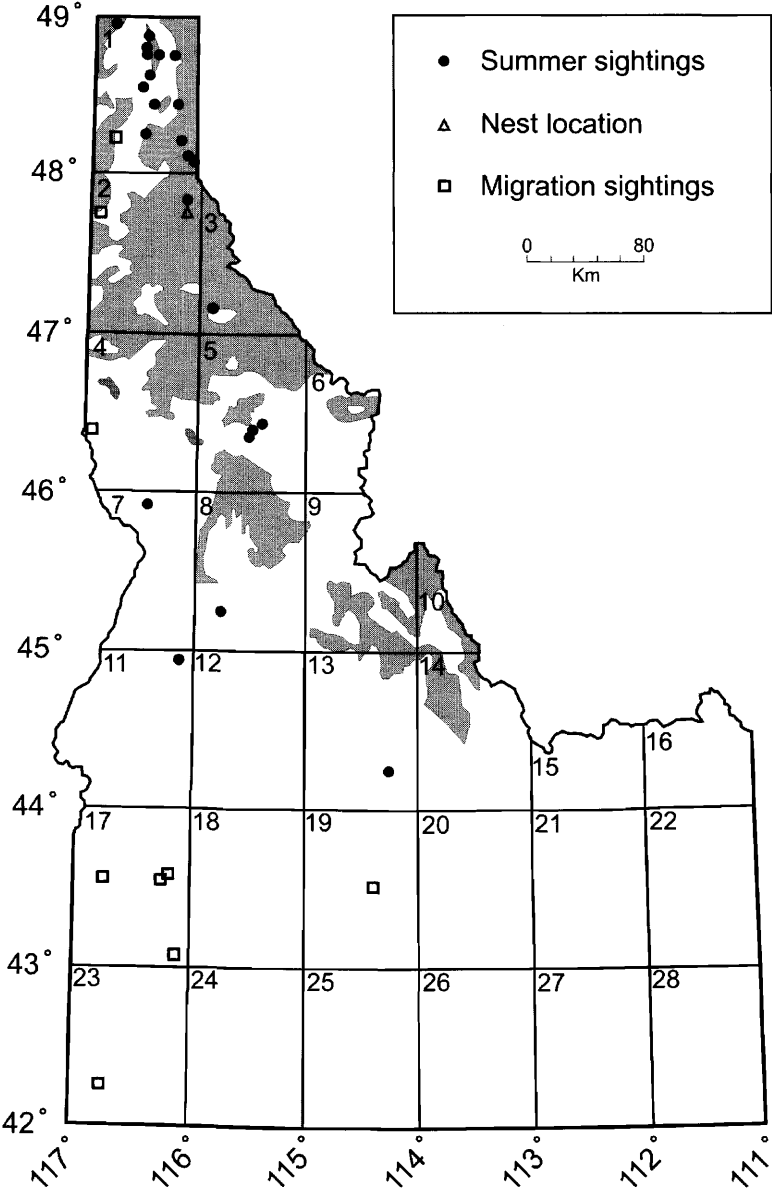


Figure 4. Latilongs, Black Swift sighting locations, and distribution of Precambrian Belt Supergroup sedimentary rocks (shaded areas) in Idaho. If the species has been sighted in both summer and migration at the same location, only a summer sighting is indicated. Adapted from our appendix, Stephens and Sturts (1998), and Idaho Geologic Survey (1978).

foraging adults. Although the Belt Supergroup is a large formation, south of the Lochsa River (generally latilongs 7+) the more highly metamorphosed Precambrian Belt rocks lose some of their layering as they change into schist, probably reducing the availability of nesting ledges like those at Shadow and Fern falls. Spring records from latilongs 17, 19, and 23 are too early for breeding, and fall records in latilong 17 are probably of migrating birds since adults and fledglings apparently begin migration immediately (Marín 1997).

Our observations of nest-site habitat at Shadow and Fern falls and the prevalence of summer sight records in latilongs 1 to 5 suggest that any northern Idaho waterfall on sedimentary rock may meet the requirements of nesting Black Swifts and should be investigated. Additional field work should enhance our knowledge of the distribution of Black Swifts in Idaho.

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APPENDIX—Idaho Black Swift Sightings

See Figure 1 for latilongs. Abbreviations: American Birds (AB), National Audubon Society Field Notes (FN), North American Birds (NAB), National Wildlife Refuge (NWR), breeding bird survey (BBS).

Latilong 1—**Boundary Co.** Smith Creek drainage (T64N R3W Sec. 4): 1 on 6 Jun 1998. Kootenai NWR: 1 on 20 Jun 1985, 20 during summer 1985 (AB 39:940, 1985), 1 on 16 May 1986, 12 on 20 Jul 1986, 1 on 1 Jun 1988, 20 on 13 Jun 1998, 5 on 24 Jun 2001. Along Farnham Creek (T64N R1W Sec. 33 & 34): 1 seen often during Jun 1998. Westside Road near Copeland Bridge: 1 with 200 Vaux's Swifts 29 Aug 1997. Myrtle Creek Road (T62N R1W): 4 on 15 Jul 1998. Naples BBS (IDA-001) following Westside Road between Myrtle and Trout creeks: 3 on 11 Jun 1973, 7 on 12 Jun 1988, 6 on 11 Jun 1989, 1 on 23 Jun 1990, 2 on 30 Jun

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1994, 7 on 15 Jun 1997. Pack River Road at Upper Pack River Bridge: 2 with 4 Vaux's Swifts on 7 Aug 1993. Bonner's Ferry: 1 on 19 Jun 1989. McArthur Wildlife Management Area: 1+ on 27 Jul 2000. **Bonner Co.** Upper Grouse Creek Road: 4 to 6 above 1220 m elevation during Jun and Jul from 1988 through 1994. Clark Fork River between Clark Fork and the Cabinet Gorge Dam on the Montana border: 25+ on 6 and 24 Jun 1985 (AB 39:940, 1985), 2 on 10 Aug 1985, 1 on 13 Aug 1985 (Idaho Rare Bird Committee 3-88), 2 on 23 Jul 1986 (AB 40:1231, 1986), 4 to 6 each summer from 1988 through 1996. North of Clark Fork along Lightning Creek (T56N R2E Sec. 13): 11 with Vaux's Swifts on 16 Jun 1989 (AB 43:1344, 1989), "many" on 13 Jun 1991. Schweitzer ski area, Sandpoint: 2 soaring on 18 Jul 1997. Along the Priest River north of Priest River: 6 Jun 2001.

Latilong 2—**Kootenai Co.** North shore Lake Coeur d'Alene in Coeur d'Alene: 1 dead female on 28 May 1998 (Idaho Museum of Natural History 2643). **Shoshone Co.** North Fork Coeur d'Alene River near Cinnamon Creek (T52N R3E): 2 on 31 May 1989, 1 with Vaux's Swift on 1 Jun 1997 (FN 51:1025, 1997), 1 on 30 Aug 1997. North Fork Coeur d'Alene River, Shadow and Fern falls (T51N R3E Sec. 20): 5 including 3 and 1 nestlings, respectively, on 28 and 30 Aug 1997 (FN 52:95, 1998), Fern Falls nestling photographed clinging vertically to its nest was erroneously published horizontally (FN 52:143, 1998), 1 adult on a Shadow Falls nest on 8 Jun 1998, 1 adult on 22 and 23 Jun 1998, 5 nestlings (4 at Shadow Falls and 1 at Fern Falls) 26 Aug 1998 (NAB 53:80, 1999), 4 nestlings (3 at Shadow Falls and 1 at Fern Falls) on 27 Aug 1999; 3 nestlings at Shadow Falls on 9 Aug 2000; 4 nestlings (3 at Shadow Falls and 1 at Fern Falls) on 24 Aug 2001.

Latilong 3—**Shoshone Co.** Middle Sister Lookout: 1 flew by at 2040 m on 4 Aug 2000.

Latilong 4—**Nez Perce Co.** Lewiston Orchards: 5 or 6 on 27 May 1980.

Latilong 5—**Idaho Co.** Lochsa River, Wilderness Gateway Campground: 1 on 14 Jul 1984, 3 on 12 Jun 1987, 5 on 17 Jun 1989 (Boulder Creek, T35N R9E Sec. 34; AB 43:1344, 1989), 5 on 20 Aug 1990, 1 on 5 and 6 Jun 1993, 3 on 27 Jul 1997 (FN 51:1025, 1997). Selway River 64 km west of Lolo Pass: 1 with 8+ Vaux's Swifts on 30 Jul 1993. Confluence of Lochsa and Selway rivers: mouth of Pete King Creek: 1 foraging low with Vaux's Swifts during stormy weather on 17 Jun 1929; Johnson Bar: 1 with 10 Vaux's Swifts on 28 Jul 1993.

Latilong 7—**Idaho Co.** Joseph Plain along Billy Creek Road (about T29N & T30N R1W): 1 on 15 Jul 1989 (AB 43:1344, 1989).

Latilong 8—**Idaho Co.** Warren, Burgdorf BBS (IDA-208): 4 on 24 Jun 1989.

Latilong 10—Although Stephen and Sturts (1998) indicated a migration record, no data confirm it, and this is most likely a typographical error.

Latilong 11—**Valley Co.** Bear Basin, McCall: 2 on 12 Jun 2000 (NAB 54:402, 2000).

Latilong 13—**Custer Co.** Spar Canyon, 25 km south of Challis: 1 with a few White-throated Swifts flying around a 120-m east-oriented cliff on a south-facing slope at 1850 m elevation 8 Jul 1984.

Latilong 17—**Canyon Co.** Deer Flat NWR: 1 flew under low clouds and over the New York Canal at Lake Lowell on 5 Sep 1992 (AB 47:122, 1993). **Ada Co.** Lucky Peak Bird Observatory (T3N R3E Sec. 11): 30 to 35 on 25 Sep 1997 (FN 52:95, 1998); 3 on 10 Sep 2001. Boise: 3 on 4 Jun 1999 (NAB 53:412, 1999); 2 on 5 Sep 2000 (NAB 55:76, 2001). **Owyhee Co.** Near C.J. Strike Dam: 1 on 13 Oct 2000 (erroneously published as Elmore Co. in NAB 55:76, 2001).

Latilong 19—**Blaine Co.** Hailey: 1 about 8 m above the ground in a mixed flock of swallows at dusk on 2 May 1998 (erroneously published as 24 May in FN 52:361, 1998).

Latilong 23—**Owyhee Co.** Owyhee River: 2 on 1 Jun 1984.