

YELLOW-BILLED CUCKOO HABITAT USE IN SOUTHERN IDAHO 2019 ANNUAL REPORT



Yellow-billed Cuckoo detected during a standardized survey in 2019. Photo by Eric Schoenborn.

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ABSTRACT

The Intermountain Bird Observatory (IBO) conducted breeding season surveys for Yellow-billed Cuckoos in riparian areas with moderately to highly suitable habitat across southern Idaho (Idaho Department of Fish and Game [IDFG] Regions 3, 4, 5, and 6) from June 15–August 8, 2019. In Regions 3 and 4 our surveys were limited in scope, and in Region 4 they were augmented with surveys funded and completed by the Bureau of Land Management (BLM) within the Shoshone Field Office. The surveyed sites in 2019 included a mix of locations with historic cuckoo survey efforts and detections, as well as new areas. Specifically, we surveyed along the southeast edge of Lake Lowell at Deer Flat National Wildlife Refuge in Region 3, the Big Wood River and Magic Reservoir in Region 4, the Snake River upstream of American Falls Reservoir in Region 5, and the main stem and South Fork of the Snake River in Region 6. Using a standardized protocol, we conducted four repeat surveys (when logistics and private land access allowed) of 1, 5, 23, and 34 distinct survey sites in Regions 3, 4, 5, and 6, respectively.

Several other entities also completed Yellow-billed Cuckoo surveys and to thoroughly represent ongoing state-wide research, we provide brief summaries of those efforts including those by: the BLM along the Upper Big Wood River in the Shoshone Field Office (IDFG Region 4) and the main stem of the Snake River in the Upper Snake Field Office (IDFG Region 6); IDFG on the Henry's Fork of the Snake River in Region 6; and the US Fish and Wildlife Service (USFWS) along the Portneuf River near Pocatello (IDFG Region 5). Cumulatively, we detected Yellow-billed Cuckoos 37 different times (36 detections by IBO researchers and one detection on the canoe survey route conducted by IDFG), which almost certainly included repeat detections of individuals. Conservatively, we estimate that these detections represent approximately 13–16 total individuals: 1 in Region 4, 9–10 in Region 5, and 3–5 in Region 6. Based on repeated detections throughout the season, we suspect there are at least three breeding pairs in Region 5. At a survey site with a detection in Region 6, we were unable to return for visits 3 and 4 due to access issues, and a breeding pair at that location is also possible.

Our survey results, combined with detections from historic surveys, suggest that the Yellow-billed Cuckoos are rare, but do occur regularly at some locations across a broad spatial scale in southern Idaho, and there are areas that likely support breeding cuckoos. Continuing standardized surveys for cuckoos throughout Idaho to establish baseline data for cuckoo occurrence will provide data that can be used to model cuckoo habitat associations, and along with continued monitoring of cuckoo occurrence, habitat modeling for Idaho is one of the ultimate project objectives. To aid conservation and management efforts, we also suggest future Yellow-billed Cuckoo work in Idaho include the study of insect populations and how these may drive cuckoo occurrence, examining the loss of large cottonwood galleries across the breadth of cuckoo habitat, and targeting key areas for habitat restoration.

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GENERAL INTRODUCTION

The western population of Yellow-billed Cuckoo (*Coccyzus americanus*) is considered distinct from cuckoos inhabiting the eastern and central United States. Due primarily to extensive loss of multi-layered riparian habitats throughout the arid West, this Distinct Population Segment (DPS) is currently listed as Threatened under the Endangered Species Act. The final listing rule was published on October 3, 2014 and the listing went into effect November 3, 2014 (Halterman et al. 2015). In May of 2017, the USFWS received a petition to delist the western DPS of Yellow-billed Cuckoo and it prompted a 12-month status review for the species (USFWS 2018). Further, a five-year review was initiated at the same time for 50 species, including Yellow-billed Cuckoo. Concurrent to the above petition, the USFWS was also petitioned on the basis that critical habitat was not designated for Yellow-billed Cuckoo. The 12-month status review finding from the former petition was due in August of 2019, but as of the finalization of this report, no publication was available. The deadline for publication of the latter, the Proposed Critical Habitat and Designation of Critical Habitat, is February of 2020 and it is currently in review. Challenges to the federal listing status are ongoing and will likely continue. In Idaho, meanwhile, Yellow-billed Cuckoos are designated Species of Greatest Conservation Need (IDFG 2017).

Yellow-billed Cuckoos breed within mature cottonwood forests with an understory of willow or other deciduous shrubs (Johnson et al. 2017). Larger habitat patches, 80 hectares or more in extent within arid or semiarid landscapes, are almost always required for breeding, but cuckoos will nest in areas as small as 20 hectares (Hughes 1999, McNeil et al. 2013). Narrow, linear riparian strips less than 20 m wide are not thought to be used for nesting. However, these areas can provide foraging habitat and single adults have been observed in small patches during migration or foraging in these patches during the breeding season, as long as they are not spatially distant from more extensive habitat patches (Laymon and Halterman 1989, Halterman et al. 2015).

Cuckoos are secretive, dispersed widely across the landscape in large home ranges, prefer dense vegetative habitat, and Idaho is the northern extent of their range in the West (Reynolds and Hinckley 2005, Halterman 2009, Halterman et al. 2015). Unlike songbirds, they vocalize infrequently when not solicited, with rates as low as one call per hour (Reynolds and Hinckley 2005, Halterman 2009). Furthermore, local populations can exhibit large fluctuations in relatively short time periods. For example, a population on the South Fork Kern River in California grew from five to over 20 pairs in a 12-year period (Laymon et al. 1997) and a population on the San Pedro River in California halved in size from 2003–2006 and then doubled in just one year, from 2006–2007 (Halterman 2008). In Idaho, cuckoo populations may fluctuate based on the availability of large insects in the southern extent of their range; i.e., if habitat and food are prolific in the south, there might be fewer cuckoos in Idaho and vice versa (Matt Johnson, pers. comm.). Taken together, this makes cuckoos extremely difficult to detect in the wild, and particularly in Idaho.

Although cuckoo distribution and population size in Idaho is somewhat uncertain, the most extensive cuckoo habitat in the state occurs in the Upper Snake River Basin of eastern Idaho and over half of historic cuckoo records in Idaho come from this region (Reynolds and Hinckley 2005). Historic sightings in central Idaho are less common, but include an observation of a cuckoo in 1997 at the Hayspur Fish Hatchery and a mixture of visual and aural observations in 2001, 2003, 2004, 2009, and 2015 along the Big Wood River near Stanton Crossing (Reynolds and Hinckley 2005, eBird 2012). In 2009, a cuckoo was observed during an avian survey along the Big Wood River east of the Richfield Diversion Dam and south of the Magic Reservoir (Carlisle and Ware 2010). In 2017, a cuckoo was heard (eBird 2017) on the Little Wood River south of the Little Wood River Reservoir, but never detected during a formal survey. There are records for southwest Idaho, most recently in 2015 along the Boise River from a four-day stretch of surveys conducted by the US Army Corps of Engineers (USACE 2015), but extensive loss of riparian habitat in the region is thought to have limited cuckoo occurrence to primarily migrating and transient individuals in this part of the state (Reynolds and Hinckley 2005).

Since 2017, standardized surveys for Yellow-billed Cuckoos have been conducted across an ever-expanding area, with funding from the BLM Shoshone Field Office and IDFG (Section 6 funding, USFWS). In 2018, the Intermountain Bird Observatory and IDFG conducted the most thorough, standardized survey effort in Idaho to date. Prior to these efforts, Reynolds and

Hinckley (2005) completed surveys across the state from 2003 through 2005, but focused on areas with historic detections, and but comparing effort between those surveys and those by IBO are difficult because they did not explicitly state the number of sites or survey points visited. Our surveys encompassed moderately to highly suitable habitat in IDFG regions 4, 5 and 6, including proposed critical habitat, and resulted in 31 total detections. Based on knowledge of cuckoo spatial requirements, timing, and in-field observations, the 2018 detections were thought to represent a total of 11 to 13 individual cuckoos, mainly concentrated in IDFG Region 5 (Regan and Carlisle 2018). In 2019, the Intermountain Bird Observatory and Idaho Fish and Game completed the second year of formal surveys for IDFG and expanded into Region 3 (new for IBO). Other entities completed surveys in IDFG Regions 4, 5, and 6 and we further detail all known Yellow-billed Cuckoo research efforts within this report, categorized by IDFG Region.

OBJECTIVES

The Intermountain Bird Observatory and Idaho Department of Fish and Game conducted surveys for Yellow-billed Cuckoos within IDFG Regions 3, 4, 5, and 6 across as much potentially suitable riparian habitat as could be surveyed using standardized methods in the summer of 2019 (Figure 1). The goals of these surveys were to continue examining where Yellow-billed Cuckoos occur, how many individuals may be using these areas annually, and to obtain data on presence/absence of cuckoos to inform more comprehensive modeling of cuckoo habitat across the state of Idaho. Specifically, project objectives included:

1. Conduct a second season of standardized surveys for Yellow-billed Cuckoos in potentially suitable habitat in IDFG Regions 4, 5, and 6 with an additional survey in Region 3.
2. Obtain GPS coordinates for all survey locations, noting both presence and lack of detections of cuckoos.
3. Collect standardized vegetation data and photos at each survey site.
4. Collect data on cuckoo occurrence in the Shoshone Field Office at as many sites as resources allow to compare to the same sites surveyed in 2017 and 2018.

GENERAL METHODS

We followed recommendations of the Western Yellow-billed Cuckoo Working Group for site selection and survey protocol (Halterman et al. 2015). We selected from a pool of survey sites delineated using a cuckoo habitat model for southern Idaho (Johnson et al. 2017) as well as consultation with IDFG biologists. Johnson et al.'s (2017) preliminary habitat model designated Yellow-billed Cuckoo habitat with probability breakdowns of the likelihood of cuckoo occupancy in 10% increments. Most survey sites we selected were in the range of 40–90% likelihood. In 2019 we focused on revisiting sites with cuckoo detections in 2018 or historically, dropped 2018 sites with unsuitable habitat or for which we lacked the permission or ability to access, and added new sites from the broader pool of sites that had moderate to highly suitable habitat.

Yellow-billed Cuckoo surveys for determining bird presence are intensive. The protocol includes three survey periods, during which four visits are made: one visit during Survey Period 1 (June 15–June 30), two visits during Survey Period 2 (July 1–July 31), and one visit during Survey Period 3 (August 1–August 15). Thus, a total of four surveys, on separate visits, are conducted during those three periods. Cuckoos may breed at any point from June 15 to August 15 but have an accelerated nesting biology of only ~17 days from onset of incubation to fledging (Halterman 2015). To reduce the likelihood that a breeding attempt is missed, in addition to falling within the correct survey periods, visits are spaced 12–15 days apart. This allows researchers, with reasonable confidence, to ascertain presence of breeding cuckoos. For example, if a cuckoo is only detected during the first survey period, but not again later in the season, the bird is more likely migrating than breeding. We adhered as closely as possible to the suggested visit schedule of one visit every 12 to 15 days and ± 3 days for the beginning and end of each survey period. However, due to limited survey logistics, weather, and survey site access, there were cases in which consecutive visits were separated by slightly more or slightly less than the 12–15 day window. In each of these cases, we still conducted the visits within the recommended date range. We were unable to conduct four total visits at one site in Region 6 due to access issues, and at Deer Flat in Region 3 due to adding the site after the first survey window ended.

We began surveying at or just before sunrise and continued until we had completed entire or multiple survey sites, finishing all surveys by 1100. Generally, our survey sites were linear, followed a riparian corridor, and conducted from the perimeter of each site due to narrow patch

width or access issues as well as extremely dense vegetation and flooding in some areas. Additionally, surveying from the outside edge of a patch can aid chances of visual detections if surveyors are not surrounded by dense vegetation that limits visibility. When survey sites were wider than ~200 m and site access allowed, we surveyed from the interior of site patches. We conducted broadcast-call surveys at points located 100 m apart, although sometimes this distance varied slightly due to flooding and dense vegetation. Each broadcast sequence was a total of six minutes and consisted of one minute of silent listening followed by a broadcast of five contact call sequences each spaced one minute apart. If we detected a cuckoo, we immediately stopped playing the broadcast call and recorded the estimated distance to the cuckoo, the compass bearing to the cuckoo, the broadcast period in which the cuckoo was detected in (1–5), time of detection, type of call, and behavior during the observation. Subsequent to each detection, the next survey point was relocated 300 m from the point where the previous detection occurred to minimize likelihood of detecting the same cuckoo within a single survey area. In cases where it was evident that despite moving 300 m from the previous point, the same cuckoo was following observers for three or more broadcast calls, we discontinued the survey to avoid unnecessary disturbance.

We developed and implemented a more detailed vegetation collection protocol than what is suggested in Halterman et al. (2015). Our protocol characterizes the dominant species, species composition, and structure of the overstory and understory within survey patches. Because, in general, woody vegetation does not change very much within 100 m at our survey sites or within the span of the field season, we did not collect vegetation at every point, nor did we repeat measurements within the season. Instead, to allow for an approximation of overstory and understory vegetation across the entire survey area, we collected vegetation at every third point in smaller patches (≤ 10 survey points) and every fifth point in larger patches (> 10 survey points). In 2019, we collected measurements on the second visit to allow more time for route establishment during the first visit. This timing also allowed us multiple chances to correct vegetation measurements in case of accidental data errors or omissions. We used a 50 m radius as our vegetation survey area and modified this to a semi-circle if the survey point was on the edge of a delineated survey site. In effect, all our vegetation measurements represented the characteristics of the delineated cuckoo survey polygon, and not adjacent habitat. Because

presence of native vegetation adjacent to the surveyed site may be an important component of cuckoo occupancy, future vegetation surveys will include collection of adjacent habitat data.

To link vegetation data to the appropriate site, we recorded basic site information including the site name and observers present when the vegetation measurements were collected. We began and ended each survey transect by recording the time, ambient air temperature (Fahrenheit), percent cloud cover, precipitation (none, light, medium, heavy), and wind speed (Beaufort scale). At each point where we collected vegetation information, we also took a photo with the goal of capturing an image that represented a “typical” view. Photos could be taken in the observer’s choice of direction, as long as the lighting was not negatively impacting photo quality (e.g., we avoided taking photos where vegetation would be backlit or otherwise indistinguishable). We noted other information that could be relevant to cuckoos, including (but not limited to) the degree of cottonwood senescence and descriptions of unsuitable habitat patches.

We also included basic characteristics of the overstory and understory vegetation in our measurements. We defined overstory as any woody vegetation ≥ 3 m in height and understory as woody vegetation < 3 m (Hanni et al. 2018). For both overstory and understory, we collected data on species, percent cover, and average height in meters (Hanni et al. 2018). We identified up to five (depending on how many species were present) of the top overstory and understory species based on their percent cover. For our data collection, we recorded species using two-letter codes as in Hanni et al. (2018), but species name could be written instead. We grouped by genus or broader categories if there were many similar-appearing species (e.g., willow, cottonwood, and gooseberry). For percent overstory and understory, we used a visual estimate using the idea that cover equals the amount of shadow cast on the ground when the sun is directly overhead (Hanni et al. 2018). If a tree or shrub exceeded 3 m in height, we considered the entire tree or shrub overstory, even if there were branches below 3 m. We recorded the number of snags, completely dead trees with > 6 ” DBH, within 50 m of our survey point, to help capture the level of senescence of cottonwoods in each survey polygon. For each species, we recorded the percent of the overstory or understory comprised by that species, such that the total added to 100%. We used 5% increments, but for trace amounts, used 1% and reduced the percent cover of the most dominant species. If we recorded any snags, we included a “dead deciduous” or “dead conifer” category in the species composition. For overstory, we estimated height in 1 m increments and

for understory we used 0.25 m increments. Both were weighted by the proportion of overstory at different heights. For example, if there were two layers to the overstory we estimated the height of the taller layer and the lower layer; and then weighted the average of those two numbers to reflect which overstory-height layer was more dominant. We also recorded whether surface water (any standing water on the ground) or saturated soil was present within 300 m of our survey point.

We documented all other avian species detected by sight or aurally, and, when surveys were on publicly-owned land, submitted eBird checklists (<http://ebird.org/content/ebird/>) specific to each survey site at the end of the morning survey window. This data was not collected during the formal broadcast surveys but rather when surveyors were moving between points and throughout the survey when it made sense to record the data. Our datasheet leaves space for surveyors to record other avian species if they so desire. This data provides additional information on bird communities in riparian habitats that cuckoos may use.

Most survey sites occurred on BLM or other publicly accessible land. However, we did have a subset of sites that required private landowner permission for access and surveys and some in Region 6 required jet boats to access the survey sites. In Region 5, we reached almost all survey sites via kayak. Volunteers joined trained technicians for surveys in accessible and suitable terrain, primarily in Regions 4 and 6. Because a USFWS permit is required to conduct broadcast call surveys for species listed under the Endangered Species Act, only biologists that had attended a cuckoo-specific training were authorized to conduct surveys (Permit Number: TE22702C-0).



Picture 1. Participants surveying for cuckoos at formal Yellow-billed Cuckoo training led by Tempe Regan and Becky Abel of IDFG. Photo by Tempe Regan.

GENERAL RESULTS

We surveyed sites with a combination of historic Yellow-billed Cuckoo survey efforts and detections as well as new areas along the southeast edge of Lake Lowell at Deer Flat NWR in Region 3, the Big Wood River and Magic Reservoir in Region 4, the Snake River upstream of American Falls Reservoir in Region 5, and the main stem, Henry's Fork, and South Fork of the Snake River in Region 6. Using a standardized protocol, we conducted four repeat surveys (when logistics and private land access allowed) of 1, 5, 23, and 34 distinct survey sites in Regions 3, 4, 5, and 6, respectively. Other entities surveyed an additional three sites along the Upper Big Wood River in Region 4 (BLM), one site along the Portneuf River in Region 5 (USFWS), one site along the main stem of the Snake River in Region 6 (BLM), plus the portion of the Henry's

Fork Canoe Survey Route between Red Road Access and Warm Slough also in Region 6 (IDFG). Cumulatively, we detected Yellow-billed Cuckoos 37 different times (36 detections by IBO surveyors and one detection on the canoe survey route conducted by IDFG), which almost certainly included repeat detections of individuals. Conservatively, we estimate that these detections represent approximately 13–16 total individuals: 1 in Region 4, 9–10 in Region 5, and 3–5 in Region 6 (Figure 2).

GENERAL CONCLUSIONS and RECOMMENDATIONS

Although our surveys in 2019 were as spatially comprehensive in Regions 5 and 6 as in 2018, they were more limited in extent in Regions 3 and 4, and still relatively limited in temporal scope. As a species, cuckoos are known to be spatially and temporally dynamic, and therefore to fully understand status and distribution, many years of surveys are needed. That said, information on Yellow-billed Cuckoo occurrence is an important starting point for answering basic ecological questions. Thus, we recommend continuing standardized surveys for cuckoos throughout potentially suitable habitat in southern Idaho to establish baseline data for cuckoo occurrence. Ideally, this occupancy research would occur in coordination with other survey efforts throughout the range of the western distinct population segment and, if there is sufficient information, then lead to exploration of deeper questions.

In 2019, we built on collaborations and partnerships between BLM, IDFG, USFWS, and IBO which continued to enhance our ability to collect quality data from a wide spatial scope. A multi-organizational working group for Yellow-billed Cuckoo monitoring across the state of Idaho has met in 2018 and 2019 and some of the outlined priorities are beginning to come to fruition. These draft priorities include continuing to gather baseline survey data in southern Idaho, as mentioned above, as well as research on prey populations that might support cuckoos, potential monitoring of nest success, and prioritizing areas for habitat restoration. For example, research examining insect population cycles could provide information on how these may drive Yellow-billed Cuckoo distribution across different years in southern Idaho, something other studies suggest may occur within the cuckoo's range (Laymon 1980, Koenig and Liebhold 2005, Halterman 2009, McNeil et al. 2013).

Finally, several areas may present ideal opportunities for cuckoo habitat restoration based on important factors such as presence of surrounding native vegetation, consistent annual water

supply, and already existing, if limited, patches of habitat. Across the breadth of our 2019 survey sites, we detected Yellow-billed Cuckoos in sites with historic detections. As cuckoos are long-lived birds in the wild (up to 7+ years; M. Johnson, pers. comm.) the ongoing presence of cuckoos at similar locations could indicate site fidelity or also indicate that subsequent generations of cuckoos have been using the same historic sites over time. These areas with repeat detections across years may warrant further in-depth monitoring and could hold promise for habitat restoration. One area with potential for restoration, suggested in IBO's 2018 report, is located just south of the Richfield Diversion Dam in Region 4. Cuckoos have been detected here in 2009 and 2017, sparse stringers of cottonwoods already exist, the water supply is stable, and there is extensive BLM land adjacent to the site. This year, there was further communication between BLM, IDFG, and IBO about that area in regard to potential cuckoo habitat restoration and expansion, and we hope to see efforts continue to evolve. Nearby, west of Hailey, the Walla Walla District Corps of Engineers is in the developmental stages of a habitat rehabilitation project on the Big Wood River.

OVERVIEW OF 2019 SURVEY EFFORTS ACROSS SOUTHERN IDAHO

Each chapter in this report pertains to a different region designated and administered by the Idaho Department of Fish and Game (Figure 1). In Region 3, our survey effort was limited and there was only one site. In Region 4, the BLM provided partial funding for surveys that IBO conducted on BLM land in addition to completing their own surveys at three other sites in the Shoshone Field Office. The section of this report dedicated to Region 4 includes results from surveys conducted by IBO and BLM. Likewise, in Region 5, USFWS conducted a survey along the Portneuf River, and in Region 6 both BLM and IDFG collaborated with IBO to complete surveys. We report any region-specific information in the introduction, methods, results, and discussion within each chapter; however, the general methods and the general introduction above apply to each region and should be referred to as needed.

Figure 1. Overview of 2019 statewide Yellow-billed Cuckoo surveys including all known efforts by IBO, IDFG, BLM, and USFWS.

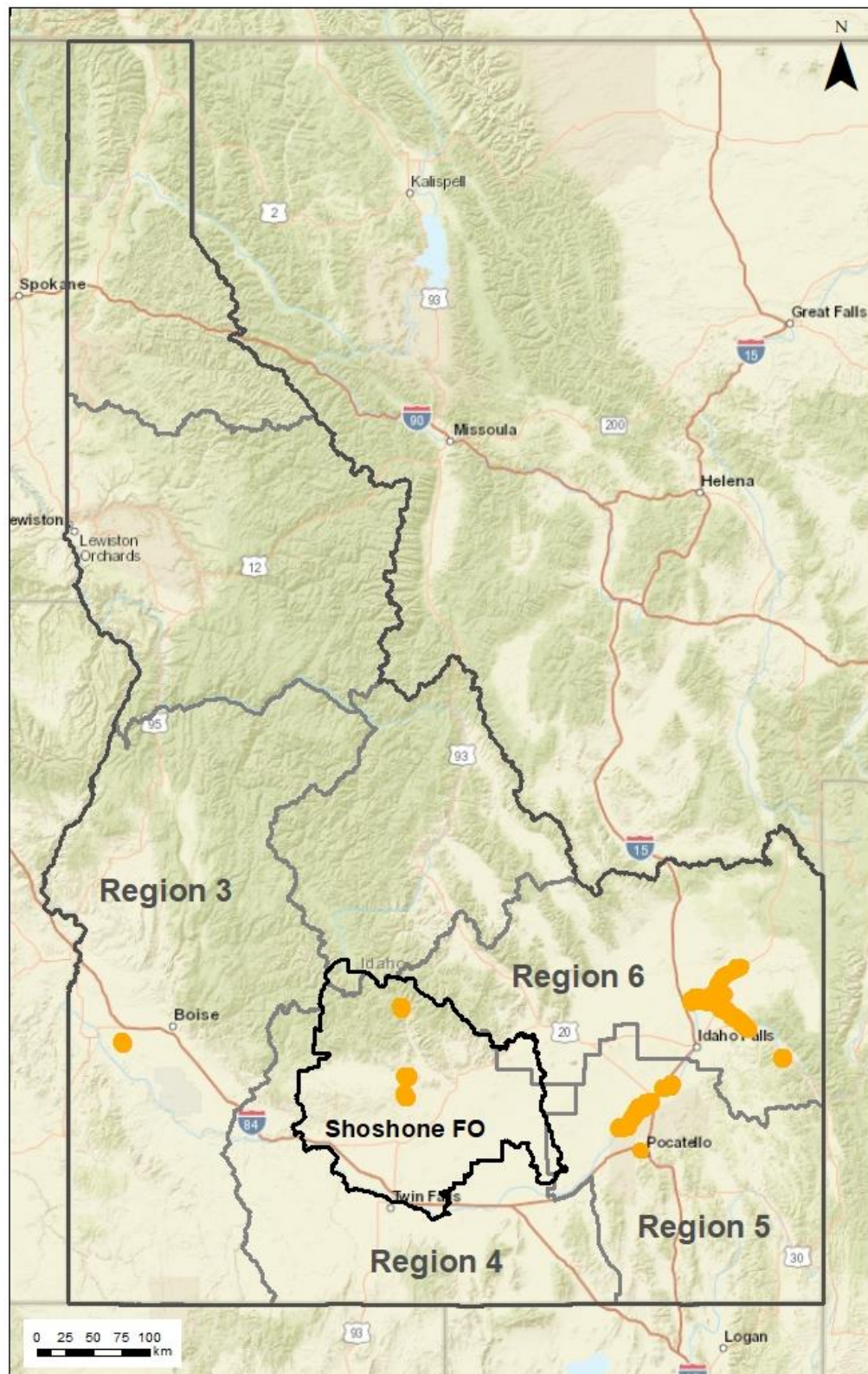
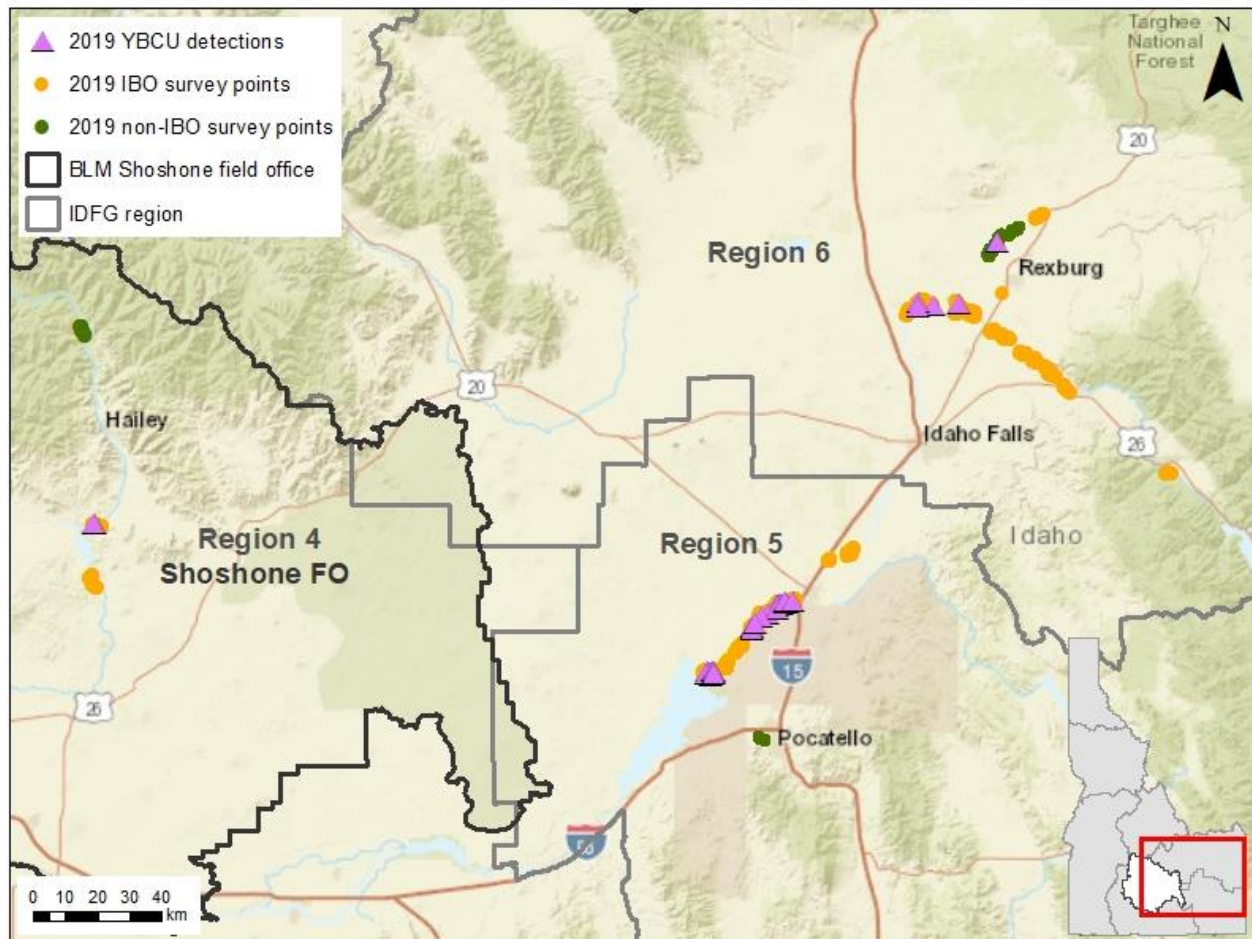


Figure 2. Survey sites and locations of Yellow-billed Cuckoo detections in IDFG Regions 4, 5, and 6 and BLM Shoshone Field Office which overlaps with Region 4. There were no detections in Region 3, and we exclude that portion of the survey effort for easier viewing.



REGION 3

ABSTRACT

We conducted breeding season surveys for Yellow-billed Cuckoos in Region 3 at Deer Flat National Wildlife Refuge (NWR) from July 11 – August 8, 2019. We were asked to add this survey after the first survey window had passed and had time to complete three rounds of surveying 18 points at the southeast edge of Lake Lowell. Our survey points were the same as 2018 IDFG survey points, but we extended the survey northward by adding three additional points. In 2018, survey efforts at Deer Flat NWR were conducted independently by IDFG and not included in last year's report, but they were in coordination with IBO surveys. This area is not within USFWS Proposed Critical Habitat and we did not detect any cuckoos. Our survey results do not indicate cuckoos were breeding here in 2019. However, it has been suggested that western Idaho provides stopover habitat for migratory cuckoos, and because we missed the first survey window, migrants stopping at Deer Flat NWR would likely have gone undetected.

INTRODUCTION

Region 3 generally lacks the extensive and wide riparian habitats utilized by breeding cuckoos and as such there is no USFWS Proposed Critical Habitat within its bounds. While the region likely does not host breeding Yellow-billed Cuckoos, the riparian habitat that is present is thought to be important for migration stopovers and maintaining connectivity with areas where cuckoos breed (Reynolds and Hinckley 2005). The vegetation at the survey site consisted primarily of cottonwood (*Populus spp.*), willows (*Salix spp.*), green ash (*Fraxinus pennsylvanica*), Russian olive (*Elaeagnus angustifolia*), and smooth sumac (*Rhus glabra*) in the overstory, and willows (*Salix spp.*), smooth sumac (*Rhus glabra*), Russian olive (*Elaeagnus angustifolia*), wild rose (*Rosa spp.*), and American elm (*Ulmus americana*) in the understory.

Historic cuckoo detections in Region 3 have been sporadic and rare (Figure 3) and are generally believed to have been transient birds (Reynolds and Hinckley 2005). In the Boise area along the Boise River, there were cuckoos reported in 1999, 2000, and 2015. The reports from 2015 were thought to represent two individual cuckoos, detected during a four-day stretch of official surveys in June (USACE 2015). There were also two cuckoos observed at the Fort Boise

Wildlife Management Area in 1978, and in June of 1985 a cuckoo was detected at Swan Falls Dam. There may historically have been more suitable habitat at Swan Falls Dam and Fort Boise Wildlife Management Area than there is today (Reynolds and Hinckley 2005). We surveyed at Deer Flat NWR because there is potential habitat, a historic detection from the summer of 1978 at Lake Lowell (Reynolds and Hinckley 2005), and to continue long-term monitoring; Reynolds and Hinckley (2005) surveyed the site in 2003, and IDFG surveyed in 2017 and 2018.

METHODS

We conducted target playback surveys for Yellow-billed Cuckoos, using standardized methods (see General Methods section above), at one site, Deer Flat NWR (Figure 2). We completed surveys on July 11, July 24, and August 8, respectively, and visited all 18 points each time.

RESULTS and DISCUSSION

We surveyed at 18 points at one site in Region 3 for a total of 54 individual surveys. We did not detect Yellow-billed Cuckoos at any survey points. Because Region 3 is believed to support migrating, transient, or dispersing cuckoos rather than breeding cuckoos (Reynolds and Hinckley 2005), the timing of our first visit (survey window 2 versus survey window 1) was not ideal for capturing pre-breeding season movements. While there is a small section of habitat that could be suitable for cuckoos, adjacent lands are primarily agricultural or developed and it is unclear what foraging opportunities would be available to cuckoos. Despite the low likelihood of cuckoos breeding in Region 3, we recommend continuing surveys when funding and time allow, in order to build understanding of potential stopover locations for cuckoos that do breed in Idaho.

Figure 3. An overview of historic Yellow-billed Cuckoo detections from Region 3 in southwest Idaho.



REGION 4

ABSTRACT

We conducted breeding season surveys for Yellow-billed Cuckoos in riparian areas with moderately to highly suitable habitat across Region 4 in Idaho from June 15–August 3, 2019, with much of the effort concentrated in the Bureau of Land Management Shoshone Field Office (Figure 4). Our main objective was to survey the best potential cuckoo habitat at as many sites within this region that funding would allow. IBO conducted four repeat surveys in five distinct sites along the Big Wood River near Stanton Crossing and Magic Reservoir, and BLM conducted four repeat surveys at three distinct sites along the Upper Big Wood River north of Ketchum (Figure 4). All sites we surveyed in 2019 were also surveyed in 2018, with focus on locations where there were past cuckoo detections. We detected a Yellow-billed Cuckoo at one site in 2019: the north side of the Proposed Critical Habitat along the Big Wood River (Figure 5). Survey results suggest that the Yellow-billed Cuckoos do occur in this area and some large areas of habitat could support breeding cuckoos. However, our survey results since 2017 do not provide substantial evidence of breeding cuckoos this season in Region 4. Habitat in Region 4 could still be important for cuckoo life history including during breeding and migration, and we suggest that habitat restoration could maintain and improve important areas for cuckoos in this region as part of the greater mosaic of cuckoo habitat across Idaho.

INTRODUCTION

Region 4 contains a small section (~4.3%) of the total US Fish and Wildlife Service Proposed Critical Habitat in Idaho, as well as other potentially suitable areas of riparian habitat for Yellow-billed Cuckoos. This section of Proposed Critical Habitat, located along the Big Wood River, is separated by roughly 135–182 km from the other sections in eastern and southeastern Idaho along the Henry's, South Fork, and main stem of the Snake River. This section, and the majority of surveys sites in Region 4, are unique from other sections of Idaho's Proposed Critical Habitat in that the riparian zone and cuckoo habitat is surrounded by a continuation of natural habitat (native sagebrush, forbs, and grasses) instead of agricultural lands that are typical of Snake River survey sites in eastern and southeastern Idaho. The riparian

vegetation is comprised primarily of black cottonwood (*Populus balsamifera ssp. trichocarpa*) overstory, with willows (*Salix spp.*), red osier dogwood (*Cornus sericea*), gooseberry (*Ribes spp.*), quaking aspen (*Populus tremuloides*), and snowberry (*Symphoricarpos spp.*) in the understory.

Historic sightings of cuckoos in Region 4 include an observation of a cuckoo in 1997 at the Hayspur Fish Hatchery and a mixture of visual and aural observations in 2001, 2003, 2004, 2009, and 2015 along the Big Wood River near Stanton Crossing (Reynolds and Hinckley 2005, eBird 2012; Figure 6). In 2009, a cuckoo was observed during an avian survey along the Big Wood River east of the Richfield Diversion Dam and south of the Magic Reservoir (Carlisle and Ware 2010). During our formal surveys in 2017, we also detected an individual cuckoo three times in one survey visit at a site near the Richfield Diversion dam, within a few hundred meters of the 2009 observation. Additionally, in 2017 a cuckoo was heard (eBird 2017) on the Little Wood River, south of the Little Wood River Reservoir, but never detected during a formal survey. In 2018, IBO detected cuckoos at in the Proposed Critical Habitat west of Stanton Crossing. The detections occurred on two different surveys on the north and south sides of the Big Wood River, and it is possible it was the same individual. In 2018 we also detected a cuckoo at three different survey points in the Upper Little Wood River 2 site (on private land) during the third visit.

Although the Intermountain Bird Observatory conducted three rounds of surveys in many potentially suitable areas in 2010, these were not derived from a habitat model. In 2017, we initiated the first large-scale monitoring effort across the extent of suitable habitat within the BLM Shoshone Field Office and continued those efforts in 2018. In 2019, we scaled-back efforts and selected sites to reflect funding levels and sources (BLM and IDFG funding), revisiting the Proposed Critical Habitat and Magic Reservoir sites. Additionally, the BLM continued some cuckoo surveys within their Field Office to augment previous survey years and data collected for them by the Intermountain Bird Observatory. These BLM surveys occurred at three sites along the Upper Big Wood River north of Ketchum. Unfortunately, some sites that had detections in previous years, including one along the Little Wood River that had a cuckoo detection in 2018, was not surveyed in 2019 due to lack of funding.

METHODS

We conducted target playback surveys for Yellow-billed Cuckoos, using standardized methods (see General Methods section above), at a total of eight (five by IBO, three by BLM) separate survey sites in riparian habitat along the Big Wood and Little Wood rivers (Figure 4). Six of the eight survey sites in Region 4 occurred outside of the Proposed Critical Habitat.

Our 2017 effort was funded by the BLM and our surveys focused within the Shoshone FO, which occurs almost entirely within Region 4. In 2018, with additional funding (from USFWS section 6, via IDFG), we re-surveyed all sites with suitable habitat from 2017 plus an additional five sites away from BLM land. In 2019, we surveyed a smaller subset of sites that included BLM land or had nearby cuckoo detections (non-BLM land surveys were funded through IDFG).



Picture 2. View into the cottonwood gallery of the Proposed Critical Habitat North (Stanton Crossing North) site minutes after a 2019 cuckoo detection. Photo by Stephanie Coates.

RESULTS and DISCUSSION

IBO surveyed a total of 75 survey points at 5 sites for a total of 300 individual surveys (excluding discrepancies when cuckoos were detected). The BLM surveyed an additional 25 survey points at 3 sites for a total of 100 individual surveys. Cumulatively, we detected Yellow-billed Cuckoos at two of the survey points (2.0%), 0.5% of the 400 individual surveys, and these represented one site overall (12.5%; Figure 5).

On 17 June 2019, while conducting the first visit at the Proposed Critical Habitat North site, we had our first and last Yellow-billed Cuckoo for the season in Region 4. At 0914, the cuckoo flew out from midlevel in the cottonwood canopy and circled over the observer. An American Robin mobbed the cuckoo as it flew back into the trees. We did not hear vocalizations by the cuckoo prior to the sighting. The observer turned off the broadcast call and watched until the cuckoo disappeared into the foliage shortly after returning to the trees. Two survey points following the gap of 300 m from the cuckoo detection point, the observer heard a distant cuckoo contact call in the direction of the last point. Based on the timing and direction, we suspect it was the same individual. However, the presence of a second bird cannot be ruled out. We did not detect a cuckoo at this site or at the southern side of the Proposed Critical Habitat for the rest of the season, despite the habitat being contiguous and .

As noted previously, there have been infrequent, but somewhat consistently located cuckoo detections in Region 4 (Figure 6). Similar to the cuckoo detection this season, there was also one, or possibly two, cuckoos detected in the Proposed Critical Habitat in 2018. Further, there are historical records from the Stanton Crossing/Mahoney Flat area also within the Proposed Critical Habitat (Reynolds and Hinckley 2005) and the riparian habitat in this area appears suitable for breeding cuckoos as it supports a cottonwood overstory with a dense understory of willow, dogwood, and other shrubs. There were no cuckoo detections at other sites in Region 4, including at Magic Reservoir South 1 where there was a single cuckoo detected in 2017 (Regan and Carlisle 2017) and in 2009 (Carlisle and Ware 2010).

Based on timing within the season, it is possible that our 2019 detection in the Proposed Critical Habitat included a newly arrived migrant that decided to settle in that area for the duration of the summer. Although we did not detect cuckoos during the following three visits, from either side of the river, several factors interfere with and impede detectability at this site. First, the Proposed Critical Habitat is a large swath of quality cuckoo habitat, both in width and

length, and from most points we are surveying from the outside edge of the habitat patch and broadcasting inward. This survey method is driven by the fact that there is usually flooding and high water during visits one, two, and potentially visit three in some years that prevent or make access dangerous. In addition, mixed ownership of the land can also complicate access. Thus, although we feel we are choosing the best way to thoroughly survey this area, future efforts to explore alternative routes could continue. In 2018, during the fourth visit we surveyed down the river corridor itself in an attempt to scout new routes. Although this route was feasible to survey during the latter part of the summer, it would not be possible earlier in the season because the river flow and volume make it unsafe and difficult to hear and stop at survey points, and this survey was not attempted in 2019. Second, Idaho State Highway 20 runs parallel to the Big Wood River on the north side of the Proposed Critical Habitat. Almost every survey was impacted by high traffic rates that made it difficult to hear. This was especially noticeable along the north side of the river, where the survey route follows the space between the highway and the river, which sometimes narrows to less than 30 meters. Although we generally tried to time surveys to avoid starting playbacks when vehicles were passing, this was nearly impossible and traffic volume was such that we may have missed a vocalizing cuckoo anyway. However, we chose to retain and complete these survey routes because, in addition to being Proposed Critical Habitat, this area is the largest continuous swath of high-quality cuckoo habitat in Region 4 and has numerous historic observations of cuckoos. Finally, access to some parts of this relatively large habitat patch is difficult or impassable; thus, cuckoos may move up or downstream into areas we are not covering.

Overall, the amount of suitable riparian habitat in Region 4 is quite small and may not be enough to support a sizable breeding population. Our only cuckoo detection in 2019 occurred during the first survey period and could have been a prospecting adult, but consistent detections at that site taken together with traffic noise that impedes detections suggest it is possible that cuckoos breed in the area in some years, likely dependent upon availability of large insect hatches (M. Johnson, pers. comm.). While limited in extent, the riparian habitats in Region 4, as well as on adjacent private lands, do provide potentially suitable habitat for breeding or migrating cuckoos, and there have been detections in 2017, 2018, and 2019. Further, in several areas there are either opportunities or plans underway for cuckoo habitat restoration. One such place with potential for restoration, suggested in last years' report, is just south of the Richfield

Diversion Dam in Region 4. Cuckoos have been detected here in 2009 and 2017, sparse stringers of cottonwoods already exist, the water supply is stable, and there is extensive BLM land adjacent to the site. Nearby, west of Hailey, the Walla Walla District Corps of Engineers is in the developmental stages of a habitat rehabilitation project on the Big Wood River. If or when these potential restoration projects are implemented, they could provide opportunities to monitor change in species occurrence over time as the habitat develops.

Figure 4. Locations of Yellow-billed Cuckoo survey sites throughout Region 4 and the BLM Shoshone Field Office showing USFWS Proposed Critical Habitat and sites surveyed in 2019 (all sites surveyed in 2019 were also surveyed in 2018). Ketchum 3, 4, and 5 were surveyed by the BLM in 2019. Two sites surveyed in 2018 but not 2019 were outside the scope of this map and not included here.

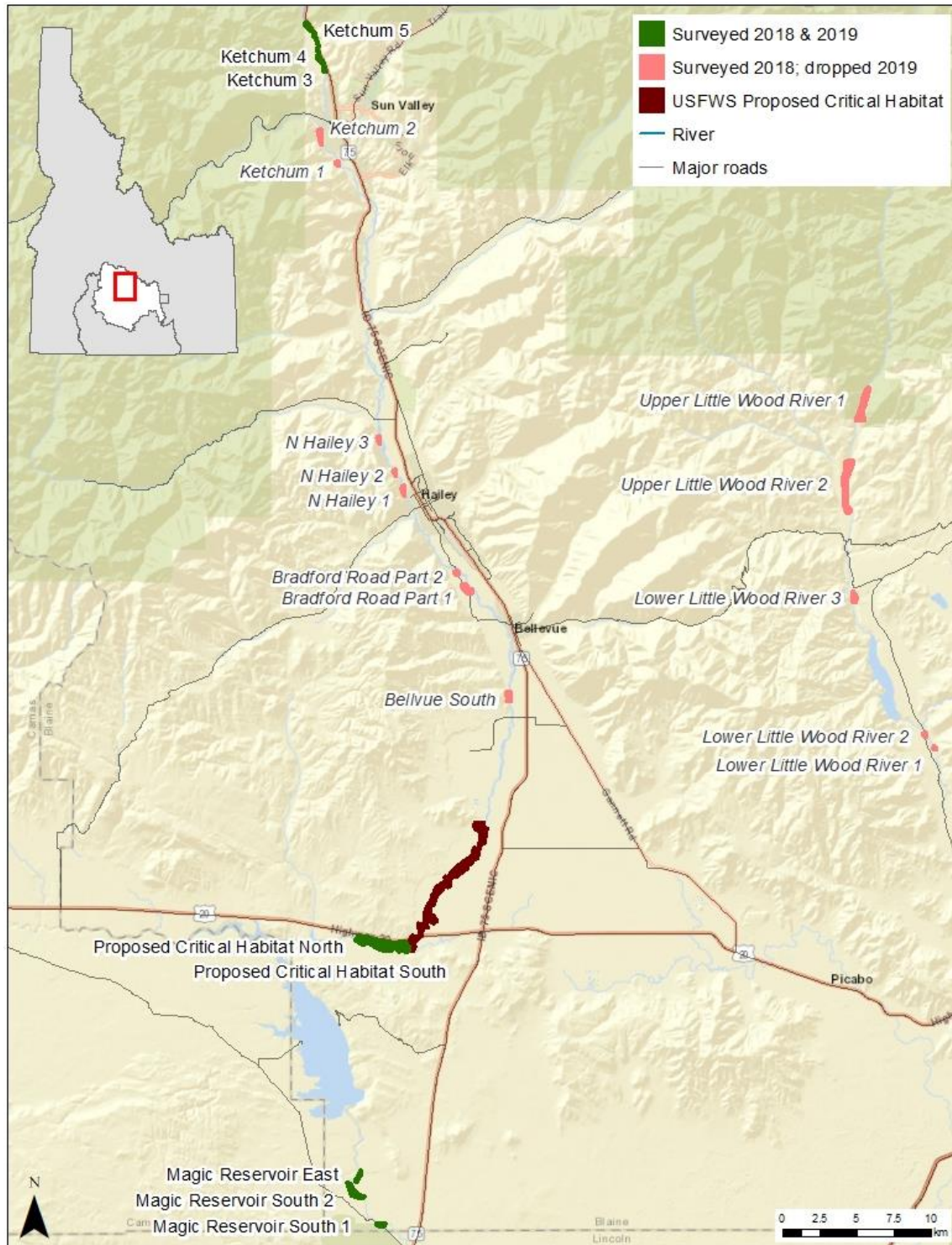


Figure 5. Region 4 and the BLM Shoshone Field Office Yellow-billed Cuckoo survey sites with and without cuckoo detections, showing USFWS Proposed Critical Habitat. Ketchum 3, 4, and 5 were surveyed by the BLM in 2019.

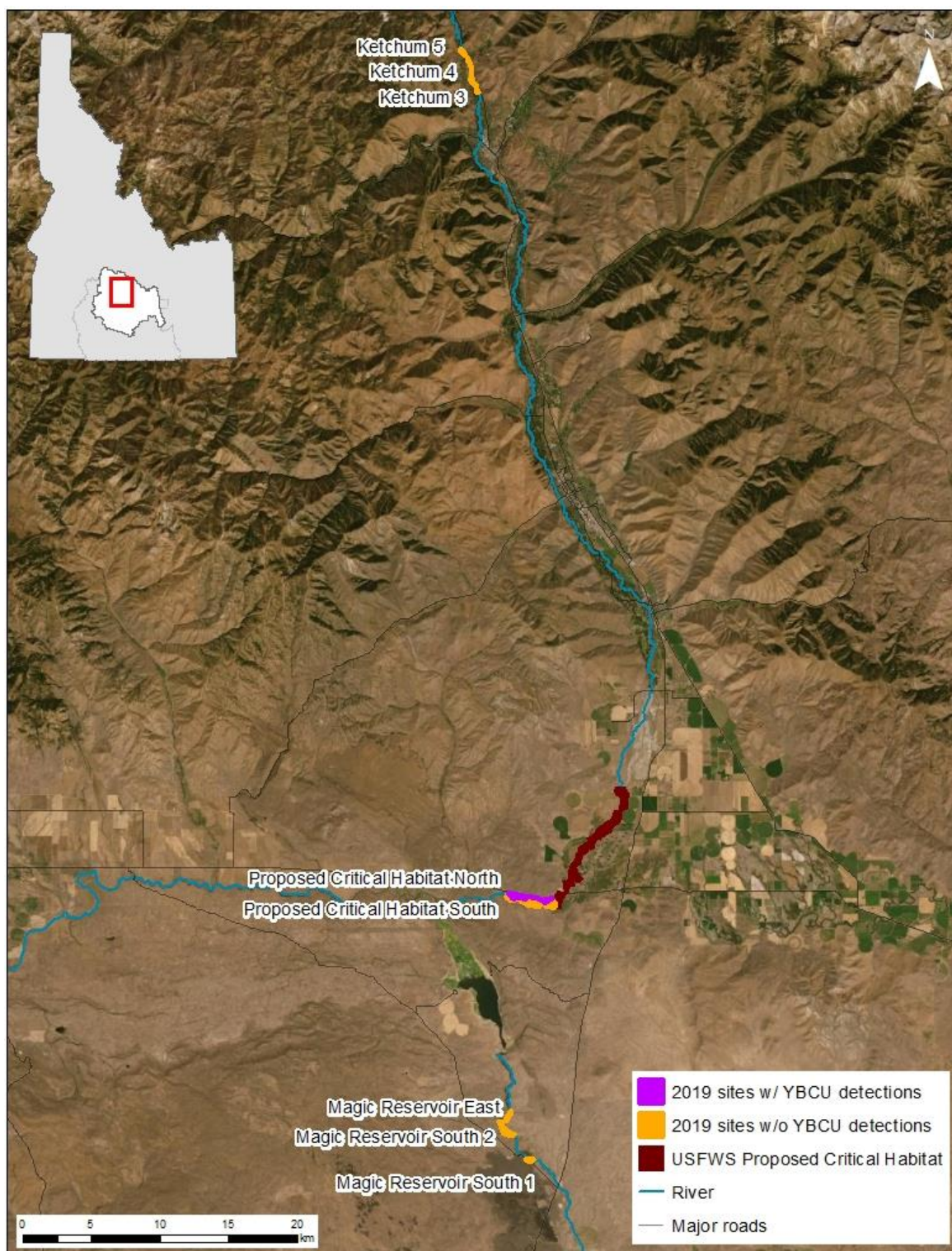


Figure 6. An overview of current and historic Yellow-billed Cuckoo detections from the main survey area of Region 4 and the BLM Shoshone Field Office.



REGION 5

ABSTRACT

We conducted breeding season surveys for Yellow-billed Cuckoos in riparian areas with moderately to highly suitable habitat along the Snake River in Region 5 from June 15–August 8, 2019. Our main objective was to survey the best potential cuckoo habitat within this region. We conducted four repeat surveys in 23 distinct survey sites. Overall, we surveyed 16 sites with historical Yellow-billed Cuckoo surveys, including those from 2018, and 7 new sites (Figure 7). Additionally, USFWS surveyed a ~2.2 km stretch of the Portneuf River. Cumulatively we detected Yellow-billed Cuckoos 30 different times (all detections by IBO surveyors), at 10 separate survey sites and one incidentally at Tilden Bridge boat ramp, throughout the entire survey season. We suspect there are breeding pairs at three sites – Snake River 2, McTucker Island, and Snake River 23 – because either a second cuckoo was detected during the same survey morning, or cuckoos were detected within a complex of survey sites near these in every survey period (Figure 8). In addition to sporadic surveys conducted from 2010–2012 by Idaho Fish and Game and Reynolds and Hinckley (2005) in 2002–2005, 2019 represents the second consecutive year of the most complete, standardized survey seasons across the breadth of cuckoo habitat in Region 5. Our survey results, combined with historical records, continue to suggest that Yellow-billed Cuckoos do occur in this area in consistent locations, and some areas of habitat likely support breeding birds on an annual basis. Thus, habitat in Region 5 is important for cuckoo life history including breeding and migration, and we suggest that continued conservation and restoration of habitat could maintain and improve suitability of this region as part of the greater mosaic of cuckoo habitat across Idaho and the range of the western DPS.

INTRODUCTION

Region 5 contains about 37% of all US Fish and Wildlife Service Proposed Critical Habitat in Idaho, as well as other potentially suitable areas of riparian habitat for Yellow-billed Cuckoos. This section of Proposed Critical Habitat is the southernmost in the state, 70 km south of northern sections within IDFG Region 6. It begins at Blackfoot, ID and follows the Snake River 30 km southwest, terminating at the American Falls Reservoir. The vegetation community

along this portion of the Snake River includes an overstory comprised primarily of narrowleaf cottonwood (*Populus angustifolia*) with some box elder (*Acer negundo*) and understory layers with a mix of Russian olive (*Elaeagnus angustifolia*), willows (*Salix spp.*), Rocky Mountain juniper (*Juniperus scopulorum*), skunkbush (*Rhus trilobata*), red osier dogwood (*Cornus sericea*), gooseberry (*Ribes spp.*), and snowberry (*Symphoricarpos spp.*). Agricultural fields surround almost all of the Proposed Critical Habitat in this region.

Region 5 has historically been one of the most consistent areas for Yellow-billed Cuckoo sightings from both formal surveys and incidental observations (Figure 9). During formal surveys in 2003, Reynolds and Hinckley (2005) detected cuckoos ten times on the main Snake <10 km north of American Falls Reservoir and had detections in this same stretch in 2004 and 2005. In 2005, Reynolds and Hinckley (2005) report observing a copulating pair at McTucker Creek and, based on observations of copulation and birds carrying nesting material, suggested cuckoos were breeding below Tilden Bridge, along the main Snake River, north of American Falls Reservoir in 2003–2005. Between 2010 and 2016, IDFG and BLM staff had nine detections of cuckoos in Region 5 (Abel 2016). In 2017, one cuckoo was detected on a formal survey at McTucker Island but from the irrigation canal road, rather than the island itself (Becky Abel, pers. comm.). In 2018, we surveyed 21 sites, detected cuckoos at five of those sites, and estimated there were a total of ~7–8 individual cuckoos in Region 5.

Although Reynolds and Hinckley (2005) and IDFG have conducted formal surveys sporadically within the last 15 years, these efforts did not always include all four surveys recommended by the USFWS protocol (Haltermann et al. 2015) for Yellow-billed Cuckoo surveys (Reynolds and Hinckley 2005, Cavallaro 2011, Abel 2016). In 2019, we continued large-scale monitoring efforts within Region 5 that were implemented in 2018.

METHODS

We conducted playback surveys for Yellow-billed Cuckoos, using standardized methods (see General Methods section above), at a total of 23 separate survey sites in riparian habitats along the Snake River, and one additional site along the Portneuf River that was surveyed by USFWS. Survey sites were a combination of those that had previously been surveyed by IDFG, BLM, and IBO biologists and new sites (Figure 7). Most survey sites in Region 5 were on BLM

or publicly accessible land. IBO surveyed 23 sites and USFWS surveyed 1 site in Region 5. All sites received a complete season of four repeated surveys. Of the 23 sites surveyed by IBO, there were 16 historical and 7 new sites (Figure 7). Two of the 23 sites were on private land and three other sites required coordination with a biologist from the Shoshone-Bannock Tribes Fish and Wildlife Department for access. All but four IBO survey sites and the USFWS survey site occurred within the Proposed Critical Habitat (Figure 8). Surveyors accessed all but two sites (Lavaside and Snake River 2) by kayak as this was the most feasible option. Both technicians would kayak to survey sites and either survey on foot or survey from the high water mark, depending on access. Although extremely high flows made the Snake River dangerous early in the season, we were able to complete all surveys in the first survey period. However, we did adjust and refine some survey routes during subsequent visits depending on river flow.



Picture 3. A Yellow-billed Cuckoo detected during a survey in Region 5. Photo by Erik Schoenborn.

RESULTS and DISCUSSION

IBO surveyed a total of 356 points for a total of 1318 individual surveys (excludes discrepancies when cuckoos were detected or when points and survey routes were adjusted due to access and refinement with changing water levels). Along the Portneuf River, USFWS surveyed 22 points at one site for a total of 88 individual surveys. IBO detected Yellow-billed Cuckoos on 28 of the total 1318 individual surveys (2%), at ~8% of all survey points, and at 11 different sites (48%). Two detections were during the same visit survey point and represented two different cuckoos. Several of the survey sites were in close proximity to each other and we suspect multiple detections of the same individuals from different, but nearby sites (Figure 8). Additionally, we detected two cuckoos incidentally between points within survey sites, and one at the Tilden boat ramp, outside of a designated survey. No cuckoos were detected along the Portneuf River. With the exception of Reynolds and Hinckley (2005), historical survey effort has been limited. However, IDFG did detect cuckoos in some years including: 2010 when IDFG surveyed one site and detected one cuckoo; 2012, when IDFG surveyed four sites and detected seven cuckoos; and in 2016 when one unsolicited cuckoo was detected (Abel 2016). During our thorough survey effort in 2018, we detected cuckoos 20 times at 5 of 21 sites.

At Ferry Butte South, which is within USFWS Proposed Critical Habitat, we detected a single cuckoo three separate times during visit 4 beginning at 0644 on August 7. We heard the cuckoo giving contact calls in response to the playback and initially it perched in a tree near the observer who recorded a video and took photos. Upon showing the photos to the technician who surveyed Ferry Butte South in 2018, the technician believed the cuckoo was perched in the exact tree as a cuckoo detected at the site in 2018. We made one incidental detection later the same day (August 7) of a cuckoo at the Tilden boat launch approximately 400 m upstream from the Ferry Butte South survey site. In 2018 we detected a pair during visits one and three at Ferry Butte South and though these observations strongly suggest occupancy by a breeding pair, we did not observed any additional evidence for breeding. Given the detection of a single cuckoo during the last visit, we cannot confirm that there was a breeding pair at Ferry Butte South in 2019, but it does continue to suggest that Ferry Butte South and the surrounding habitat is important for cuckoos.

We had multiple cuckoo detections at McTucker Island, Tiny Tucker 1, and Tiny Tucker 2, and because they are adjacent sites, we discuss them together here. All three sites are within

the USFWS Proposed Critical Habitat. Tiny Tucker 2 is farthest upstream and large enough that two technicians surveyed the site simultaneously along parallel transects while in communication with each other. We detected cuckoos a total of four times at Tiny Tucker 2. The first three detections were during visit 2 (July 3). Two detections were by one technician and based on the timing, location, and behavior of the cuckoos, he believed it was two separate individuals. The fourth detection occurred on visit 4 (August 2). The next site downstream of Tiny Tucker 2 is McTucker Island, which we surveyed in 2018 and detected cuckoos three times in total during visits 3 and 4 that year. This year, we had four detections at McTucker during visit 2 (July 1), all thought to be the same individual since the bird was either vocalizing from the same direction or flew in from the direction of the previous detections. After the third detection we moved 500 m because the cuckoo had followed twice before with gaps of 300 m. We ended the survey after the fourth detection, deciding it was best to minimize disturbance based on the assumption that all detections were the same individual. At Tiny Tucker 1, the farthest downstream of the three sites, we detected a single, cooing cuckoo during visit 4 (August 2). The close proximity of these three sites, detections throughout the breeding season, and probable pair on Tiny Tucker 2 all suggest that there were at least 2 individuals (potentially a breeding pair of cuckoos) at this complex of sites in 2019.

Another area where we had multiple cuckoo detections at adjacent sites in USFWS Proposed Critical Habitat includes the Snake River 1, Snake River 2, and Snake River 13 sites. At Snake River 1 there was an incidental detection between points during visit 3 (July 15). At Snake River 13, we detected a cuckoo during visit 2 (July 1) and it is possible this was a separate individual from the cuckoos detected at Snake River 1 and 2. Snake River 2 had the most detections with three on visit 1 (June 17), two on visit 2 (July 2), and two on visit 4 (August 3). During visit 1, we suspected there were two individuals, and, together with continued detections throughout the season, this suggests there was a breeding pair at this complex of sites in 2019, and possibly a third individual at Snake River 13. We also detected cuckoos in this area in 2018 and our observations led us to conclude that there was a breeding pair that year as well. Notably, we conducted our formal, USFWS-sanctioned Yellow-billed Cuckoo training at Snake River 2 on July 21, and did not detect any cuckoos during this visit, despite recent detections by us and the landowner.

The last location where we believe there was a breeding pair is at Snake River 23 and Snake River 24 within the USFWS Proposed Critical Habitat. At Snake River 23 we had four detections on visit 2 (July 2), including a cuckoo that was first detected by hearing a rapid, squeaky cooing. Shortly after (22 min later) a cuckoo flew into a cottonwood in response to playback and we observed it at length hopping around and preening. It called multiple times, alternating between “kuk” and contact calls and, while it was doing so, a second cuckoo flew in but did not vocalize. At Snake River 24, we detected a cuckoo once, on August 4. It responded to the playback with a distinct contact call with the “kowlp” ending.

We detected single cuckoos at two additional sites: Snake River 4 and Snake River 16. Both sites are within the USFWS Proposed Critical Habitat. At Snake River 4, we detected a cuckoo aurally on visit 2 (July 6). At Snake River 16, we made the detection also on visit 2 (July 9). The cuckoo responded to the playback after the fourth broadcast with a non-uniform “chuck chuck” call. The technician also visually confirmed the detection. We surveyed Snake River 4 and Snake River 16 in 2018, but did not detect cuckoos that year at either site.

We cannot determine with certainty the exact number of cuckoos detected throughout the season. However, we estimate that we detected ~9–10 individuals throughout the season, compared to ~7–8 individuals in 2018, based on the number of times we detected two different birds in one survey morning plus other observations of single birds consistently at other sites. We suspect there is a breeding pair each at the McTucker, Snake River 23, and Snake River 2 complexes, plus single cuckoos at Snake River 4, Snake River 13, and Snake River 16 that might be paired but we could not confirm, and a single cuckoo at Ferry Butte South that we suspect was a dispersing or migrating bird. Importantly, we observed cuckoos at sites with historic observations from surveys conducted by IBO in 2018, IDFG in 2011, 2012, and 2015–2016, and by Reynolds and Hinckley (2005) in 2002–2005. These sites included Snake River 1, Snake River 2, McTucker Island, and Ferry Butte South (referred to as Tilden Bridge in Reynolds and Hinckley 2005), further solidifying this habitat as being an important stronghold for Yellow-billed Cuckoos along the Snake River above the American Falls Reservoir. All detections in 2019 were within the USFWS Proposed Critical Habitat.

In 2019, we estimated potentially detecting one more individual cuckoo than in 2018 and we observed locations of our detections increasing in spatial scope. Our survey effort in 2019 (23 sites, 356 points, 1318 individual surveys, 28 detections) was slightly higher than in 2018 (21

sites, 269 points, 1040 individual surveys, 20 detections) and could be part of the reason why we detected an additional cuckoo. Also, in order to account for sites from 2018 that we chose to not survey again in 2019 (following discussion and consultation, we removed sites if habitat quality was poor), we selected new sites with moderate to highly suitable habitat to replace them, and this could explain the difference in spatial distribution of detections in 2019 compared to 2018. The ongoing presence of cuckoos at these sites could indicate site fidelity, multi-generational use of the same historic sites over time, or quality habitat that attracts unrelated individuals, in all cases potentially for breeding and pre-and post-season movements. As such, we recommend conserving and maintaining the integrity of this habitat and potentially comparing it to other, seemingly suitable, areas of habitat where no cuckoos are detected to determine differences that may be less apparent.

Figure 7. Locations of IBO Yellow-billed Cuckoo survey sites throughout Region 5 showing USFWS Proposed Critical Habitat and sites surveyed in 2019 for the first time, repeated from 2018, or surveyed in 2018 but not in 2019. Sites in the inset map are approximately 15 km northeast of Snake River 24.

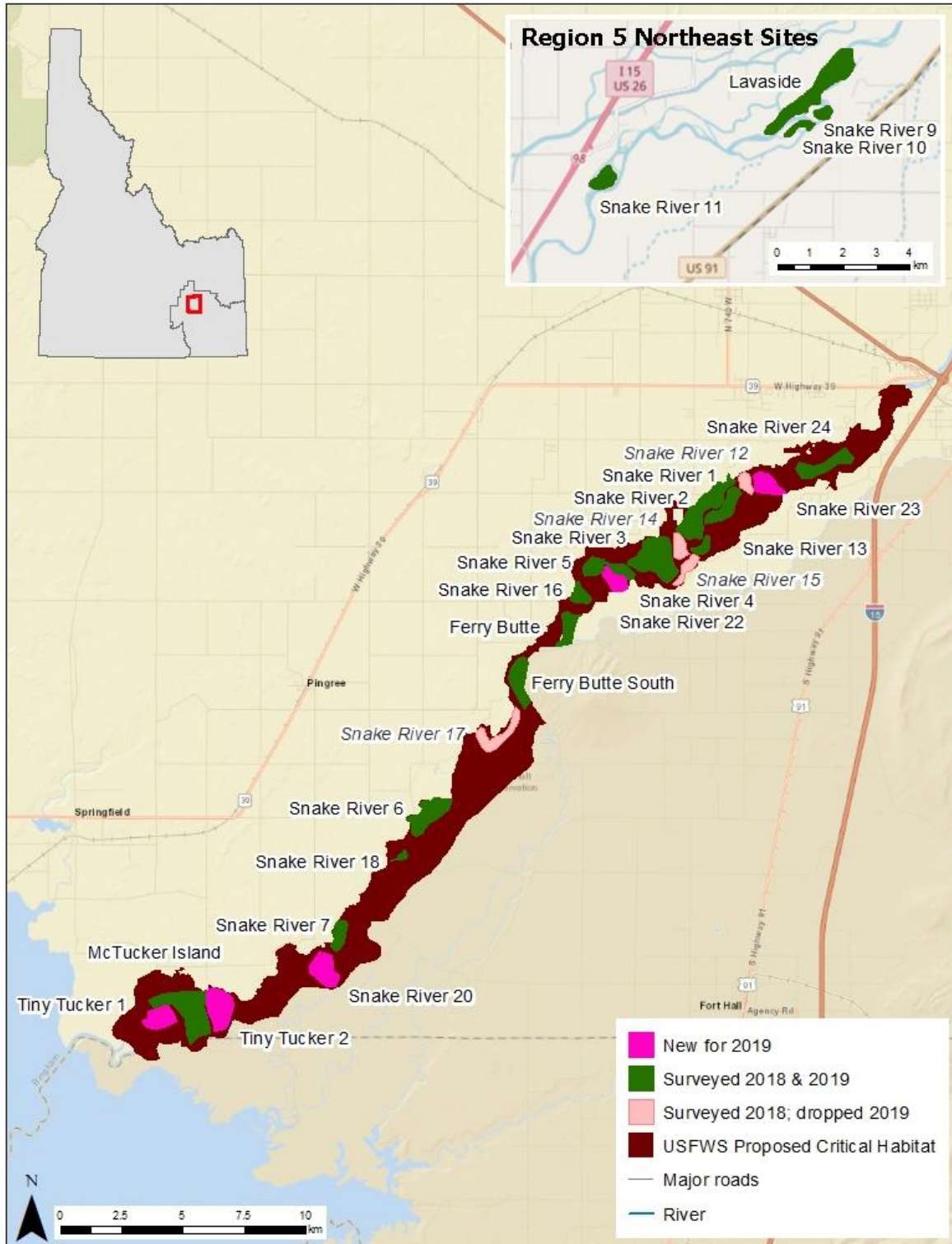


Figure 8. Region 5 IBO Yellow-billed Cuckoo survey sites for 2019 (23 sites) with and without cuckoo detections, showing USFWS Proposed Critical Habitat.

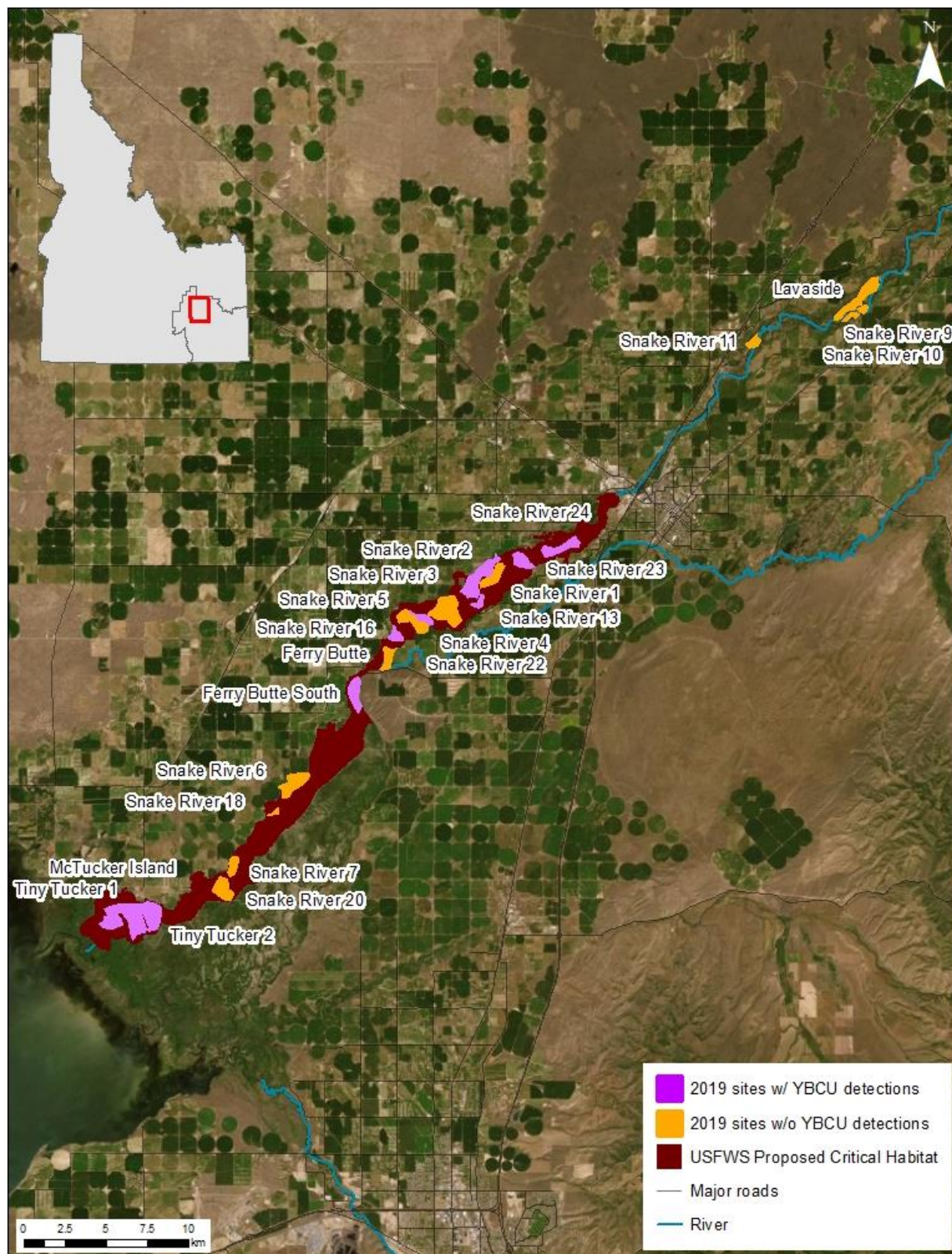
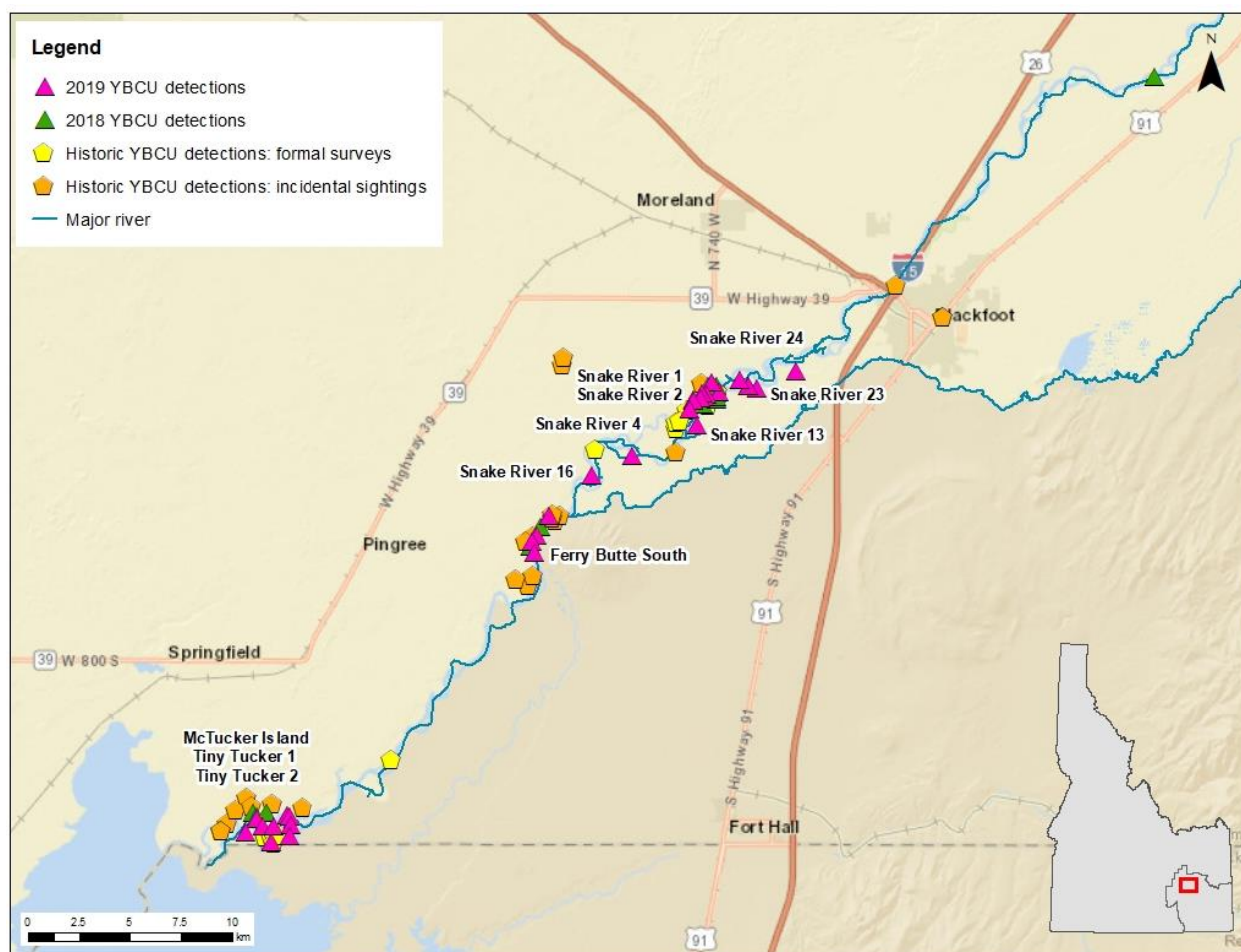


Figure 9. An overview of current and historic Yellow-billed Cuckoo detections from the main survey area of Region 5.



REGION 6

ABSTRACT

We conducted breeding season surveys for Yellow-billed Cuckoos in riparian areas with moderately to highly suitable habitat across IDFG Region 6 from June 15–August 8, 2019. Our objective was to survey the best potential cuckoo habitat within the region, including sites with previous cuckoo surveys and detections, as well as new areas (Figure 10). We conducted four repeat surveys in 34 distinct survey sites along the South Fork and Henry’s Fork of the Snake River. The BLM conducted an additional survey on the main stem of the Snake River, and IDFG completed a canoe survey along the Henry’s Fork. Most 2019 sites were surveyed in 2018 or historically; only five sites were completely new. Region 6 was unique among other regions because 12 surveys required private landowner permission to access and/or complete surveys at sites. Further, we accessed 11 sites via jet boat thanks to IDFG and BLM. We detected Yellow-billed Cuckoos five times throughout the season, all at different sites (Figure 11). Except for a cuckoo detected during the Henry’s Fork canoe route, all were detected during visit 1. In addition to patchy surveys conducted from 2010–2012 by IDFG, and by Reynolds and Hinckley (2005) in 2002–2005, our 2019 efforts represent the second consecutive year of thorough, standardized survey seasons across the breadth of cuckoo habitat in Region 6. Our 2019 survey results, combined with historical records, continue to suggest that Yellow-billed Cuckoos are rare in this area but occur in consistent locations, and some areas of habitat could support breeding birds on an annual basis. Thus, habitat in Region 6 is important for cuckoo life history, including breeding and stopover habitat during migration, and we suggest that continued conservation and restoration could maintain and improve important habitat for cuckoos in this region as part of the greater mosaic of habitat across Idaho.

INTRODUCTION

Region 6 contains the most US Fish and Wildlife Service Proposed Critical Habitat in Idaho at ~57%, as well as other potentially suitable areas of riparian habitat for Yellow-billed Cuckoos. The total area of Proposed Critical Habitat along the Henry’s Fork and Teton Rivers is ~14 km² and along the South Fork of the Snake into the confluence with the main Snake is a

total of ~ 46 km². These sections of Proposed Critical Habitat are the northernmost in the state, 70 km north of southern sections within IDFG Region 5 and 182 km northeast of the isolated section in Region 4. The vegetation community along the South Fork Snake River includes the largest contiguous riparian cottonwood gallery in the western United States (BLM 2018), comprised primarily of narrowleaf cottonwood (*Populus angustifolia*) and understory layers with a mix of Russian olive (*Elaeagnus angustifolia*), mixed willow species (*Salix spp.*), Rocky Mountain juniper (*Juniperus scopulorum*), red osier dogwood (*Cornus sericea*), gooseberry (*Ribes spp.*), and snowberry (*Symphoricarpos spp.*). Almost all of the Proposed Critical Habitat in this region is surrounded by agricultural fields.

Similar to Region 5, Region 6 has a history of Yellow-billed Cuckoo sightings from both formal surveys and incidental observations (1.12). During formal surveys in 2003, Reynolds and Hinckley (2005) detected cuckoos 13 times on the South Fork Snake, three times at Deer Parks Wildlife Mitigation Unit (Deer Parks WMU), and once at Market Lake Wildlife Management Area (Market Lake WMA). They had detections in these same areas in 2004 (12 along South Fork Snake and four detections comprising at least three birds at Deer Parks WMU) and 2005 (20 detections along the South Fork Snake, including three pairs and a single bird that were observed during one survey visit at the Twin Bridges area; Reynolds and Hinckley 2005). IDFG and Bureau of Land Management (BLM) staff conducted surveys from 2010–2012 in this area; in 2010 cuckoos were detected five times at four sites, in 2011 three times at two sites, in 2012 one time at one site (Cavallaro 2011, Abel 2016). In 2013 and 2014, IDFG staff made site visits but did not conduct a full survey effort and scattered formal surveys were resumed in 2015 with a single detection at one site and 2016 when no cuckoos were detected (Abel 2016). Although Reynolds and Hinckley (2005) and IDFG conducted sporadic formal surveys between 2003 and 2016, these surveys did not always include all four surveys as recommended in the USFWS protocol (Halterman et al. 2015) for Yellow-billed Cuckoo surveys (Reynolds and Hinckley 2005, Cavallaro 2011, Abel 2016). Yellow-billed Cuckoo surveys are intensive and require adequate surveyor availability and equipment to complete the rigorous USFWS protocol. Most recently, in 2018, we surveyed 30 sites and detected cuckoos 6 times at two different sites: Twin Bridges and the Henry's Fork canoe route (Figure 12). In 2019, we completed another large-scale monitoring effort within Region 6. In coordination with IDFG, we developed a study design to complete as many surveys as possible at a combination of historic and new sites.

METHODS

We conducted target playback surveys for Yellow-billed Cuckoos, using standardized methods (see General Methods section above), at a total of 34 separate survey sites in riparian habitats along the Snake River and one canoe route along the Henry's Fork (Figure 10). Survey sites were a combination of those previously surveyed by IBO, IDFG, and BLM biologists and new sites (Figure 11). Most sites in Region 6 were on BLM or publicly accessible land, but we coordinated with private landowners by phone prior to each survey visit at 12 total sites. We used jet boats to access 11 sites, which required assistance from, and coordination with, IDFG and BLM biologists and staff certified to pilot jet boats. BLM biologists surveyed one additional site, Lorenzo, via jet boat beginning after the first survey round because highway construction prevented us from accessing the site on foot when we attempted a visit during the first survey period. Due to unforeseen circumstances we could not complete the third and fourth visit to one site that was on private land. We surveyed all sites on foot, except for the canoe route completed by IDFG during which the cuckoo playback was broadcasted continuously at 30 s intervals throughout the entire 5–6 hour survey. Early in the season, extremely high flows made the Snake River dangerous and many sites were flooded and difficult or impossible to access. High flows prior to the start of the season also re-shaped the river path and the boundaries of many of our digitally created survey polygons no longer aligned with what was physically present. Although we did cover at least most survey points in each site during Survey Period 1, we generally expanded and refined surveys during the first visit of Survey Period 2 once access became easier. These were the routes we followed for the rest of the season. Although low flows made jet boat access to some survey sites dangerous and difficult later in the season, this did not impede us from completing surveys during the final visits.



Picture 4. Looking upstream along the South Fork of the Snake River in Region 6. Photo by Stephanie Coates.

RESULTS and DISCUSSION

Similar to 2018, we conducted a thorough and expansive survey effort in 2019 for Yellow-billed Cuckoos. IBO surveyed 34 sites, BLM surveyed 1 site, and IDFG surveyed one canoe route. All but two sites (Lorenzo and Confluence) received a complete season of four repeated surveys. Combined, 31 of the sites were historic (including the canoe route and our 2018 effort) and 5 were completely new (Figure 10). Twelve of the 35 sites were either on private land or required landowner permission to access on foot. We reached 11 sites using jet boats. Six sites were outside the Proposed Critical Habitat (Figures 10 and 11).

We surveyed a total of 377 individual points for a total of 1474 broadcast surveys in Region 6 (accounting for discrepancies when cuckoos were detected and not including one site surveyed by BLM). The BLM surveyed 13 individual points, and one time 8 points, at Lorenzo

for a total of 34 individual broadcast surveys across three visits. Combined, we detected Yellow-billed Cuckoos on four of the total 1508 individual surveys (0.27%), at ~1% of all survey points, and at four different sites (11.43%). We also had one detection during the canoe route. Of all five detections in 2019, all occurred within the USFWS Proposed Critical Habitat (Figure 11).

Historically, cuckoo surveys in Region 6 were limited but did yield detections in some survey years: in 2010, IDFG surveyed four sites and had 15 detections; in 2011, they surveyed two sites and had three detections; and in 2012 a cuckoo was detected at one site surveyed (Cavallaro 2011, Abel 2016). More recently, in 2015, a single cuckoo was detected once (Abel 2016) and in 2018, during IBO and IDFG surveys, six detections occurred at two sites; one of these detections occurred outside Proposed Critical Habitat along the Henry's Fork (Regan and Carlisle 2018).

The first cuckoo detection of the 2019 season in Region 6 was at Deer Parks 4, on June 22 (visit 1) at 0725. The cuckoo responded to the playback with a contact call after the third broadcast call. Deer Parks 4 was also surveyed in 2018 but there were no detections that season. Downstream from Deer Parks 4, at the adjacent sites Deer Parks 7 and Deer Parks 8, we detected a cuckoo during visit 1 at both sites. The Deer Parks 8 detection occurred first, on June 24 at 0531. One day later, we detected a cuckoo at Deer Parks 7 at 0813. The observers' locations at the two detection points were approximately 1 km apart. Both sites are a mix of public and private land and required landowner permission to access. Deer Parks 8 is a new site and had not been surveyed previously. Due to their spatial and temporal proximity, these two detections could have represented the same individual. The Deer Parks 4 detection, approximately 3.6 km away from the detection at Deer Parks 7, may have also been the same individual, but there is no way to tell with certainty. Therefore, we estimate 1–3 individual cuckoos were present at the Deer Parks complex of sites.

We had a fourth detection at Confluence, also during visit 1. The detection occurred at 0902 in response to playback. The Confluence site is on private land, and the detection was barely within the USFWS Proposed Critical Habitat. We did not detect a cuckoo here during visit 2 and, unfortunately, we were unable to complete a third and fourth visit to Confluence due to unforeseen circumstances with regards to site access. Thus, we cannot eliminate the possibility that cuckoos were at the site in the latter part of the season.

The last detection from Region 6 occurred during the Henry's Fork canoe survey route on visit 2 (12 July) at 0738. The cuckoo made one full contact call overlapping with the playback.

The location of the detection was also within the USFWS Proposed Critical Habitat and close to 2018 and historic detections. The ongoing presence of cuckoos at similar locations along the Henry's Fork canoe survey route and other locations in Region 6 could indicate site fidelity, the use of the same historic sites by subsequent generations of cuckoos, or attractive, high-quality habitat (Figure 12).

Our surveys suggest that, in total, there were 3–5 cuckoos in Region 6 in 2019, compared to ~3–4 in 2018. Our survey efforts in 2019 (34 sites; 377 points; 1474 individual surveys; 4 detections) were similar to our efforts in 2018 (30 sites; 348 points; 1238 individual surveys; 6 detections) but although there were fewer total cuckoo detections in 2019, they were more spatially dispersed and therefore possibly represented more individuals. In contrast to surveys in 2018 and historic records, we did not find any evidence of a breeding pair at Twin Bridges 1. Historically, the Twin Bridges and Railroad Bridge area has been a stronghold for cuckoo detections and breeding pairs have been observed here during prior formal surveys (Reynolds and Hinckley 2005). However, the Twin Bridges 1 site is quite large and divided by deeper channels that could not be crossed on foot. There have also been significant shifts in the river channel since 2018 due to heavy spring flows and this changed access to many of our survey sites. Because we were unable to access portions of Twin Bridges 1, it is possible that our surveys could have missed detecting cuckoos at this site. Similarly, we could not complete the full four visits at Confluence. Our lack of detections at this and other sites does not necessarily indicate a lack of presence cuckoos. Further, even if cuckoos were simply stopping over at these sites, such habitat is limited in Idaho. As such, we recommend conserving and maintaining the integrity of this habitat in addition to continued monitoring, especially at sites with detections and suspected breeding in past years.

Figure 10. Locations of Yellow-billed Cuckoo survey sites throughout Region 6 showing USFWS Proposed Critical Habitat and sites surveyed in 2019 for the first time, repeated from 2018, or surveyed in 2018 but not in 2019.

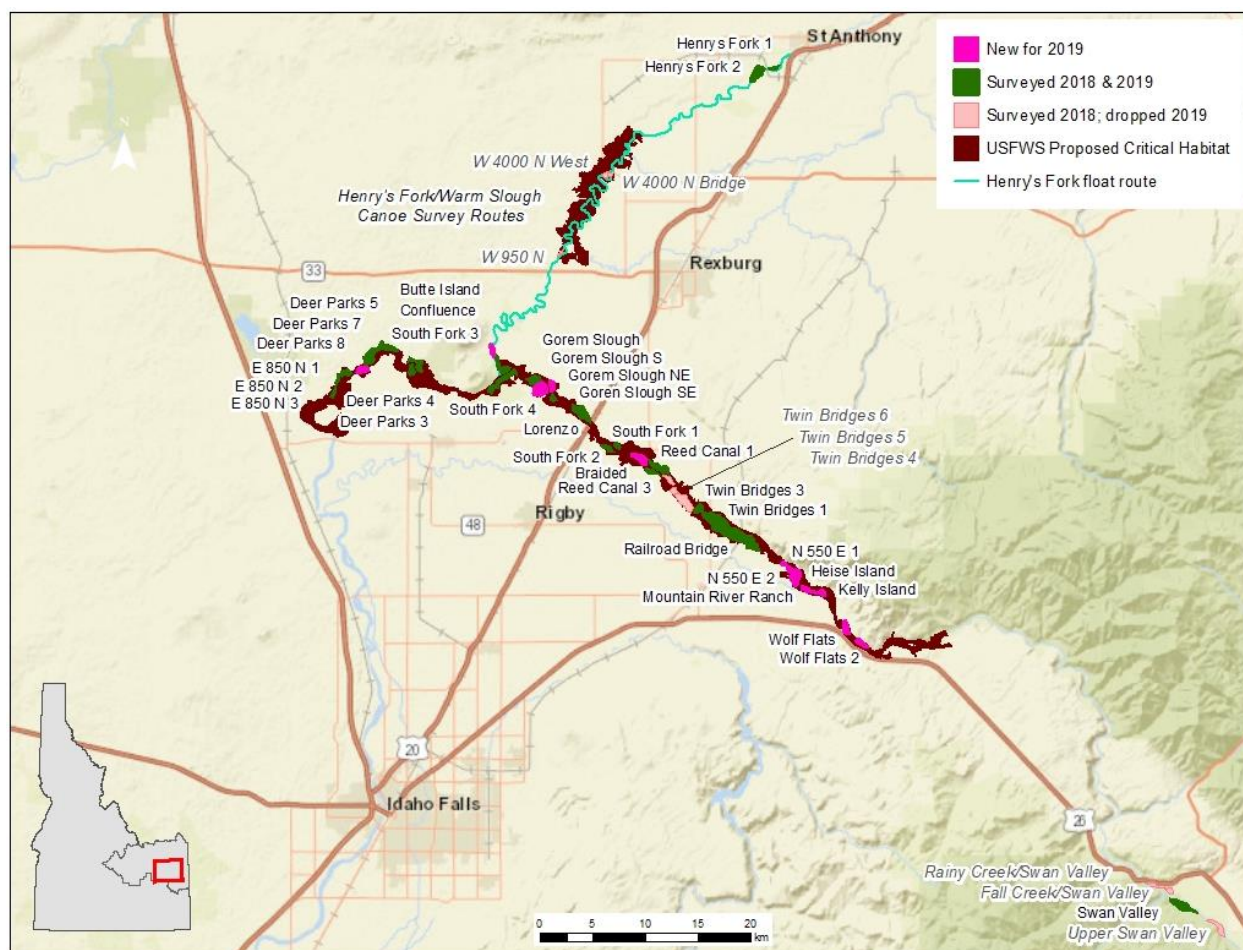


Figure 11. Region 6 Yellow-billed Cuckoo survey sites for 2019 with and without cuckoo detections, showing the Henry's Fork canoe survey route and USFWS Proposed Critical Habitat.

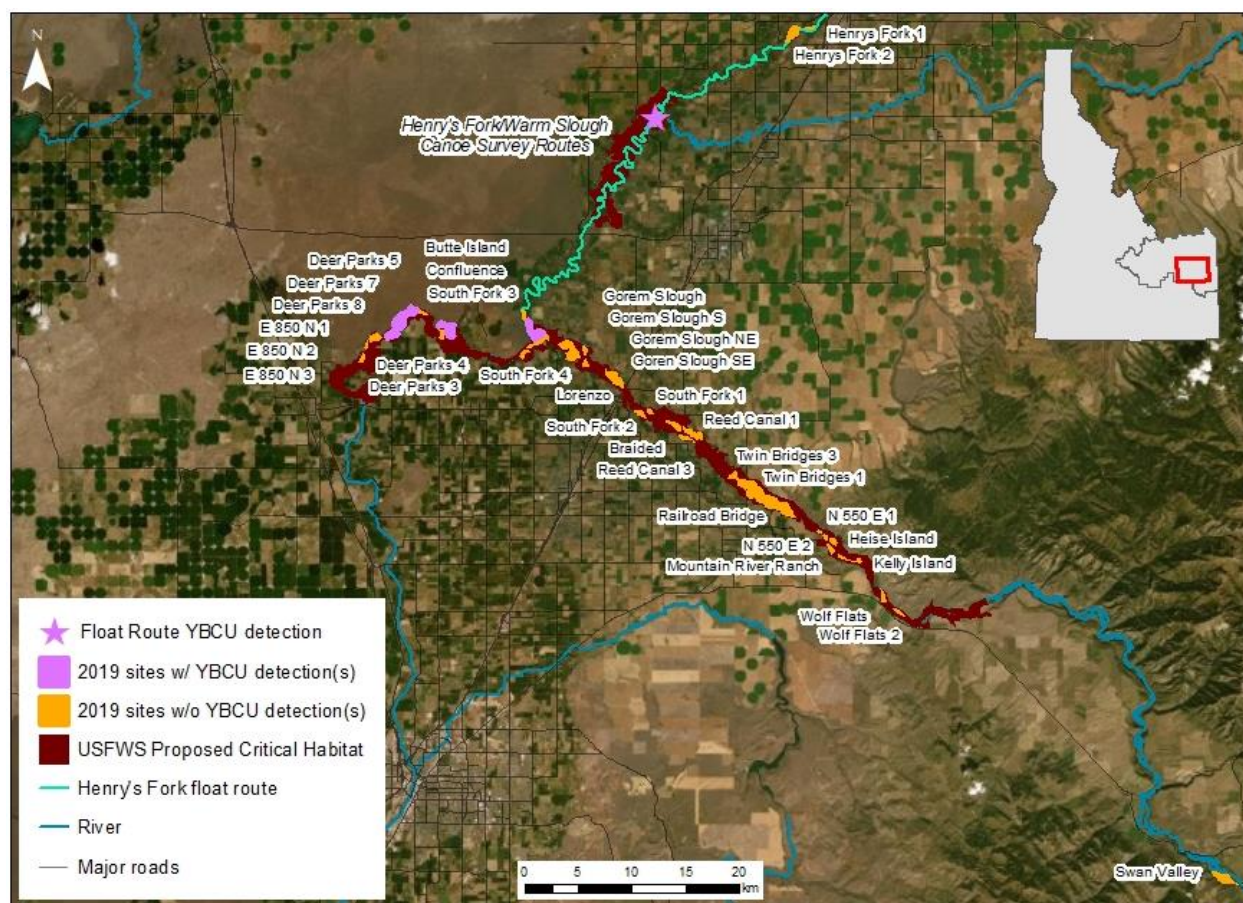
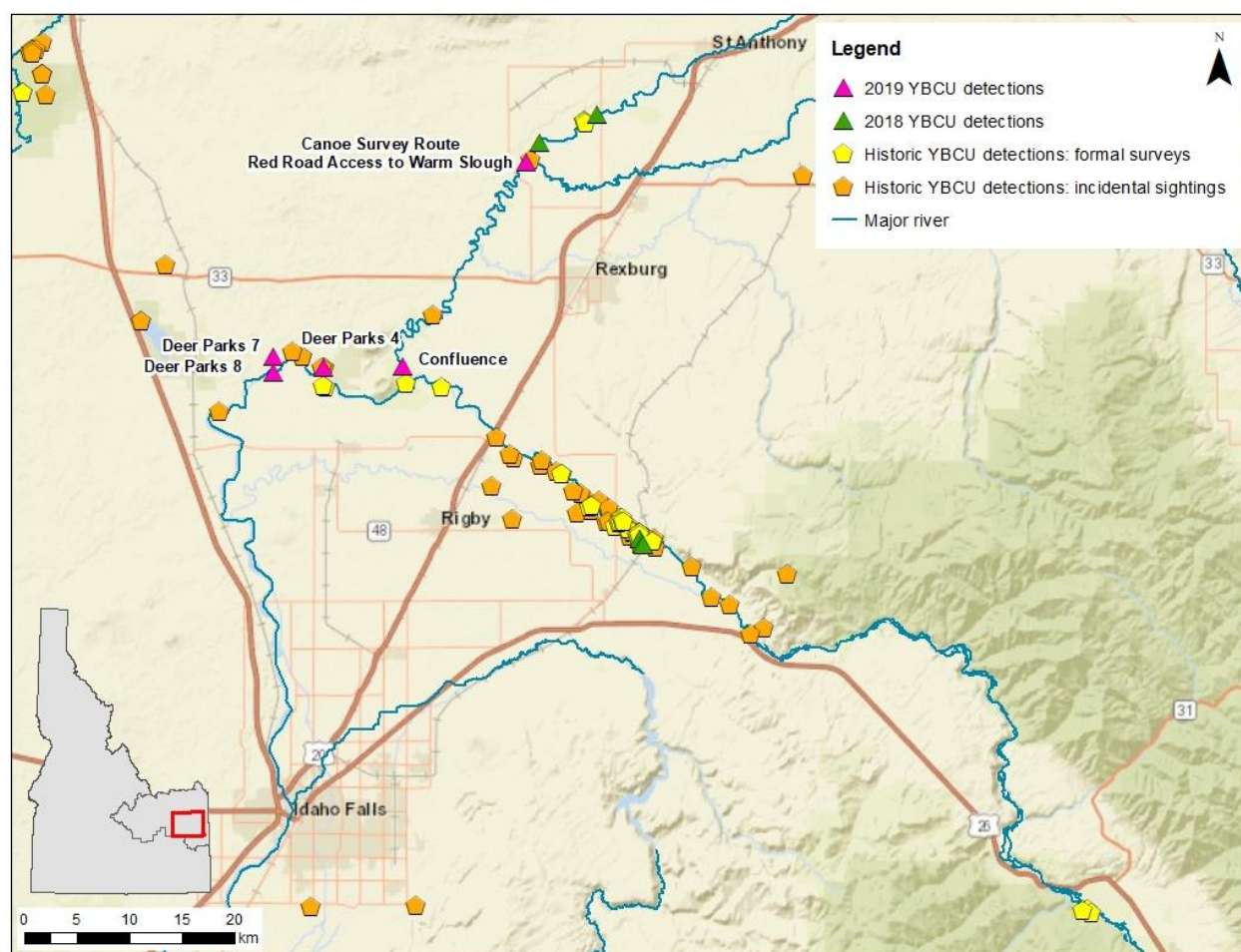


Figure 12. An overview of current and historic Yellow-billed Cuckoo detections from the main survey area of Region 6. Sites with detections from 2019 are labeled.



LITERATURE CITED

- Abel, B. 2016. Idaho Falls BLM District Yellow-billed Cuckoo Survey. Final Performance Report. Idaho Department of Fish and Game, Boise, ID.
- Bureau of Land Management (BLM), 2018. South Fork Snake River. Retrieved on December 3, 2010. <https://www.blm.gov/visit/south-fork-of-snake-river>
- Carlisle, J., and H. Ware. 2010. Breeding season 2010 surveys for Yellow-billed Cuckoos in selected riparian areas within the BLM Shoshone Field Office. Bureau of Land Management, Boise, ID.
- Cavallaro, R. 2011. Breeding Yellow-billed Cuckoo Survey and Inventory-Idaho Falls District, Bureau of Land Management. Interim Report. Idaho Department of Fish and Game, Boise, ID.
- eBird. 2012. eBird: An online database of bird distribution and abundance [web application]. eBird, Ithaca, New York. Available: <http://www.ebird.org>. (Accessed: Date [October 17, 2017]).
- Halterman, M. D., M. J. Johnson, J. A. Holmes, and S. A. Laymon. 2015. A natural history summary and survey protocol for the Western distinct population segment of the Yellow-billed Cuckoo: U.S. Fish and Wildlife Techniques and Methods, 45 p.
- Halterman, M. D. 2009. Sexual dimorphism, detection probability, home range, and parental care in the Yellow-billed Cuckoo. Ph.D. Dissertation, University of Nevada, Reno, NV.

- Halterman, M. D. 2008. Final report for the 2006–2007 Yellow-billed Cuckoo project. Report to the Bureau of Reclamation, Lower Colorado Regional Office, Boulder City, NV.
- Hanni, D. J., C. M. White, N. J. Van Lanen, J. J. Birek, J. M. Berven, and M. F. McLaren. 2018. Integrated Monitoring in Bird Conservation Regions (IMBCR): Field protocol for spatially-balanced sampling of landbird populations. Unpublished report. Bird Conservancy of the Rockies, Brighton, Colorado, USA.
- Hughes, J.M. 1999. Yellow-billed Cuckoo (*Coccyzus americanus*). In The Birds of North America, No. 148 (A. Poole and F. Gill, eds.). The Birds of North America, Inc., Philadelphia, PA. 28 pp.
- Idaho Department of Fish and Game. 2017. Idaho State Wildlife Action Plan, 2015. Boise (ID): Idaho Department of Fish and Game. Grant No.: F14AF01068 Amendment #1. Available from: <http://fishandgame.idaho.gov/>. Sponsored by the US Fish and Wildlife Service, Wildlife and Sport Fish Restoration Program.
- Johnson, M. J., J. R. Hatten, J. A. Holmes, and P. B. Shafroth. 2017. Identifying western Yellow-billed Cuckoo breeding habitat with a dual modelling approach. *Ecological Modelling* 347: 50–62.
- Koenig, W. D., and A. M. Liebhold. 2005. Effects of periodical cicada emergences on abundance and synchrony of avian populations. *Ecology* 86:1873–1882.
- Laymon, S. A. 1980. Feeding and nesting behavior of the Yellow-billed Cuckoo in the Sacramento Valley. California Dept. Fish and Game, Wildlife Management Branch, Sacramento, CA. Admin. Rep. 80-2.
- Laymon, S. A. and M. D. Halterman. 1989. A proposed management plan for Yellow-billed Cuckoos in California. Pages: 272–277 in D. Abell, Tech. Coord., Proceedings of the

- California Riparian Systems Conference: protection, management, and restoration for the 1990's. USDA Forest Service Gen. Tech. Rep. PSW-110, Berkeley, CA.
- Laymon, S. A., Williams, P. L., and M. D. Halterman. 1997. Breeding status of the Yellow-billed Cuckoo in the South Fork Kern River Valley, Kern County, California: Summary Report 1985- 1996. Admin. Report USDA Forest Service, Sequoia National Forest, Cannell Meadow Ranger District, Challenge Cost-share Grant #92-5-13.
- McNeil, S. E., D. Tracy, J. R. Stanek, and J. E. Stanek. 2013. Yellow-billed Cuckoo distribution, abundance and habitat use on the lower Colorado River and tributaries, 2008–2012 summary report. Bureau of Reclamation, Multi-Species Conservation Program, Boulder City, NV.
- Nur, N., S. L. Jones, and G. R. Geupel. 1999. Statistical guide to data analysis of avian monitoring programs. USFWS Biological Technical Publication BTP-R6001-1999. USDI Fish and Wildlife Service: Denver, Colorado.
- Ralph, C. J., G. R. Geupel, P. Pyle, T. E. Martin, and D. F. DeSante. 1993. Handbook of Field Methods for Monitoring Landbirds. General Technical Report PSW-GTR-144. Pacific Southwest Research Station: Albany, California.
- Regan, T. and J. Carlisle. 2018. Yellow-billed Cuckoo Habitat Use in Southern Idaho: Annual Report. Intermountain Bird Observatory, Boise State University, Boise, ID. 56 pp.
- Regan, T. and J. Carlisle. 2017. 2017 Yellow-billed Cuckoo surveys in riparian areas within the BLM Shoshone Field Office, Final Report. Bureau of Land Management. Boise, ID. 49 pp.
- Reynolds, T. D., and C. I. Hinckley. 2005. A survey for Yellow-billed Cuckoo in recorded historic and other likely locations in Idaho. Unpublished report, TREC. Inc., Rigby, ID.

United States Army Corps of Engineers (USACE). 2015. Yellow-billed Cuckoo Boise River Survey Summer 2015. Walla Walla District Technical Publication PM-EC-2008-0001. US Army Corps of Engineers, Walla Walla, WA. 9 pp.

United States Fish and Wildlife Service (USFWS). 2018. Endangered and Threatened Wildlife and Plants; 90-day Findings for Three Species. Department of the Interior, Fish and Wildlife Service, Federal Register, 50 CFR Part 17. Vol 83 (24): 30091–30094.