

Streaked Horned Lark Regional Working Group Meeting
16 September 2010



MINUTES

In Attendance

American Bird Conservancy: Bob Altman; City of Portland: Claire Puchy; McChord Air Force Base: Valerie Elliott; OR Dept of Fish and Wildlife: Susan Barnes, Laci Bristow, Andrea Hansen, Ann Kreager; Oregon State University: Randy Moore; Port of Portland: Carri Butler; Portland Audubon: Mary Coolidge; Portland Metro: Elaine Stewart, The Nature Conservancy: Hannah Anderson; US Army Corps of Engineers: Paul Schmidt; US Fish and Wildlife Service: Jock Beall, Cat Brown, Kim Flotlin, Bill Ritchie; WA Dept of Fish and Wildlife: Scott Pearson, Derek Stinson, Michelle Tirhi; WA State Parks: Lisa Lantz.

Announcements

- Publications:
 - Camfield et al. 2010 – J. of Avian Biology. Compares high elevation alpine lark to low elevation streaked horned lark. The article demonstrates that STLH is doing poorly and provides some insights into decline. The analysis is based on WA and Col River sites only, and does not include WV population. If WV is a source, it could be providing new individuals to other areas in range. Interesting possibilities for sharing genetics between populations.
 - Moore reports – Willamette Valley STHL work by Dr. Randy Moore reported up through 2010 season. Reproductive success and monitoring through 2009 are done and available upon request. There will be a publications submitted regarding winter distribution in WV. Another paper is being prepared on distinctiveness of plumage characteristics in relation to surrounding subspecies.
 - Altman CPOP paper – As a follow up to the ecoregion wide conference of the Cascadia Prairie-Oak Partnership (CPOP), a special edition of the peer-reviewed journal *Northwest Science* will be published in 2011 focusing on prairie and oak habitats and species in the Willamette Valley – Puget Trough – Georgia Basin ecoregion (WPG). For this volume, Bob Altman has prepared and submitted a review paper for all bird species in prairie-oak habitats looking at historic and current distribution in the WPG, including population estimates.
- Lark/Airport Workshop Date and Location – *H. Anderson*
 - Working on defining date and location for the workshop.
 - Note that Eugene, McMinnville, and Salem Airports have STHL.
 - **Update Jan 24, 2011** – The workshop will be held March 9th, 2011 at the Water Resources Education Center in Vancouver, WA. **See Page 10 for invitation.**
- Wildlife Action Plan Grant Opportunity, deadline January 2011 – *D. Hays*
 - WDFW is interested in pursuing a multi-state wildlife action plan grant proposal (SWG) for prairie-oak species in Oregon and Washington.

- The project could include on the ground restoration projects, perhaps emphasizing cooperative projects at OR & WA, and within that could build in desired other components such as monitoring, research, education, collaboration
- **Update Jan 24, 2011** – A collaborative of partners submitted a proposal titled Birds and Butterflies in Prairie-Oak Habitats of the Pacific Northwest: Enhancing Bi-State Partnership for Conserving State Strategy Species. Award notification in June 2011.
- **Update Jan 24, 2011**- TNC WA has created a document that integrates the prairie-oak components from both the Washington and Oregon wildlife action plans.
- Mt Pisgah – A large parcel adjacent to Mt. Pisgah has transferred into conservation status. There may not larks there now, but perhaps there is potential for restoration or management. Lane County may be better for larks than we give it credit. Some agricultural areas that are managed for grass seed were well occupied by larks this year. The landscape structure is not the valley floor, and there are many tree rows in between agricultural plots, and it is pressed up against the foothills of the coast range. But, they are still there, probably 100 acres.
- **Update Jan 24, 2011** – ODFW report titled Declining and State Sensitive Bird Species Breeding in Willamette Valley Grasslands: 2008/09 Status Update is available. This is the roadside point count work that Bob Altman conducted in the 90s, repeated by ODFW in 2008/9.
http://www.dfw.state.or.us/conservationstrategy/docs/GrasslandBird_SummaryReport_Final2010_wit h%20page%20numbers.pdf

Surveys and Monitoring

- 2010 Washington Survey Protocol - *H. Anderson, S. Pearson, M. Tirhi*
 - This year partners implemented a survey protocol and standardized data collection at most known occupied sites in Washington. Repeated visits with surveys on transects were conducted. Distance sampling is being considered for future surveys. Damon Point, Ledbetter, Midway Beach were not surveyed in 2010 and should be included in 2011. Should discuss how and when, what to connect with WV on at least some sites. How does territory mapping vs. transect surveys perform? Basically the same, although territory mapping gives a better picture. Trying to do 4 surveys per site, need to look at data to see if the surveys can actually detect a trend through time. Needs to be embedded into a sampling scheme. The protocol is only what you do when you hit the ground. Need a scheme that can tell us about what sites are occupied, and what change is occurring on sites and between sites. Seen lots of movement between sites. Col River islands more similar but not as extreme as populations in WV, where they can move between fields within a season.
 - Points to the need to develop a scheme that could be applied range-wide. Seems like a high priority since we are doing these surveys. Could integrate other prairie species into the scheme, vesper sparrows, w. meadowlarks.
 - In previous meetings we set a population goal of double the number of larks in 5 years. The purpose of the population goal is to stimulate further action in the way we want to go.

- Ledbetter HRA – *B. Ritchie*
 - Haven't implemented the same sampling in 2010, but will be working on that in 2011. For transect work, should include the mudpans adjacent to the HRA. WDFW surveyed in the state park to the south of the refuge, did not detect any larks in the five 1-acre locations surveyed.
 - Have done territory monitoring in the HRA and were implementing the exclosure study in 2010. They detected 8-10 territories with 8 assumed nests - found 5 actual nests, 3 YOY observed. They think 2 successful nests, one abandoned (exclosed), 3 predated (unexclosed), 2-3 unknown outcome. 2 of the birds banded as chicks in 2009 were breeding in the HRA this year. Larks numbers likely increasing since 2008.
 - Started developing a predator management strategy this year. Will have a program to document and record observations and data on predator use.
 - Maintained the existing HRA, not increased, but did remove another 65 acres of *Ammophila*. Herbicide and then bulldozed.
- 2010 OR Breeding Monitoring – *R. Moore*
 - Reduced effort field season this year. Did Reproductive success monitoring at Finley, moderately good success (haven't yet crunched numbers). This year there was some active management for larks in the course of trying to established grass for goose forage in the 2 fields where larks occur. 35-40 pairs (increased over last couple years) likely due to how there were managed.
 - Monitored the historically 2 largest popns – Corvallis airport and MDAC farms (WRP restoration). Corvallis airport 85 pairs staying steady. Banded about 150 chicks in 2009, at least 9 returned to breed in 2010. So getting some good data that will allow us to do some demographic analysis on adult and juvenile survivorship. Also still have some 2008 birds. Most birds breed along the runways and the ag land that is around the airport. This ag land is generally not very suitable for lark territories, but this year a great deal of that land was taken out of ag production in the preliminary steps of turning it into a different crop and so a great deal of lark habitat opened up. Birds did not respond to it directly, but appeared to expand their marginal territories along the gravel aprons.
 - MDAC surveys in 2008 and 2009 has had 75+ breeding pairs. We have expected prairie restoration to go through succession to a point where it was no longer attractive to larks. What we expected to happen in 2009 but didn't, did happen in 2010. This year, there is a gravel road that runs through the restoration project, the only lark territory in 2010 occurred here. Entire 600 acres is now no longer suitable for larks. There was one single lark male holding territory on a log floating in a lake very early in the season. In the past, vernal wetland flats appear in July where the water had receded enough to uncover previous territories. Total lark count in 2010 at MDAC was at most 6 territories. MDAC was scheduled to be burned last year, and may get burned this year. Will be important to monitor for larks. Higher priority to get this done, but rain is a problem. Tough year for burning... Some discussion of introducing a manual disturbance regime in the drawdown to set back succession on vernal wetland flats.
 - What is the management plan for MDAC? Larks don't drive the plan, but can benefit. NRCS who oversees the WRP has contracted with Jock Beall (FWS WV Refuge) and Partners to do the management at MDAC up to a certain point, which

will be ending sometime soon. Driven by NRCS concerned about establishing native habitat on former agricultural land. So mgmt for larks not built in, would fall on someone else to keep larks in the plan as long as they don't alter native plants. There are competing interests. Wouldn't put too much faith in burning. Burned habitat would provide winter and late spring habitat but once it takes off in the growing season, vegetation becomes thick very fast. One interesting thing we are learning from MDAC is that they will use thicker habitat than we thought before. So will matter how far apart the planted bunches are. So larks could perhaps get one nest in before it gets thick.

- NRCS and associated partnerships in that watershed. Action ** Get more info. – Ann Kreager? Elaine Stewart?
- So where did the MDAC birds go? Diamond hill road there is a gravel shoulder that borders MDAC, perhaps they are there? This year they were there, but also using little drowned out spots in the perennial ryegrass field. Territories were close together, shared a boundary. Who knows? In the surrounding ag land.
- Multnomah County – rep success monitoring at both Rivergate and PDX.
 - 5 pairs at Rivergate same as last year, very early breeding, first fledged 11th of May, can breed early because of well-drained dredge material. 100% success. Did have a predation event, a chick picked off by a Kestrel. Gave specimen to Smithsonian. Although there is 100% success, the population is not increasing there, and the whole site is not occupied. Brings us back to the question of juvenile survival.
 - PDX had 3 territories, up 1 from last year. Both nests detected successful.

Research

- 2009-10 Restoration Trials along Columbia River Islands – *H. Anderson*
 - Herbicide application will be an important tool, but on the islands in water.
 - ACOE did create some topography on Miller Sands to discourage terns. Not likely great for larks.
 - Final report of restoration trials forthcoming spring 2011.
- 2009-10 Nest Exclosures in OR & WA – *S. Pearson, B. Ritchie, R. Moore*
 - Results are forthcoming – report due out March/April 2011. First blush is maybe not a useful strategy, but data not yet analyzed. Is it minimal cost? Could have net negative effects, particularly if adults get predated. Don't use them early season when falcons are moving through. Predators key in and can perch. There is a meta-analysis of exclosures just published recently in Biological Conservation. In most recent snowy plover report outlined issues. Yes, we could use them with larks, but should be used very cautiously.
 - Questions what happened to the chicks after they leave the nest. Do the predation rates increase on juveniles once they leave the nest? Period between fledging and flying is a great unknown for passerines.
 - Harrier predation video clip from Randy's work available on YouTube.
- 2010 St. John's Landfill Vocal Attraction– *P. Vandenburg, E. Stewart, T. Mitchell*

- Late last summer Metro was interested in trying to attract larks to the landfill. Seems to have an appropriate landscape setting. The attempt was made with boom boxes, tapes with song, 2-d decoys. They were deployed in the fall, and no response from late season prospecting was detected. Started it up last week of February. The day after it was set up, there were 2-3 larks on the plot for almost a week and then never again through the season. Not sure if they were streaked. So no breeding there, but encouraged to try more vocal attraction and manage a site to make it more attractive. Encouraging first step. Goal was to see if we could bring birds from Rivergate, since it may not be viable in the long-term, which the landfill would be.
- When should we be moving birds, and under what conditions. What would happen if we let the Rivergate site go away? Would they move to the Columbia river? Or PDX? We need to think through all these steps.
- **Update January 24, 2011** – H. Anderson will be producing a paper, to answer some of the questions regarding when it is appropriate and with what mechanisms to attempt to move birds.

Restoration & Management

- St. John's restoration – *P. Vandenburg, E. Stewart, T. Mitchell*
 - Lots of variables that they need input on for that site. Heavy predator load - kestrels, harriers. Have spiked the well heads. Maintenance road runs right through the middle of the patch. How much disturbance and researcher attention is ok? Human presence definitely does bother larks in general, but not enough to exclude birds.
 - Still dealing with a really heavy weed load. Holds water, managing the soil.
 - Metro is updating the Smith and Bybee wetlands management plan (includes the landfill) and the lark is called out as a specific target for conservation.
- Multnomah County potentials – *C. Brown*
 - Northern WV lark conservation – are there larks now, where should there be larks? Rivergate, PDX SW quad, PDX north of runway and Lovejoy all have larks now or did historical. And 5 sites that are potentials – ODFW Sauvie island, Ridgefield Refuge, Gov't Island, Tualatin Refuge, Lovejoy Metro property.
 - Government Island. Port of Portland may be targeting restoration for grassland habitat. The place that will probably be most suitable for larks (dredge spoils) are not being targeted for grassland mgmt. Airport may be interested as using Gov't island dredge spoil as mitigation for SW quad. But that area does get a fair amt of human use, but humans may only be on the beach and larks may be inland. It may be manageable to have double use for humans and larks there. Dave Helzer is the person who has been following this. There is an agreement between the city and the port to do mitigation in advance (trial 50 acres) to determine the best way to do grassland enhancement. Have done baseline monitoring, looking at pollinator habitat. Potentially up to 300 acres of mitigation habitat. If the port wanted to develop 25 acres then they need to 50 acres of mitigation.

- FWS will work with Tualitin and Ridgefield Refuges to do some surveys in 2011. FWS would like to work with ODFW to do some Sauvie island surveys (there are Audubon citizen science oak folks doing bird surveys too).
- **Action:** get together to discuss 2011 surveys. Connect with Elaine Stewart, Susan Barnes, Mary Coolidge. Randy would commit time to review larks with volunteers and take them to an occupied site. April is the time to do that, birds are singing, but before actual breeding. **Action:** Share the WA transect protocol.
Update January 24, 2011 – See Pages 11-14 for draft protocol and data form. The protocol and data form will be updated prior to survey implementation in spring 2011.

○ Finley Refuge – R. Moore

- For the most part, have decided to manage larks in an Ag setting, not a native prairie setting, which is not suitable for larks in the WV except in the first year. Ag fields that are good for larks are basically crop failures or are fallow. Even creating a mosaic of habitat with prescribed fire may not be sufficient because in the WV the soil is so much richer that the vegetation grows in so much quicker than on glacial outwash. Plant community gets so robust in a short amount of time and growing season so much earlier.
- Restoration project going on at Finley not aimed at larks but did host larks for the 1st 2 seasons and then did not.
- Most exciting thing and important step – have started the discussion with refuge biologists of the possibility of managing refuge fields specifically for larks and geese at the same time. There was a meeting on 1st of Sept about refuges managing for larks and how to make that happen. Goal to create sustainable sites for larks in the Valley.
- Geese are the mandate for the refuge. It has become clear as we have been working at the mid-valley refuges that there may be some significant difficulties in managing effectively for larks related to the historic management strategy for goose forage. Goal would be to provide a dual prescriptions that would feed geese in the winter (Oct – mid april) and make lark breeding habitat in the summer (mid april – mid august).
- Traditional management at the refuge is to have the lands farmed cooperatively by local farmers who are responsible for creating goose forage when the geese are on the refuge and then can get a cash crop out of the refuge when the geese leave. They have been working with tweaking that system at the 2 fields at Finley that have larks. Have been working with the same farmer, but the cooperative farmer system may be problematic, since by providing good lark habitat in the summer it is difficult for the farmer get the good cash crop out of the field. So inherent tension in the system. Subsidizing the farmer could be a potential solution.
- Need a core population to function as sources in any recovery strategy. How do we promote the resources necessary for the refuges to take on species specific management that have been taken out of cooperative farming.
- Mid valley refuges finalizing their CCP, need to set the population goal that would equate to habitat acres that would be managed for suitable habitat for larks. **Action: Come up with a target numbers of birds and acres. Stated as “easy” in the group discussion.**
- ODFW Sauvie Island ag land is managed for geese and could also be managed for larks like what is suggested for Refuge lands.

- South Sound Prescribed Fire – *H. Anderson*
 - Ramping up availability of fire in south sound. Seem to work excessively well on drained soils and effects seem to last for a few years after the fires. May be best to burn in August in September to get really hot fires, but really depends on the ecological objective being sought with each fire. Anecdotal observation at McChord that it has burned on the airfield and scorched it and then the grass has come back thicker than ever.

Policy

- NRCS Lark Technical Note, recommendations for agricultural land management
 - Dictate when and how they do their rotation when they change from one crop to another. Incentive payments to farmers in a strategic geographic format across the valley.
 - Will finalize something soon, but it will be a work in process.
 - **Update January 24, 2011** – Tech note scheduled for completion April 30, 2011, supported by DOD Legacy through WA TNC.

Working Group Structure

- The group discussed having one annual meeting for the full working group where we would come together as we have previously to update each other on progress on various projects as well as work to refine and update the action plan. The annual meeting will occur each September, convened by TNC Washington, hosted in Portland by USFWS.
- Throughout the rest of the year, there will be subgroups aimed at specific actions/targets. Two topics that have risen to the top are: monitoring and private lands. **Action:** Randy will lead the monitoring sub group.
 - Private Lands. **Action:** Cat will lead the private lands group.
 - WV and partners have a preliminary project plan to get approved for land protection to cover the entire valley. Regional director has directed agricultural easements for “wildlife purposes”. Thrust of this has been for Canada geese due to predation issues. Perfect opportunity to slide in something like streaked horned larks. Easement would include creating forage for geese and also some direction to benefit streaked horned larks. Create a dollar amount to subsidize the reduced yield. Still very early in the game. Land protection plan. Need a focus group to talk about private land issues. What are the tools, and what are the mechanisms we can use. FWS incentive program that is not unlike NRCS incentives, but would be focused on wildlife species. Cat and Steve Smith with work on the private lands group.

Action Planning

The group spent the remainder of the meeting updating the STHL wildlife action plan. The wildlife action plan is a fluid plan that documents the next best thing to do for the species. It is not a full-fledged recovery plan that outlines all steps, but rather an up-to-date plan that takes into account what has been accomplished. Relative rankings are given to a number of the tasks on the plan. Tasks are ranked in priority by number (#1 is highest priority), followed by those

asterisk, followed by those without any ranking. However, if a task shows up at all on the plan, it is considered a priority action.

The following are the ranked tasks in the plan. The full plan is available as a separate document.

1. Secure protection commitment on core occupied sites, e.g. management plans, CCA(A), mowing regime change, prescribed fire (range-wide)
2. Implement habitat restoration activities on breeding and wintering grounds (Col River and Coast).
3. Determine other factors limiting juvenile and adult survivorship
4. Determine the effect of habitat parameters on nest success in the WV – 2008-10 complete, continue and include private working lands, synthesize with WA data.
5. Evaluation appropriateness of egg-swapping between OR & WA
6. Develop management prescriptions to create breeding habitat and winter habitat in agricultural matrix, e.g. Finley.
7. Direct dredge material deposition to systematically create lark habitat
8. Implement strategy to control invasive beach grass and equisetum on islands
9. Finalize a standardized range-wide monitoring protocol that includes comparable survey protocol for occupied sites that addresses abundance, spatial distribution, reproductive success, wintering populations and unoccupied sites.
10. Implement habitat restoration activities on breeding and wintering grounds e.g. Corvallis airport, basket slough, Finley, PDX (WV).
11. Continue control measures to address invasive weeds on breeding grounds with limited negative impact to larks. Focus on invasives that change the structure of the habitat – ongoing (South Sound).
12. Implement prescribed fire program (South Sound).
13. Evaluate appropriateness and feasibility of population augmentation, relocation or reintroduction
14. Implement habitat restoration activities on unoccupied sites within the breeding and wintering range e.g. St. John's landfill, Sauvie, Gov't Islands.
15. Conduct larks and airports workshop series
 - * Determine attributes of high quality winter habitat including diet – need complete data set
 - * Evaluate the use of nest exclosures range-wide – analysis underway
 - * Develop winter habitat management prescription

Update January 24, 2011 – Task #5 has been undertaken by Scott Pearson and Derek Stinson, WDFW. They submit to the group the white paper Evaluation of the Need for Genetic Enhancement of Puget Lowland Streaked Horned Lark Populations (page 15-17).

The authors propose that the action is warranted and suggest it be experimentally implemented in the short term to avoid population loss at 13th Division prairie in south Puget Sound.

They suggest that language for priority #5 task (1.5.5. in the action plan) “*evaluate genetic enhancement of Puget lowland populations*” be replaced with, “*develop a proposal to conduct genetic enhancement of the Puget lowland population and conduct an experimental enhancement in the spring/summer of 2011*”.

Update January 24, 2011 – Comments from those using the Lark Action Plan have suggested that some refinement/definition of some of the language used in the plan would be helpful to make it clearer. Terms suggested for clarification include “restoration”, “management” and “protection.”

Streaked Horned Larks at Pacific Northwest Airports

Learning – Understanding – Finding Solutions



Please join us for a one-day workshop to address the presence of the **streaked horned lark** at **Pacific Northwest airports**. The streaked horned lark is an extremely rare bird found only in isolated sites in Washington and Oregon, including many airports. It is a candidate for listing under the federal Endangered Species Act. Should it be listed as threatened or endangered, considerable restrictions could be placed on airports by the US Fish and Wildlife Service.

This workshop will address two potentially conflicting issues:

- Pacific Northwest airports contain some of the last remaining habitat for the rare and declining streaked horned lark.
- Birds are a known hazard to aircraft.



This will be a collaborative workshop between airport managers, aviation agency staff, wildlife agency staff, researchers and conservationists to seek solutions to this potential conflict.

Conservation of the streaked horned lark and the maintenance of airport safety do not need to be mutually exclusive. With participation by many partners and creative strategies for conservation planning, together we can reduce the likelihood of Endangered Species Act listing and find proactive, practical solutions to this difficult issue.

When: **Wednesday, March 9th, 2011. 9am – 4pm.** Registration opens at 8:30.

Where: **Water Resources Education Center**

4600 S.E. Columbia Way
Vancouver, Washington 98686

Recommended directions (internet site directions may be inaccurate):

<http://www.cityofvancouver.us/watercenter.asp?waterID=25038&waterSubID=27437>

What: Morning sessions will present nationwide research and experience regarding wildlife hazard prevention and species conservation at airports. The afternoon will focus on the streaked horned lark itself, and its occurrence and conservation efforts to date at Pacific Northwest airports. **Lunch will be provided for attendees at the Water Resources Education Center.**

Register: **Please fill out and return the attached registration document (scroll down) to Hannah Anderson at handerson@tnc.org by February 9th, 2011 so that we may appropriately prepare for attendance.**

For more information contact: Hannah Anderson – handerson@tnc.org – 360.701.8803

Support for this workshop is provided by the Department of Defense Legacy Program and the US Fish and Wildlife Service.



Washington
Department of
**FISH and
WILDLIFE**

PROPOSED METHODS FOR WILDLIFE DATA COLLECTION "FORM B"
(Consult instructions before completing this form)

This form should be attached to "Form A" when completed

Submitted by: Tammy Schmidt
Date: 3/25/2010

Mailing Address: **7801 PHILLIPS RD SE, LAKEWOOD, WA 98498**

Brief description of proposed activity (copy from Form A):

Conduct surveys to detect presence and acquire indices of abundance of the Streaked Horned Lark (*Eremophila alpestris*) by visual and/or auditory detection during the breeding season on known occupied habitat.

1. Species: **Streaked Horned Lark (*Eremophila alpestris*)**

2. Objectives:

- Confirm the presence of Streaked horned larks by conducting line transect surveys throughout occupied habitat at Joint Base McChord-Ft Lewis -- airfields, artillery impact area, 13th Division Prairie, Ranges 74/76/51; Olympia Airport; Shelton Airport, outer WA coast; Columbia R islands.
- Acquire estimates of abundance
- Provide a non-invasive method of inventory
- Provide an efficient and repeatable survey design
- Provide consistency among surveyors
- Provide standardized protocol for survey and management

3. Describe in detail the methods that will be used to complete the above activity
(Or attach description to this form):

Surveys to detect presence: Streaked horned larks are migrant, ground-dwelling passerines that have adapted to nesting on open grasslands, sparsely vegetated beaches and dredge spoil islands (Stinson 2005). They prefer bare ground and vegetation no more than several inches tall (Beason 1995, Altman 1999, Rogers 2000, Pearson and Hopey 2005). Streaked horned larks are loosely colonial nesters, with both males and females detectable during the breeding season, which occurs roughly from March through August. Survey timing is designed to coincide with clutch initiation curves – first clutches are initiated at the end of April at all sites and taper off dramatically in the Puget Sound area in early July; later on the coast and Columbia River (Pearson et al. 2005). Males are socially monogamous for the breeding season. Males are easier to detect because they sing on the ground and also perform aerial courtship displays.

Methods: Surveys should begin within ½ hour of sunrise and end by 12:00 noon on days when wind is less than 20 mph with little to no precipitation (light drizzle and brief showers are fine). Surveys should end by 11:00 a.m. or earlier on days when the predicted maximum temperature is 80 F or

higher. Four surveys per location should be conducted between 19 April and the first week of July in the Puget lowlands and between 19 April and mid-July for the outer coast and Columbia River as follows:

Survey 1: last two weeks of April **Survey 2:** mid two weeks of May **Survey 3:** mid two weeks of June **Survey 4:** first week of July (Puget lowlands) through second week of July (outer coast and Columbia River). At sites where access is limited, priority should be given to May – July surveys.

Line transects – observers should be positioned 75 m from the survey boundary and 150 m apart (to avoid double-counting and to maximize detection ability) on predetermined transects/routes and should maintain a slow-moderate pace. Observers should stop every 150 m for approximately 1 minute to listen and scan for larks. Pausing to confirm a detection is allowed, however all observers should remain parallel. Transects should cover as much suitable habitat as possible in the allowed time window. Surveyors should familiarize themselves with vocalizations of male streaked horned larks, flight display behavior, and differentiating larks by sex and age. Young of the year birds look markedly different from adult birds. Every effort should be made to cover all areas with suitable habitat, preferably each time an area is surveyed. However, varying the area surveyed during each of the four surveys is acceptable for large expanses to ensure complete coverage. Observers should rotate between sites/transects and walk the survey route in the opposite direction on subsequent surveys.

Observers will independently record the approximate detection location of each bird on an area orthographic map, as well as the corresponding bird number from the field form. Environmental conditions, age, sex and behavior (see below). Observers may communicate with each other by radio or mobile if necessary. Waypoints should be verified at the beginning, end, and intermediate locations for each transect to verify observers remain on transect. Observers may briefly leave a line to avoid flushing birds or disturbing nests.

Data Recording: (field form attached)

- To avoid confusion between American (month/day/year) vs European (day/month/year) methods of writing dates with Arabic numbers, date should be written with a two-digit numeric for day first, the month using a three-letter abbreviation (e.g., Feb, Mar) second, and the year as a four-digit number last (ex. 26FEB2008).
- The lead observer should record surveyors' full names (not just initials), cloud cover, wind, precipitation, and air temperature at the beginning and end of the survey.
- Record the survey start/stop times. Time should be recorded on a 24-hour clock to avoid confusion with differentiating AM versus PM (e.g., 5:00 PM is 17:00).
- Each observer will receive an ortho map of the survey area, containing transect lines or routes and reference waypoints.
- Each observer will receive a data sheet for recording detections.
- Data to record for each detection include:
 - AGE** – AD (adult), YOY (young of the year), U (unknown)
 - SEX** – M (male), F (female), U (unknown and young of the year)
 - BEHAVIOR** (when first observed; can use more than one code) – S = Song, C = call, F = Foraging, FD = flight display, FL = flight, A = agonistic behavior, Al = alert posture (**standing**)

erect with neck extended and appearing vigilant but not singing or calling), FC = food carry, CO = copulation, NM = carrying nest material.

- Data will be entered digitally and submitted to Scott Pearson, WDFW along with copies of field forms and maps.
- Record any incidental nests found (mark location on ortho, coordinates and contents on data form in Notes section).

Streaked Horned Lark Field Survey Form (6 May 2010)											
SITE: _____						Month: _____ Day: _____ Year: _____					
		Full Name		Affiliation/Ph #				start		stop	
Observer 1						Cloud cover (%)				Cloud Cover: 0=0%, 1=33%, 2=66%, 3=100%	
Observer 2						Wind (ave mph)					
Observer 3						Temp (F)				Precip: N=None, R=Rain, F=Fog, D=Drizzle	
Observer 4						Precip.					
						W. meadowlarks				Killdeer	
						Crows					
						Ravens				Record est. abundance of negatively impacting bird species	
						Unknown corvid					
						N. Harrier					
Start time				24 hr							
End time				24 hr							
Total				hrs. min.							
Bird number	Age	Sex	Perp. Distance (m)	Behavior	Notes	Bird number	Age	Sex	Perp. Distance (m)	Behavior	Notes
1						23					
2						24					
3						25					
4						26					
5						27					
6						28					
7						29					
8						30					
9						31					
10						32					
11						33					
12						34					
13						35					
14						36					
15						37					
16						38					
17						39					
18						40					
19						41					
20						42					
21						43					
22						44					
Age: A = Adult, YOY = young of the year, U = unknown Sex: M = Male, F = Female, U = unknown and YOY Behavior (only when first observed; can use more than one code): A= agonistic behavior (chase or aggressive contact), AI = alert posture (standing erect w/ neck extended and appearing vigilant but not singing or calling), C = call, CO = copulation, F = Foraging, FC = food carry, FD = flight display, FL = flight, FS = flushed, NM = carrying nest material, R = resting, S = Song											

Evaluation of the Need for Genetic Enhancement of Puget Lowland Streaked Horned Lark Populations

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Apparent Inbreeding Depression in Puget Lowland Populations of Streaked Horned Lark

Puget Lowland populations of streaked horned lark (*E. a strigata*, STHL) appear to be negatively affected by inbreeding depression which has resulted in reduced fecundity and is contributing to an overall and rapid population decline (Camfield 2010). Of particular concern is the very low hatchability of streaked horned lark eggs which is likely caused by inbreeding. When compared to the hatchability of alpine horned lark eggs, the hatchability of streaked horned lark eggs is significantly lower [$83\% \pm 0.03$ ($n = 61$) hatchability for STHL vs. $92\% \pm 0.02$ for *E. a. articola* ($n = 65$; Camfield et al. 2010)] and is lower than what would expect from birds in general (Koenig 1982). Sites in the Puget lowlands have particularly low hatchability compared to other localities. The hatchability of streaked horned lark eggs at 13th Division Prairie is $0.44\% \pm 0.09$ ($n = 17$). Hatch rates of less than 50% have been routinely observed in a suite of endangered bird species in New Zealand (Briskie and Mackintosh 2004, Congdon and Briskie 2010).

Potential explanations for low hatchability. Low hatchability can result from either a genetic factor, such as inbreeding depression, or environmental factors. Potential environmental factors include calcium deficiency, contamination from pollutants (DDT), and environmental changes which force large percentages of the population to alter typical behaviors (Congdon and Briskie 2010). This explanation seems unlikely because other ground nesting species at the same site and exposed to similar environmental conditions and diets have much higher egg hatchability; Anderson (2010) reported that hatchability was 96% for Savannah Sparrows, and 91% for all ground-nesting grassland birds present on 13th Division Prairie (vs. 44% for STHL) during the same time period. Hatchability could also be influenced by conditions on the wintering grounds but this seems unlikely because streaked horned larks from different breeding locals converge on the wintering grounds (Pearson et al. 2005), yet exhibit markedly different hatching rates among nesting sites.

Information suggesting that inbreeding depression is causing low hatchability include a study by Drovetski et al. (2006), who found that streaked horned larks have “remarkably low genetic diversity” relative to other subspecies – all 32 STHLs shared the same haplotype and, even with small sample sizes, all other localities had multiple haplotypes. Other information consistent with inbreeding include:

- Drovetski et al. (2006) found genetic support for a recent population bottleneck explaining the low genetic diversity in the STHL
- Local breeding populations are now extremely small (Stinson 2005) and there is high site fidelity (Pearson et al. 2008);
- Recent population contraction (Rogers 2000, Stinson 2005)

- 2 cases of observed mother /son STHL pairings(S.F. Pearson unpublished);
- We have only observed evidence of dispersal from the Puget lowland breeding sites and no dispersal into the Puget lowland breeding sites (Pearson et al 2008).

The existence of inbreeding depression suggests that Puget lowland populations may decline very rapidly, and 13th Division Prairie is likely to go extinct without intervention.

Recommended Action and Approach

The potential for the 13th Division Prairie (one of only two native prairie populations) to blink out seems likely given what we know about population demographics (see Camfield et al. 2010 and Schapaugh 2009). An effort to augment or enhance genetic diversity on the 13th Division Prairie seems to be a prudent and urgent action to prevent extirpation due to inbreeding depression. In the literature, attempts to increase the genetic diversity of highly inbred populations are known as “genetic rescue”. Perhaps the most efficient and least disruptive genetic rescue technique is to swap eggs from another population not exhibiting low hatchability. If the fledglings from the healthy population survive and breed at the new site, the local population should benefit from increased genetic diversity, and improved hatchability. Egg swapping has been used successfully between remnant populations of Lesser Prairie Chicken (Westemeier et al. 1991).

Egg swapping requires that nests at the source and receiving sites be monitored closely, so that clutches that are exchanged are at the same stage of incubation to minimize the potential for nest abandonment if adults incubated for an extended period. Another reason to initiate this action next season is the potential to take advantage of efforts by Rand Moore in the Willamette Valley to locate and monitor nests. There apparently are differences in vocalization between the STHL populations in Oregon and Puget Lowland (R. Moore, pers. comm.); this should not inhibit mating, because in most species song details are learned from the parents. However, if there is concern about preserving differences between the populations, the egg-swapping could be 1-way; that is, the eggs would be removed at 13th Division Prairie, but not installed in Oregon and are simply removed (or used to supplement other active clutches locally, if of the same incubation stage). Clutch removal early in the nesting season will likely result in re-nesting by the affected female. Alternatively, eggs could be moved from other sites within Washington (e.g., Columbia River).

Next Steps

We are recommending removing, “*evaluate genetic enhancement of Puget lowland populations*” from the species action plan and replacing this item with, “*develop a proposal to conduct genetic enhancement of the Puget lowland population and conduct an experimental enhancement in the spring/summer of 2011*”.

The proposal would provide the protocol for this action and would evaluate the relative risks and benefits of various alternatives.

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