

(18) It's not about the honey – mitigating airport bird hazards while attracting native pollinators

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Per CFR 139.337, a Wildlife Hazard Assessment (WHA) is necessary after a wildlife-strike triggering events has occurred at a certificated airport. Because triggering events occur multiple times annually at the Seattle- Tacoma International Airport (SEA), a WHA was again conducted in 2011- 12. The results indicated that the Tyee Valley Golf Course (T VGC), that lies adjacent the airfield, attracts hazardous waterfowl and gulls. Consequently, the golf course lease was not renewed and it closed on October 31, 2014. From December 2014 through spring 2015, the golf course greens and fairways were revegetated from grass to more flowering woody-shrub and herbaceous species than had been planted nearly a decade earlier at Call for Papers for 2015 Bird Strike Conference 1 another adjacent site which was formally a farmed wetland. At the farmed site, weekly survey data showed the waterfowl numbers on the ground and flying over the wetlands declined by 91.5% and 83.5%, respectively, from 2004-2010 while the plant canopy became fully established. The end result was a reduction in habitat favored by large hazardous waterfowl while habitat that would benefit the Neotropical songbird species was created. Concurrently, the Port's Wildlife Hazard Mitigation and Conservation Program began a separate project by contracting the nonprofit The Common Acre to setup 3 apiaries near the T VGC to raise public awareness about the need to protect native insect pollinators by using the better known plight of the European honey bee and their link to the human food supply as a means to attract public attention to these other pollinators. With funds available to mitigate the attractiveness of the T VGC to hazardous birds, a combination of plant species were selected that would create sufficient exclusionary vegetation to deter hazardous birds and at the same time would maximize the benefits to pollinators. Surveys to understand the existing species composition of insect pollinator and wildlife using the T VGC was begun in 2014 to obtain a baseline for future comparison. Surveys will continue here in 2015 and beyond to better understand the relationship between habitat management and conservation opportunities while mitigating aviation-related wildlife hazards.

Trageser, H.L., S.D. Osmeck and R. Redmond. 2015. It's not about the honey – mitigating airport bird hazards while attracting native pollinators. Proceedings of the North American Birdstrike Conference 15. 23 pages.

IT'S NOT ABOUT HONEY – MITIGATING AIRPORT BIRD HAZARDS WHILE ATTRACTING NATIVE POLLINATORS

2015 NORTH AMERICAN BIRD STRIKE CONFERENCE
MONTREAL, QUÉBEC, CANADA
WEDNESDAY SEPTEMBER 16TH, 2015
SESSION 7 (4:00 - 4:30 PM)

PRESENTER: HANNAH L. TRAGESER

CO-AUTHORS: STEVE OSMEK AND BOB REDMOND



- Good evening folks! **Thank you so much for giving me the opportunity to speak here tonight.** My name is Hannah Trageser. I'm currently a graduate student studying Environmental Studies at The Evergreen State College in Olympia, Washington. Tonight I will be speaking on behalf of the Port of Seattle.
- **History of SeaTac Wildlife Hazard Management Program**
 - Port hired first Airport **Wildlife Biologist** in '76
 - **For wildlife mitigation** Port converted to shrub-scrub habitat to reduce hazardous geese/gulls **BUT IDEAL HABITAT** for neotropical songbirds (**TRADE OFF**) – non-hazardous
 - **Attracting less-hazardous pollinator species and detracting hazardous avian species**

THE PORT'S CENTURY AGENDA

"...TO BECOME THE CLEANEST, GREENEST, AND MOST ENERGY EFFICIENT PORT IN THE NATION."



2001
RAPTOR STRIKE
AVOIDANCE PROGRAM



2010
RUNWAY DEMOLITION DEBRIS
USED FOR HERP HABITAT



- Working collaboratively with Vancouver and Portland Airport with raptor relocation program
- Juveniles relocated
 - Wing tags and ongoing research with the Falcon Research Group out of Bow, Washington
- 3rd runway mitigation project: create habitat for amphibians, reptiles, and plants with pollinator benefits

SEATTLE-TACOMA INTERNATIONAL AIRPORT (SEA)



- TYEE VALLEY GOLF COURSE (TVGC) IS AT THE SOUTH END OF AND ADJACENT TO THE AIRFIELD FOR DECADES.
- 2012 WILDLIFE HAZARD ASSESSMENT CONDUCTED BY USDA WILDLIFE SERVICES DETERMINED IT WAS A HAZARDOUS WILDLIFE ATTRACTANT.



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FAA ADVISORY CIRCULAR 150/5200-33B

2-7. GOLF COURSES, LANDSCAPING AND OTHER LAND-USE CONSIDERATIONS.

a. **Golf courses.** The large grassy areas and open water found on most golf courses are attractive to hazardous wildlife, particularly Canada geese and some species of gulls. These species can pose a threat to aviation safety. The FAA recommends against construction of new golf courses within the separations identified in Sections 1-2 through 1-4. Existing golf courses located within these separations must

- WE CLOSED THE TVGC ON OCTOBER 31ST 2014.
- ACQUIRED ~\$300,000 TO REVEGETATE IN 2014-15.
- THERE ARE ALWAYS BIRD SPECIES TRADE OFFS WHEN PLANT SPECIES ARE SELECTED.
- POLLINATOR FRIENDLY PLANT SPECIES WERE ALSO CONSIDERED AS HIVES WERE ALREADY PRESENT AT THE TVGC.



AN EXAMPLE: BENEFICIAL HABITAT MODIFICATION AT SEA-TAC

- OPEN WATER WETLANDS ON THE AIRPORT'S WEST SIDE WERE REVEGETATED IN 2006 WITH SHRUB-SCRUB PLANT SPECIES.

2006



2011



(DATA PROVIDED BY PATRICK VIEHOEVER)

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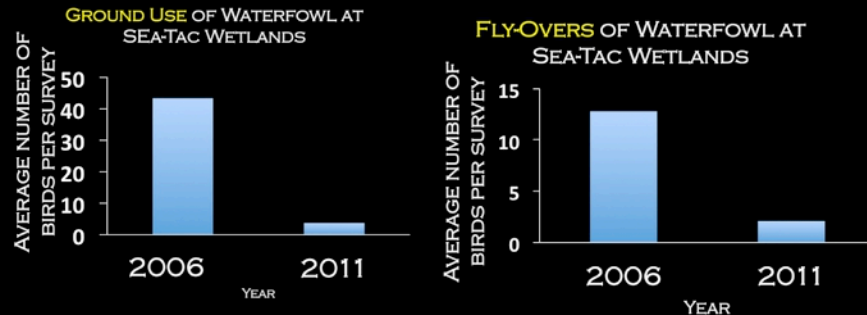
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- **Not included in the results are the neotropical migrants that we know are benefitted from dense shrubs**
- No post-TVGC closure data
- **Success at wetland mitigation sites at POS (decrease waterfowl)**
- **Too early to know for certain what the results would be for waterfowl use at TVGC revegetation sites, but we would expect to have similar level of success with the revegetation plantings at TVGC as the wetland mitigation sites.**

AN EXAMPLE: BENEFICIAL HABITAT MODIFICATION AT SEA-TAC

- DATA FROM THE GROUND AND FLYOVER SURVEYS SHOWED WATERFOWL NUMBERS DECLINED BY 91.5% AND 83.5.
- *THIS DECLINE IN ABUNDANCE IS ASSOCIATED WITH THE ESTABLISHMENT OF DENSE CANOPY COVER.*



(DATA PROVIDED BY PATRICK VIEHOEVER)



- **Not included in the results are the neotropical migrants that we know are benefitted from dense shrubs**
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MEANWHILE...
THE COMMON ACRE

- BOB REDMOND, OF THE COMMON ACRE, APPROACHED PORT COMMISSION IN 2011.
- AIRPORT OPS **CONTRACTED** TCA IN 2013 TO RAISE AWARENESS OF THE PLIGHT OF THE EUROPEAN HONEYBEE (COLONY COLLAPSE DISORDER)
- HONEYBEES ARE USED TO RAISE AWARENESS OF A BIGGER GROUP IN NEED, THE NATIVE POLLINATORS (BUMBLE BEES AND MASON BEES, ETC).

Port of Seattle | AIRPORT OPERATIONS Wildlife Hazard Mitigation & Conservation | THE COMMON ACRE CULTURE & AGRICULTURE

- Bob Redmond – Founding Executive Director of non-profit organization
- **The Port of Seattle contracts Bob**
- **Bob approached Port Commissioner Bill Bryant in 2011 to bring honeybees to airport clear zones, local art exhibit, and build pollinator habitat for wild bees**
- **The Common Acre was one of the first projects to support the Port of Seattle’s vision**
- Wildlife Hazard Mitigation Program → Wildlife Hazard Mitigation and Conservation Program

SEA-TAC AIRPORT ART EXHIBIT

- EXHIBIT AT PORT OF SEATTLE: JANUARY 2014
- ILLUSTRATED THE SIMILARITIES BETWEEN HONEYBEES AND THEIR SOCIAL STRUCTURE AND AIRCRAFT AND AIRCRAFT OPERATIONS.



CELESTE COONING



COLLEEN MONETTE



JED DUNKERLEY



- *Flight Path*
 - Collaboration of The Common Acre & Port of Seattle
 - Attract public attention to the honeybee and its essential role in the human food supply
 - Long-term habitat restoration program at SeaTac
 - 3 apiaries for disease-resistant queen rearing at TVGC

MERGING TWO PROJECTS INTO ONE

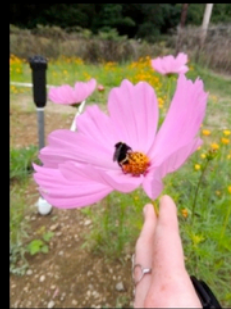
1. WILDLIFE HAZARD MITIGATION

- DENSE SHRUB-SCRUB PLANTS USED TO EXCLUDE HAZARDOUS BIRDS.



2. POLLINATOR ATTRACTANTS

- FLOWERING PLANTS OF BOTH THE WOODY AND HERBACEOUS VARIETIES.



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- **A budget for conservation was established**
- Need to find wildflowers that are drought tolerant and native

TYEE VALLEY GOLF COURSE (TVGC)



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- TVGC, owned by the Port of Seattle, is located on south side of the airfield within the clear zones
- 6 pounds of seed mix with sand to help broadcasting (**Seed mix from Urban Bee is the Xerces Society Pollinator Conservation Seed Mix**)
- **TREES=maple, dogwood & SHRUBS=willow, rose, rhododendron**
- **Yellow=Upland**
- **Green=Wetland/Buffer**
- **Blue=Wildflower Seed Mix**
- **Red/Orange=No Planting**

NEOTROPICAL MIGRANTS

- INTERESTINGLY, THESE BIRDS THAT TRAVEL THOUSANDS OF MILES DURING MIGRATION, MOVE LITTLE ONCE THEY REACH THEIR DESTINATION.



LAZULI BUNTING
(PASSERINA AMOENA)

- THIS MEANS, THERE IS LITTLE THREAT OF THESE SPECIES MOVING TO THE AIRFIELD AND BEING STRUCK.
- IN FACT, THESE SPECIES ARE NOT SHOWING UP IN OUR STRIKE RECORD.





- Other non-picture plantings include: Mexican hat, purple coneflower, blanketflower, lance leaf coreopsis, wild bergamot, poached eggplant, partridge pea, perennial & annual lupine, butterfly milkweed, dwarf sunflower (16 seed types) – non-GMO “Feed the Bee” mix.
- Wildflower **plantings are native but not locally sourced**
 - Northwest Meadow Scapes is the Portland based company where The Common Acre hopes to source TVGC’s LOCAL & NATIVE wildflower seeds soon.
- **Native seed quantity is a definite issue (not enough native seed supply)**
 - **The Port of Seattle & The Common Acre are discussing how to use plantings to save seeds for future needs** (has long term potential, but not currently being implemented now)



- TVGC, owned by the Port of Seattle, is located on south side of the airfield within the clear zones
- Tyee was previously a golf course
- TVGC was up for lease renewal but decided to end its contract
- Port of Seattle purchased TVGC land
- 6 pounds of seed mix with sand to help broadcasting
- Seed mix from Urban Bee is the Xerces Society Pollinator Conservation Seed Mix
- *****TREES=maple, dogwood, SHRUBS=willow, rose, rhododendron*****
- **Yellow=Upland** (Trees=maple, dogwood, Shrubs=willow, rose, rhododendron,
- **Green=Wetland/Buffer** (Trees- maple, dogwood, Shurbs=willow, rose)
- **Blue=Wildflower Seed Mix**
- **Red/Orange=No Planting**

SHRUB-SCRUB & TREE PLANTINGS AT TVGC



NOOKKA ROSE



BALDHIP/DWARF ROSE



MAPLE



WILLOW



RHODODENDRON



DOGWOOD

(IMAGES BY POJAR MACKINNON 1994)



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- Not attracting neotropical migrants
- **Willows provide an exclusionary device for waterfowl not to land on TVGC property**
- Yes there is a tradeoff → Neo-tropical migrants are non-hazardous

PLANT SCHEDULES DATA



- A6 pounds of Herbaceous seed mix
- Significantly more shrubs planted than trees at revegetated TVGC sites
- Shrubs=Willow, Rhododendron, Rose...+ more
- Trees=Maple & Dogwood

ATTRACTING POLLINATORS AT TVGC



PHOTO PROVIDED BY BOB REDMOND



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- Honeybee management at Seattle (3 apiaries), Germany and Chicago
- Use airport site to raise queen bees (A common apiary management practice)
 - Current queen production trial stage underway (this year made 20 queens)
 - Tracking queen success and longevity (**disease-resistance**, hygienic behavior, and gentleness)
 - **Queen** – polygamous → genetic **diversity among** juvenile worker bee **progeny**
 - **Drone** – Males that mate with queen
 - **Worker Bee**– Collect nectar/pollen → bring back to hive
- Honeybees can swarm (hazardous) but wild bees DO NOT swarm (non-hazardous)

POLLINATOR SURVEYS AT TVGC

- CONDUCTED BY BOB REDMOND & EVAN SUGDEN



- ~ 1 / MONTH
- ENTOMOLOGY IDENTIFICATION
- SPECIMEN COLLECTION



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- Bob assists Evan with the collection
- Evan does all the bug species identification in his lab at UW
 - Evan teaches at UW

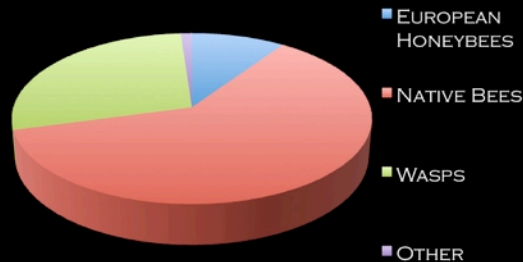


- **New field of study**
 - **Wild bees in industrial non-agriculture setting**
 - **Purpose is to establish a baseline for pollinator communities before the impact of habitat modification takes hold**
 - **Adapting storage techniques and methods**
 - Spring & summer is busy for pollinators
 - Various patterns of species behavior throughout the seasons
1. Count dead bees in bowls (yellow/white/blue bowls attract bees since bees see in UV spectrum) –filled with soapy water solution
 2. Specimens rinsed through a filter screen
 3. Specimen placed on absorbent paper for collection preservation
 4. Specimen placed in alcohol for immediate (temporary) storage
 5. Specimen sent to lab freezer for long term storage

INSECT MONITORING PROJECT RESULTS

LAST YEAR OF ACTIVE GOLF COURSE
BASELINE
SUMMER 2014

- 356 TOTAL SPECIMENS COLLECTED



ROTHMAN 2015



- Pollinator species found on site during year one (2014) (will have year 2 data (2015) at the end of the year)
- Assess the effects of modified habitat (treatments) meant for pollinators
- Results indicate:
 - **TVGC stop mowing → an increase in bees**
 - **A variety of bee species seen**
 - Thorough **BASELINE** generated **for future reference**
 - **Presence/absence goal to see if more pollinators show up**
 - Wild bees dependent on weeds (scrubby habitat) for food source
- Future projections of the project:
 - Once plantings become fully established researchers will be do comparative analysis (find correlations) between pollinator abundance and diversity over next few years (funding permitting)

WILDFLOWER SURVEYS AT TVGC



BOB REDMOND




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- Wildflowers species documented at each test plot location
- Excel spreadsheet
 - Recommended pollinator plants for SeaTac
 - **Genus, Species, Common Name**, Plant type, Max height, Max spread, **Moisture regime, Native, Bloom time, Color**, Propagation/hydroseed, & **Pollinator benefit**



WILDLIFE HAZARD MANAGEMENT SURVEYS CONTINUE





- CONDUCTED BY PATRICK VIEHOEVER & MIKKI VIEHOEVER
- BEGAN IN SUMMER 2000
- AM & PM SURVEYS CONDUCTED TWICE WEEKLY



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- TVGC, owned by the Port of Seattle, is located on south side of the airfield within the clear zones



CONCLUSION

- THE COMMON ACRE KEEPS THE HONEY!
- TRADE OFF HAZARDOUS WILDLIFE FOR POLLINATORS AND SOME NEOTROPICAL AVIAN MIGRANTS
- CONTINUE ADAPTIVE MANAGEMENT APPROACH AND WE WILL MAKE CHANGES AS NECESSARY



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- SEA hopes other airports near golf courses will emulate this habitat modification strategy
- SEA is moving a step in the right direction to minimize bird-aircraft collisions and enhance aviation safety
- There is still room for growth in the Wildlife Hazard and Conservation Program at the Port of Seattle
- Thank you for listening! Questions?