

Prototype I:

I. Determined initial parameters:

- Starting body condition
- Energy cost of flight (a function of distance between patches)
- Patch quality (survivorship)

II. Output variables

- Residence time
- Daily survival estimate
- New body condition
- Life status (dead/alive)

III. Started with just a few patches and moved a duck through those sequentially.

1. Starting Condition of Bird – (Breeding or wintering grounds)

Assumptions:

- o Better breeding (or wintering) grounds > body condition
- o Does previous migration affect starting body condition?

2. Energy Cost of distance flown (Isolated patches of poor quality are sinks (effectively a long distance between good patches))

Assumptions:

- o As distance traveled increases cost increase (energetics)
- o If cost > energy reserves they die at patch

Other sources of mortality during flight?

3. Patch Quality

Assumptions:

- o Patch quality is related to forage quality and amount of disturbance (high, medium, low)
- o As forage quality increase patch quality increases
- o As disturbance decrease patch quality increases

Varying patch quality over time (with bird use)?

Varying patch density relate to energy cost ?

4. Residence Time

Assumption:

- o Quadratic curve relating patch quality to residence time
- o Time spent in patch dependent on arriving body condition and patch quality
- o Patch quality is function of food availability and disturbance (previous step)

Fretwel-Lucas?

Overall migration time constraint?

Maximum residency time (currently 33 days)?

5. Body Condition Gained

Assumption:

- If arriving patch quality < 50 then can only gain proportion of deficit (based patch quality)

Examine energy acquisition rate per day as function of patch quality?

6. Final Body Condition

Assumption:

- Arriving body condition plus body condition gained

No death in patches...yet dead birds fly in the model?

The Model:

		actual		reference								
		Total Residence Time	21		15							
		Total Body Gain	37.5		15							
		Final condition	62.5		0							
		starting body condition	75									
		Life Status	1		0							
Patch ID	Flight Cost	Body Condition Arrival	Distance	Forage Quality	Disturbance	Final Quality	Residence Time	Body Cond Gained	Daily Survival Rate	Patch Survival Rate	Body Condition Depart	Life Status Depart
1											75	
2	25	50	50	1	3	0	1	0	0.995	0.995	50	1
3	25	25	50	1	2	25	20	37.5	0.993	0.86893	62.5	1

Prototype II (Modifications)

3. Patch Quality

In Prototype I we assumed a patch was just a box.

Selected 2 representative species: MALL and CANV (dabbler/diver)

Redefined patch based on individual habitat (n > 22,000)

Prototype III

Patch definition

Changed to federal boundaries (n = 112)

For each patch

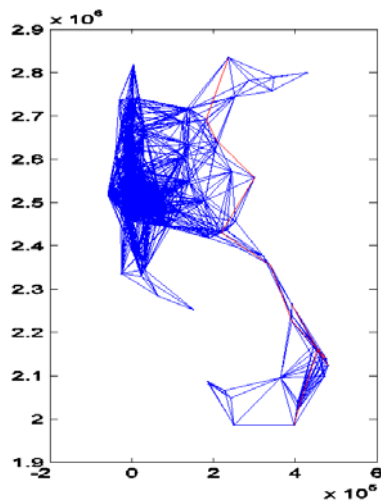
Summed forage values

Summed loafing values

Duck movement thru landscape

More likely to move in N/S

Maximum flight distance limits patch selection



Simulated movement through the mapped patches

Management Implications:

Management response:

- Increase patch quality (increase forage quality, lower disturbance)
- Increase patch density.

Challenge is to optimize recruitment or non-breeding survival via these two options.

Next Steps:

- Refine model to inform mgmt.
- Submit publication

Phase I -

- FY08
- Evaluate & prioritize needs list
- Two one-week meetings to continue prototyping – first being planned for this December.
- Finish next prototype
- Evaluate results

Phase II -

- FY09 to bring in add'l experts & broaden JV/NSST advisory folks
- Hire post-doc
- Refine model
- Develop Decision Support Tools useful for habitat managers.

Budget –

- Phase I = \$10K (travel support & consultant support)
- Phase II = \$85K (Post-doc & consultant support)

Model may serve as a sub-component of larger system-level model.

Model will provide a framework available to apply to JV spatial data useful for unification with other JVs related to migration habitat issues.

PPJV disturbance factor & effects on condition of birds moving south. & impacts to harvest vulnerability.

Model allows us to investigate how big of an issue this phenomenon is.

Need more information needs on bird movements – to relate patch quality & residency time to develop decision rules for DSR & Body Condition.

M. Szymanski - Stochastic weather variable component needed as an add-on to prototyping in future iterations.

\$90K off the table for this year...no “RFPs” going out to entities add to agenda.

A motion was made to request funds from USFWS - DBHC in the amount of \$10K to fund the Migration modeling efforts for phase I (motion passed). Recommendation to be carried to DBHC by R. Johnson.

Action Item: J. Coppen will ensure invitation to S. Mott to the next NSST meeting to discuss future funding to support NSST on projects.

Evaluating Population and Habitat Management through the Annual Life Cycle: Mississippi Flyway GPS Satellite Telemetry Project: (Presentation by S. Cordts)

Mississippi Flyway efforts to evaluate GPS Satellite telemetry (handout)

Fine-scale data with 22g GPS solar units – pilot study conducted. Can put a bird on a small wetland. Hits 1-6 per day or more.

3 radios were deployed (2 hens & 1 drake MALL). Allowed life-cycle spatial movement mapping. 400 locations ($n=1$). Drake was assumed not paired.

Advantages for informational - Transitional probabilities & accuracy of movement patterns.

Radios (solar powered) provide annual life cycle data.

Sample size issues need to be ironed out. Study proposal needs to be reviewed to assess NSST support.

Action Item: A review of the proposed Mississippi Flyway mallard GPS satellite telemetry study, presented by S. Cordts, will inform needs for NSST endorsement.

Review team = M. Petrie, J. Dubovsky, G. Soulliere, R. Reynolds. Review team will report at next NSST meeting.

Large-Scale Monitoring Variables to Assess Net Landscape Change - Habitat Gains & Losses.

R. Reynolds - All JVs will have habitat population objectives. Purpose should include providing info. that JVs need to assess net progress to meeting habitat objectives. Need a focus as to where, during the annual life cycle, limitation & regulation act most strongly. We'll need alternative models that capture uncertainty about these spatial & temporal dynamics.

Need information that is useful for planning purposes, not evaluation purposes. Need capability for monitoring beside NWI "snapshots". Need to monitor trends for gains & losses.

Question is "*What do we want to monitor & why?*" Basis of the discussion includes limiting factors.

This approach needs to be a waterfowl conservation region- (WCR) specific assessment of needs. What are the most important landscape features we need to assess and why? For example, "*I need to attract pairs & produce ducklings.*"

M. Anderson - Ultimately, is it that we need to bring our monitoring needs to table & find opportunities to work together & share data?

Need to feed the decision-cycle for updating JV Implementation Plans and how information on net landscape change feeds into that cycle assessment; We could all ID those key metrics we need to facilitate that.

R. Reynolds - Details need to be developed via modeling at the JV-level.

Our goal is not to develop National datasets - our goal is to come up with a National estimate of change in habitat capacity to sustain population goals for a given year.

A "roll-up" will be a challenge. JV differences creates problem given issues like monitoring change in absence of a baseline. Landscape change with "X" result (everybody being "different") is the overall aspect of the issue.

Need to identify key habitats that JVs need to restore/enhance/protect. This should be monitored JV-by-JV to produce measurable changes that relate to a JV's Implementation Plan goals.

M. Gloutney - Adjacent JVs will need common currencies to allow some comparability. May need to prioritize amongst important habitat types considering impacts of limiting factors.

R. Johnson - We need to agree to scale of assessment & first product we get out.

At a WCR scale, JV modeling efforts would include a need to assess what needs to be collected. This needs to be articulated in next update and this can be useful to scale up to continental evaluation.

M. Pertie - Let JVs decide what they need to monitor...but to roll this up, is there value to standardization to facilitate a roll-up?

R. Johnson - Are we asking JVs to assess changes in key habitat types or a habitat's capacity to sustain ducks?

R. Reynolds - We need to address "*What & Why?*" - Then address the "*How?*" This is about JVs monitoring key habitats to evaluate impacts of net landscape change.

M. Anderson – Expressed concern regarding a National roll-up for these JV monitoring efforts. This provides a valuable opportunity to form a picture of gains & losses across continent.

R. Reynolds - More informative at JV level.

M. Anderson - Getting it right at JV level is the key. When we get to the "*How?*" NSST needs to engage. Defining what you need in terms of information is where JVs need to deliberate.

R. Reynolds - NSST can deliberate regarding some type of inventory and the priorities we need to focus on; and use NWI information as part of the spatial picture representing the needs.

T. Jones - How many JVs have the capabilities to estimate habitat change every 5 years? (Several did).

R. Reynolds - We have 1979-82 NWI data in PPR. There are some inventory concerns for some areas but lots of field time is spent to verify habitat conditions.

B. Sullivan – Reviewed influence of cropping to wetland changes (PLJV croplands example); A sample-based approach to assess capacity to feed ducks could be developed. Cropland-level spatial data would be useful.

R. Johnson - NSST needs to communicate its assessment data needs to USDA or FSA for use in NAWMP landscape assessments.

Other avenues (i.e., a non-binding MOU) may be all that's needed that addresses the JVs needs in some circumstances.

Need a listing of specific criteria needed for each JV that could be placed in letter as a justification.

Need to compile, for those JVs that do, how all JVs assess landscape change to look for utilities for other JVs and to determine data gaps.

R. Johnson – For the next NSST meeting, get all JVs to provide data monitoring plans, list of variables, anticipate approaching sampling design for assessment, what existing data sets JVs need access to in order to make this a reality - perhaps power analysis/sample size estimates. Get reports from all JVs compiled to be used as a framework for discussion.

T. Jones - Need an *a priori* formatted form for JVs to fill out. Need the detail to format the letter appropriately, so we know what we are asking for.

Need a communication to JV Coordinators, perhaps from S. Mott, asking JVs to identify major habitats identified in models in JV Implementation Plans that need to be monitored for net changes.

Action Item: J. Coppen will follow up and coordinate with S. Mott regarding a communication to JV Coordinators asking them to identify major habitats that need to be monitored for net changes.

Need to ask JVs what their current capacity is to address the need. Need to develop a “survey framework” for JVs to respond to.

Action Item: M. Gloutney and T. Jones will develop a framework template for JV responses.

Need a letter drafted by NSST Executive Committee to be addressed from PC to communicate to the USFWS Director the assessment data needed from partners for evaluating impacts of USDA & FSA via changes in croplands to migratory bird populations. **Letter drafted by NSST Executive Committee for PC should be based on results of the survey to JVs on habitat monitoring needs to assess net change.** PC could develop MOUs.

Action item: NSST Executive Committee will develop a draft letter from Plan Committee, addressed to Dale Hall, to facilitate FWS Director’s needs to reach out to USDA or FSA director regarding agreements with USDA or FSA for use of their assessment data for NAWMP landscape assessments.

K. Fleming –USFWS-Population and Habitat Assessment Branch (PHAB) could assist by developing a white paper on a sampling framework to detect change in waterfowl habitat – guidelines for now until we understand landscape layout. PHAB could develop a generic white paper, or JVs could come to PHAB for help in exercises. She expressed willingness to help out in more one-on-one scenarios with JVs.

J. Coppen - NSST will meet with PC during third week of January 2008 in Memphis, TN. A full NSST meeting will be planned before the joint meeting. NSST needs to discuss background information & needs feedback to refine issues we are trying to deal with. Meeting framework for next meeting will include first ½ day for working groups to meet face-to-face → next day we’ll have a full NSST meeting → next day joint PC/NSST meeting.

Action Item: J. Coppen will draft NSST agenda for next NSST meeting.

Adjourn.