Pheasant News and Notes
May 2023

Trivia Question
True or false: pigments called anthocyanins give the blue and green feathers on a rooster pheasant's head their color.

USDA and Legislative News
Legislative jockeying around the upcoming Farm Bill continues. For example, it was reported that Senate Agriculture Committee ranking member John Boozman (R-AR) proposed rescinding some of the nearly $20 billion of Inflation Reduction Act funding for climate-smart conservation practices and moving at least some of it into baseline funding for the Farm Bill going forward. Conservation title programs like CRP and EQIP could see a long-term benefit if their baseline funding gets raised, but there is no certainty about where within the Farm Bill's several titles and many programs the rescinded funding would flow. Chairwoman Debbie Stabenow (D-MI) appears opposed to the concept.

The Farm Service Agency announced the start of the 2023 Grassland CRP signup on April 17th running through May 26th. As we noted last month, there was a lot of discussion at the recent North American Wildlife and Natural Resources Conference about the rapid rise in Grassland CRP acres the last two years and the potential competition with "traditional" CRP practices under the current national acreage cap should demand for traditional practices improve. The wildlife community asked FSA to explore ways of making Grasslands enrollments more competitive without dampening landowner enthusiasm for the program. We'll see if any meaningful changes were made when the results of the signup are announced later this year.

FSA also announced guidelines for re-enrolling land in expiring Soil Health and Income Protection Program (SHIPP) contracts. You may recall that SHIPP was a pilot program available in the Prairie Pothole states of Iowa, Minnesota, Montana, North Dakota, and South Dakota that experimented with the concept of a cheaper, shorter-term (3- to 5- year contract length) CRP that would have greater appeal to both policymakers and landowners. Unfortunately, it was rolled out at a time when general demand for CRP was low, so only 3,294 acres (out of 50,000 authorized) were enrolled during the 2018-2020 signup period. A few of those contracts are now expiring, so FSA is giving guidance about shifting those lands into other qualifying CRP practices if the landowner so desires.

That low enrollment number will surely be read as a failure of the SHIPP concept. I heard several opinions about why it failed (rental payments were too low, Pheasants Forever offered a more attractive program for those in the Dakotas with sodic soils, etc.) but it would have been interesting to see if the same result would have happened in a period of low commodity prices. Sometimes timing is everything.

Notes from Around the Pheasant Range
Spring has sprung, and our thoughts now turn to breeding season surveys and figuring out how well the birds fared through the winter. The states that count crowing pheasants have just started their surveys

so it will be a while before an answer appears. We heard on our monthly Technical Committee call this week that some early routes in North Dakota looked better than feared, but some in the still-dry Kansas range were less than exciting. We hope everyone is greeted with good news when all the data are in.

Yet another round of congratulations to retiring Pheasants Forever CEO Howard Vincent, who was presented with the Theodore Roosevelt Conservation Partnership's 2023 Capital Conservation Award last month in Washington, D.C. Well-deserved by all accounts!

I've been working on some tools to help predict the effects of gaining, losing, or redistributing CRP acres within a given state. Such predictions rely on mathematical equations (models) that relate proportional land cover (percent CRP, cropland, trees, etc.) to pheasant abundance. The tools themselves aren't quite ready for public distribution (although I've shown drafts to our partnership's Management Board and Technical Committee), but I can share a few things I've learned about the models behind them.

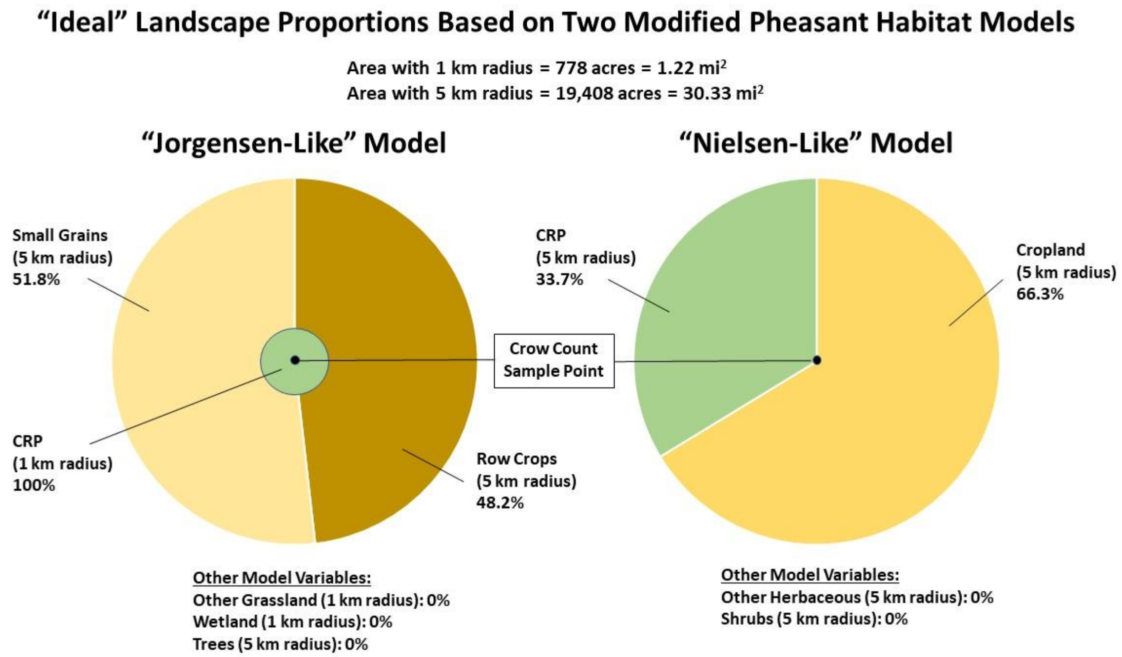
The partnership would ultimately like to develop its own models for this purpose, but for now we are relying on two that have been published in the scientific literature. The models of Jorgensen et al. (2014) and Nielsen et al. (2008) are both based on observations of land cover around survey points for crowing male pheasants – Jorgensen used individual Nebraska point counts directly, while Nielsen used 50-stop total counts for North American Breeding Bird Survey routes in the western half of the pheasant range (at the time, they didn't have access to CRP spatial data from all states). Jorgensen's final model predicted counts based on land cover within a 1-km radius (percent CRP, other grassland, and wetland) and a 5-km radius (percent small grains, row crops, and trees) around points, whereas Nielsen's model used land cover (percent CRP, cropland, other herbaceous vegetation, and shrubs) at a 1-km radius around entire 24.5-mile routes.

I modified both models from their published forms to get them work well together in the tools, most notably by applying Nielsen's route-based model to a 5-km radius area around single points. Because of these changes, the models are probably best referred to as "Jorgensen-like" and "Nielsen-like" to underscore the differences from the published works.

So what can we learn from these models? First, like all models they are simplified abstractions of a complex reality, so their predictions should be viewed with an abundance of caution. The statistical methods used to construct them appear sound, but the data used to train them were limited – Jorgensen's data set was from "only" a few hundred sample points over three years in Nebraska, and Nielsen's data set used counts collected mostly in early June, which is long after the peak pheasant crowing season has ended.

That said, these models represent the best available information we have about land cover relationships with pheasant abundance. After applying them to thousands of points across the pheasant range in the past few weeks, both models seem to agree on some important points: 1) pheasants respond positively to CRP within cropland-dominate landscapes; 2) pheasants respond to cropland in a "Goldilocks" kind of way – a moderate amount is good, but too much or too little is bad, and 3) in rangeland-dominated landscapes, converting relatively scarce cropland into CRP is probably counterproductive to pheasant abundance.

Beyond these take-aways, I wondered what the models "perceived" as the perfect landscape conditions for pheasants, defined as the set of land cover proportions that yielded the highest possible predicted crow count for each model. To find out, I asked the computer to simulate one million landscapes with random proportions of the habitat types each model used in its predictions, then to calculate the predicted pheasant abundance values for each. After some additional wrangling (it turns out a million runs wasn't enough), the proportions in the figure below seemed to maximize predicted counts.



Both models view an “ideal” landscape as consisting of some combination of CRP and cropland, and nothing else. Jorgensen found a stronger association between pheasant abundance and CRP within 1 km of their sample points, so their multi-scale model favors concentrating all of an area's CRP into that inner core. Nielsen only looked at one scale, so their model favors a 1:2 CRP-to-cropland ratio at whatever scale the model is applied to (in this case, within a 5-km radius).

Two key points: 1) actual land cover around both researchers' original sample points was nowhere near as extreme as these so-called “ideal” landscapes, so we are making predictions for landscape compositions that extend far past where the training data stopped; this is always dangerous and usually frowned-upon; and 2) since these models are based on counts of crowing roosters, they probably don't reflect the year-round needs of entire populations; different survey data (e.g., brood counts, winter counts) would no doubt yield different results.

Shortcomings and all, these models remain the most defendable way to answer our “what if” questions regarding pheasant reactions to a changing environment. Developing better models and more user-friendly tools to wring information out of them would give us better answers and elevate our credibility, which is why these tasks remain our partnership's highest priorities. More on those to come.

Pheasant-relevant Media

Manchin, Moore, Humphries, and Vincent receive TRCP's Conservation Awards
Washington researchers to conduct drone flights for turkey and pheasant monitoring
Poynette game farm ensures healthy pheasants for hunting
What conservation measures should be included in the 2023 Farm Bill?
Want fiscal responsibility? Stop paying wealthy farmers.
Art student creates children's book about Chaska Fire Department pheasant
Dogs may be at risk from high levels of lead from shotgun pellets in raw pheasant dog food, study finds
Smoke some weeds: lasers could make herbicide obsolete
Scientists challenge US wildlife director's qualifications
Conservation groups fight back against Biden admin's 'misguided' regulation efforts on hunting, fishing
How the world's favorite conservation model was built on colonial violence

Recent Literature

Fino, S. R., L. M. Gigliotti, A. T. Pearse, and J. D. Stafford. 2023. Landowner and biologist perceptions of game bird predators and management. Wildlife Society Bulletin (early online version).

Asgharzadeh, M., et al. 2023. Disentangling the impacts of climate and land cover changes on habitat suitability of common pheasant *Phasianus colchicus* along elevational gradients in Iran. Environmental Science and Pollution Research (online version).

Tajchman, K., et al. 2023. The screening method for use of wild pheasant feathers in the monitoring of environmental pollution with heavy metals. Scientific Reports 13:6540.

Scholl, E. M., et al. 2023. Habitat preferences and similarities of Grey Partridges and Common Pheasants in agricultural landscapes under organic and conventional farming. European Journal of Wildlife Research 69:29.

Behney, A. C. 2023. Are breeding activities risky for northern bobwhites? An assessment of survival costs of reproduction. Journal of Avian Biology (early online version).

Turner, M. A., B. L. Powell, J. W. GeFellers, J. T. Bones, S. G. Marshall, and C. A. Harper. 2023. Sericea lespedeza control with postemergence and preemergence herbicide applications in fields managed for northern bobwhite. Wildlife Society Bulletin (early online version).

Green, R. E., et al. 2023. Voluntary transition by hunters and game meat suppliers from lead to non-lead shotgun ammunition: changes in practice after three years. Conservation Evidence Journal 20:1–7.

Stevens, B. S., S. B. Roberts, C. J. Conway, and D. K. Englestead. 2023. Effects of large-scale disturbance on animal space use: Functional responses by greater sage-grouse after megafire. Ecology and Evolution 13:e9933.

Braga, P. H. P., et al. 2023. Not just for programmers: How GitHub can accelerate collaborative and reproducible research in ecology and evolution. Methods in Ecology and Evolution (early online version).

Trivia Answer

False. The iridescent blues and greens on a pheasant's head are examples of structural rather than pigment-based colors. Researchers recently found that the thin outer layer of the feathers (the keratin cortex) controls the appearance of the feathers – the thinner the cortex, the shorter the wavelength of refracted light seen by the observer. They were able to turn the pheasant's green feathers blue, and the blue feathers violet, by chemically thinning the cortex.

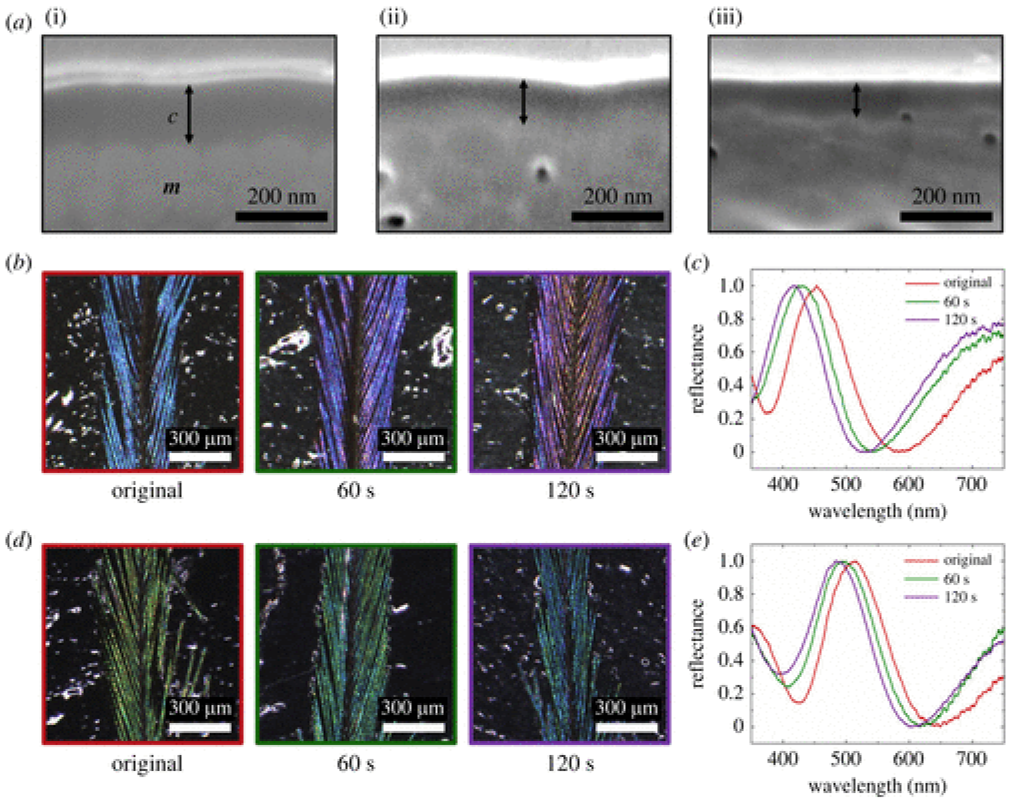


Figure 3. Colour changes after etching the keratin cortex. (a) Keratin cortices with different thicknesses after etching of a blue barbule. Electron micrographs of the barbule etched with an oxygen plasma for 0 s (original) (i), 60 s (ii) and 120 s (iii), respectively. The solid arrows represent the keratin cortex thicknesses (keratin cortex (c) and melanosome (m)). (b) Optical micrographs of original blue barbules and barbules etched for 60 or 120 s. (c) Corresponding normalized reflectance spectra of blue barbules. (d) Optical micrographs of original green barbules and barbules etched for 60 or 120 s. (e) Corresponding normalized reflectance spectra of green barbules. Compared with original barbules (red boxes and lines), the reflectance peaks of barbules etched for 60 s (green boxes and lines) or 120 s (purple boxes and lines) had blue shifts. Unnormalized reflectance spectra are shown in the electronic supplementary material.

This update is brought to you by the National Wild Pheasant Conservation Plan and Partnerships. Our mission is to foster science-based, socially-supported policies and programs that enhance wild pheasant populations, provide recreational opportunities to pheasant hunters, and support the economics and social values of communities. You can find us on the web at https://nationalpheasantplan.org.