Pheasant News and Notes

January 2021

Trivia Question

Of the states with at least 100,000 acres currently enrolled in CRP, which has lost the highest percentage of its peak enrollment in "traditional" CRP (that is, excluding CRP Grasslands enrollments)?

Farm Bill and USDA News

The 2021 general CRP signup is now underway through February 12th, although the state and county offices still need training and software before they can start officially entering offers. USDA also sweetened the pot for continuous CRP offers by upping some incentive payments, which is welcomed. However, as we have said before, signups are going to have to be spectacularly successful if we are going to climb out of the hole we are currently in, and large acreage expirations in 2021 and 2022 are looming (see the table at the end of this document).

Jim Inglis and Bethany Erb did a great job summarizing some recent conservation discussions in pre-riot D.C.; you can take a look here.

Notes from Around the Pheasant Range

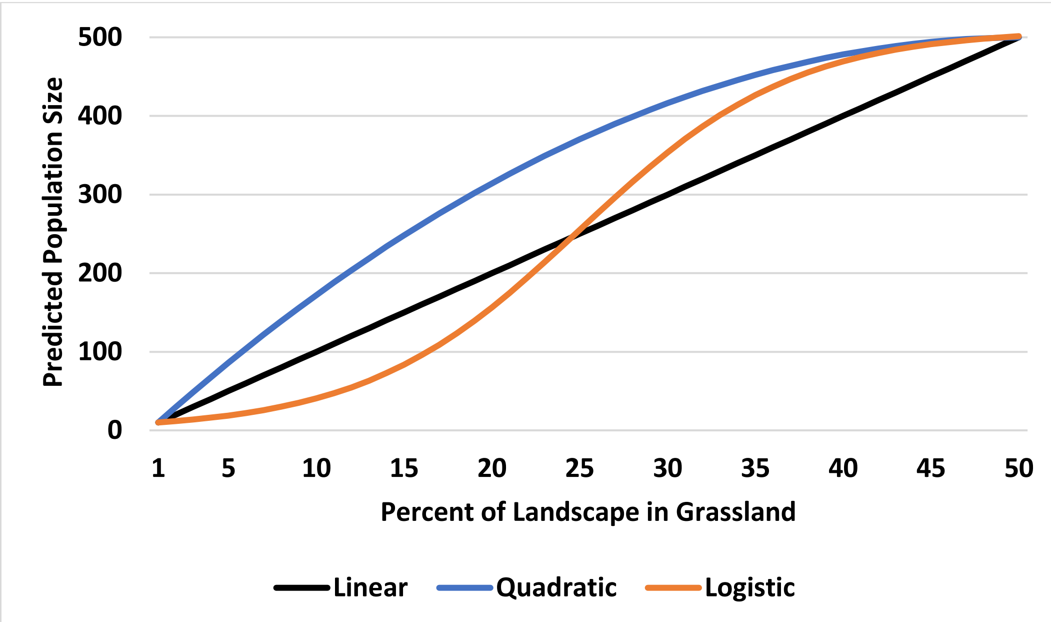
The Technical Committee and I have been steadily working on the second edition of the National Pheasant Plan. For me, part of that work has included thinking about the economic aspects of pheasant management from the perspective of an agency or organization hoping to maximize their return-on-investment. Two key questions in this area are 1) how do we maximize the pheasants produced per dollar spent (or acre of habitat created), and 2) how do we maximize the hunters retained per pheasant produced?

Working through these issues has been interesting in terms of challenging what I thought I knew about pheasant-habitat relationships. The Plan will go into more detail, but I thought I would share a few graphics related to those questions.

First, we know that more habitat equals more pheasants, but *how* populations rise and fall as habitat increases and decreases can have a big impact on ROI. I assumed that agencies can easily figure out how much different options cost, so it is the "birds produced per acre" and "hunters retained per pheasant produced" variables that are of primary concern.

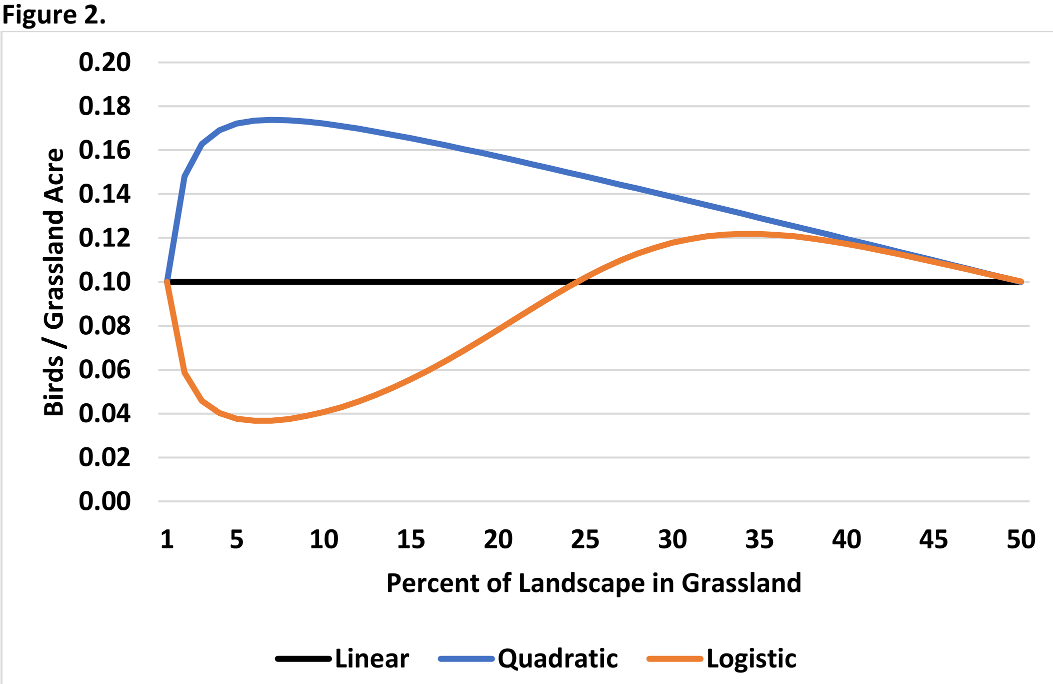
Figure 1 shows three hypothetical relations (models) depicting population size and proportion of habitat in the landscape. All adhere to the "more habitat equals more pheasants" rule, but differences in abundance per increment of habitat vary. They are all configured to hit a maximum abundance at 50% habitat, with a fifty-fold difference in abundance from 1 to 50%.

Figure 1.



If we convert these curves into birds per acre *of habitat* (not just birds per acre), the curves diverge considerably (Figure 2). I used an initial density of 0.1 birds per acre of habitat at 1% habitat in the landscape. You will notice that the linear model predicts the same birds per acre of habitat regardless of baseline habitat percentage, suggesting ROI is constant regardless of baseline landscape condition (assuming costs are flat). But the other models predict big differences in ROI, particularly at lower percentages of habitat in the landscape.

Figure 2.



So which curve best reflects reality? Given that all could be wrong or right to some degree depending on the landscape, I looked at four different habitat models in the literature to see what emerged. Figures 3 and 4 show model predictions when the percentages of habitat (in this case, CRP) increase at the expense of cropland. Models used in predictions were from Riley 1995 ("IA"), Haroldson et al. 2006 ("MN"), Nielson et al. 2008 ("West"), and Jorgensen et al. 2014 ("NE"). Results for "MN" are the average of two reported seasonal models, and those for "NE" and "West" models largely overlap at the scale shown so the lines are hard to see. Predictions assume an initial population of 10 pheasants (0.1 per acre of CRP) at 1% CRP in the landscape. I limited the predictions to landscapes up to 15% CRP because that is where most of the data in the studies came from.

Figure 3.

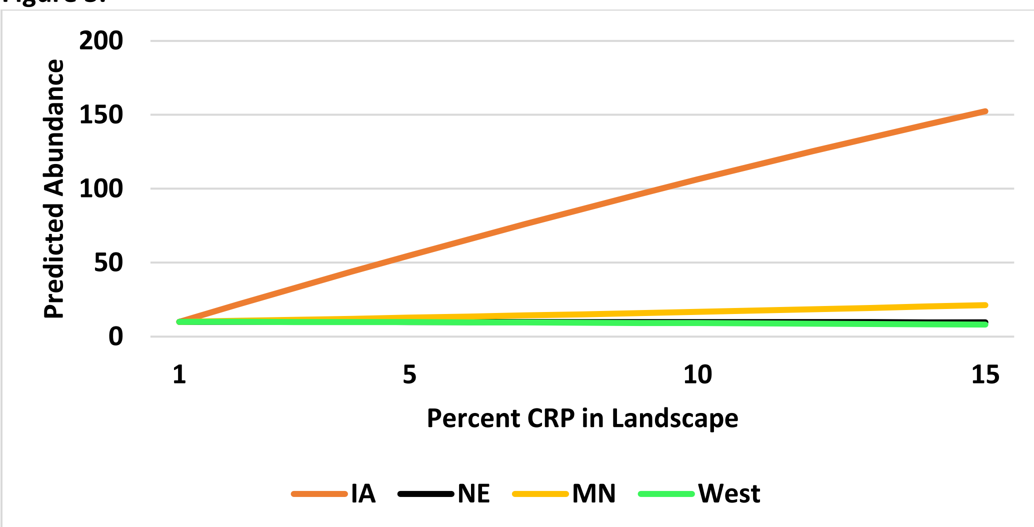
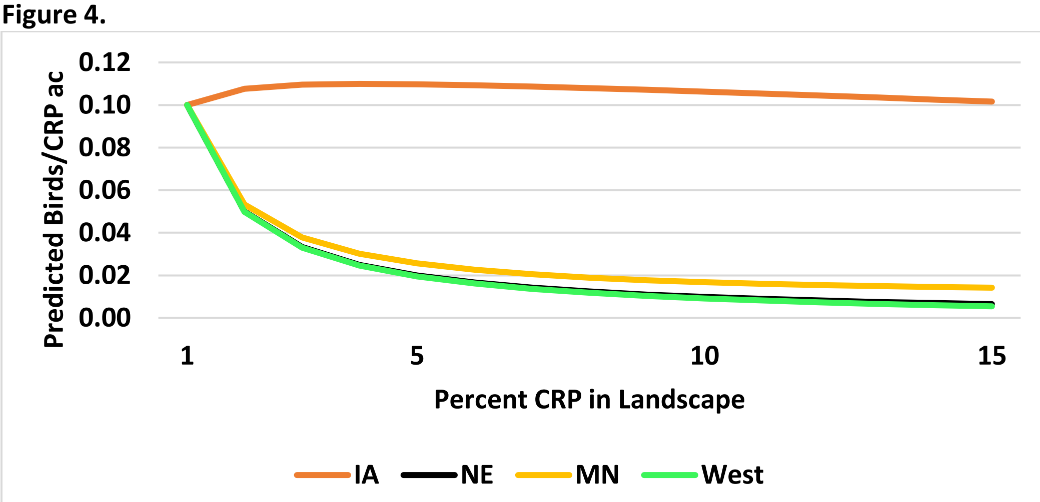


Figure 4.



The Iowa model is the only one that comes close to conforming to expectations; it has a quadratic shape (though it looks linear at this range of x-values) and predicts about a 15-fold change in populations between 1 and 15% CRP in the landscape. By comparison, the other models predict miniscule changes in abundance as percent CRP increases over that range, with birds per CRP acre declining as percent CRP increases.

These three models left me scratching my head, and I am pretty sure I got the model math right. USDA-FSA funded the Nielson et al. paper and said their results suggested "a 4% increase in CRP was associated with a 22% increase in pheasant counts," which sounds great, and my math reproduced these results. The paper uses land cover compositional data as its model inputs, so a "4% increase in CRP" means increasing the percentage of the landscape that is CRP by four points, i.e., from, say, 5 to 9%. Such a change would increase the CRP *acres* in the landscape by ((9-5)/5)*100 = 80%, but only yield a 22% increase in populations. The model therefore predicts a decline in birds per CRP acre as the proportion of CRP in the landscape increases (assuming habitat selection behavior remains stable), and several other models share this prediction.

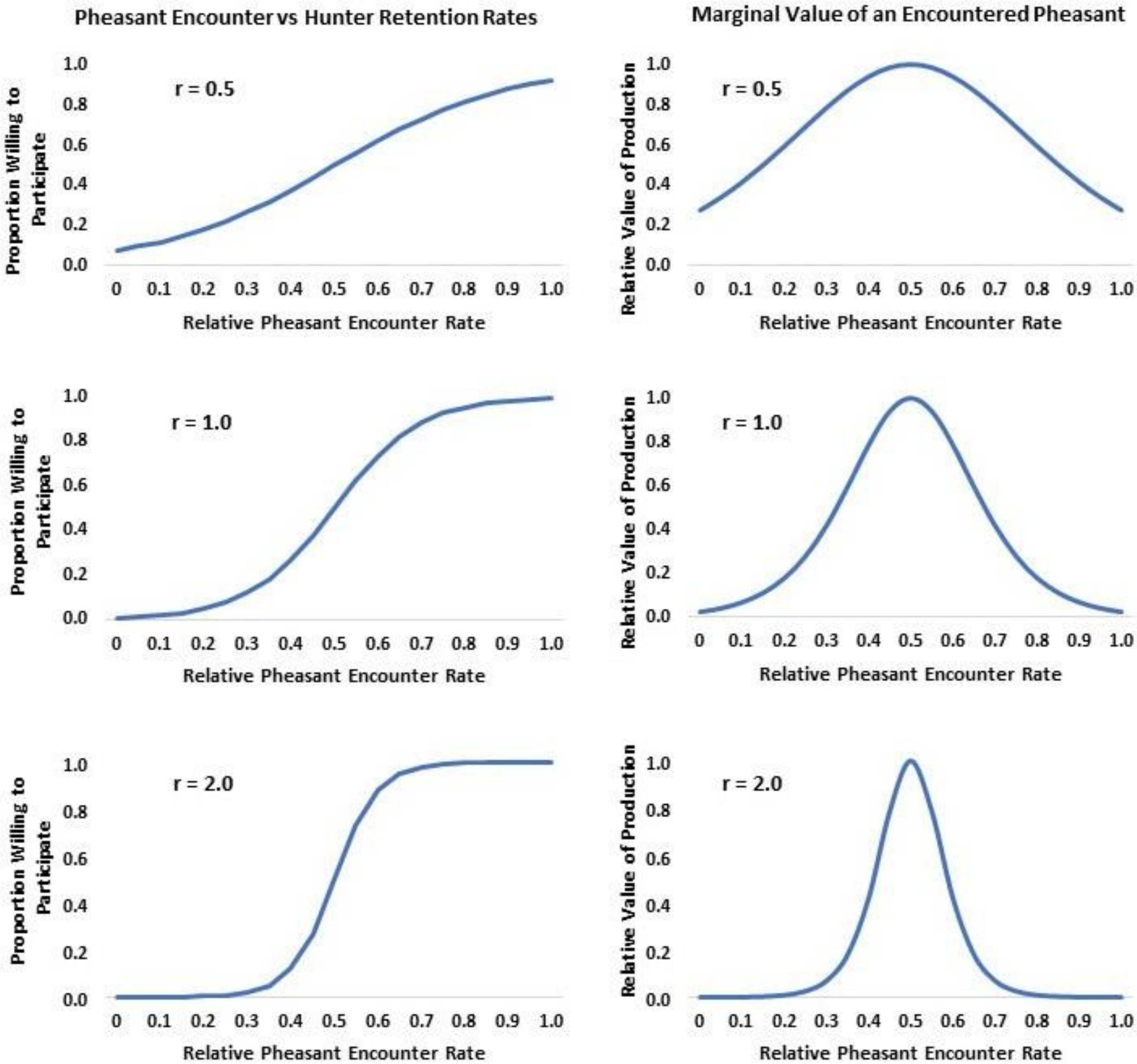
This is not how I expected the world to work. Either my preconceptions are wrong (I thought birds per acre of habitat should increase, or at worst remain stable, with increasing habitat in the landscape), my math is wrong, or most of these models are misleading. The answer to these questions could have a big impact on the efficiency with which we can do our work. If anyone has any insights about this, please let me know.

One last bit about maximizing hunters retained per pheasant produced. We know some hunters are going to drop out regardless of pheasant abundance, but for those that might continue, imagine asking each one how many pheasants they would have to encounter per day to keep participating. We could then compile their collective answers and estimate the proportion of hunters who were willing to participate at any given pheasant encounter rate. The shape of that "cumulative proportion" distribution can then be used to find the maximum value of additional pheasants added across the range of encounter rates. Figure 5 shows three such possible shapes (the r-value describes the growth rate of the cumulative proportions) and how they affect where that maximum value lies, as well as how sharp the distinction is between the maximum and other nearby values.

Two messages emerge from this hypothetical exercise: 1) the less agreement there is among hunters regarding the number of birds they need to see to keep participating, the less it matters exactly where you add additional pheasants, and 2) adding pheasants into landscapes offering very low and very high encounter rates is of little retention value compared to more moderate encounter situations. These ideas are obviously in great need of real data to test their validity and see where these high-yield encounter rate values might actually occur.

The Technical Committee and I will be sorting through these ideas before deciding which belong in the revised Plan. If anyone has comments, feel free to send me a note.

Figure 5.



Literature Cited

Haroldson, K. J., R. O. Kimmel, M. R. Riggs, and A. H. Berner. 2006. Association of ring-necked pheasant, gray partridge, and meadowlark abundance to CRP grasslands. Journal of Wildlife Management 70: 1276-1284.

Jorgensen, C. J., A. A. Bishop, J. J. Lusk, L. A. Powell, and J. J. Fontaine. 2014. Assessing landscape constraints on species abundance: does the neighborhood limit species response to local habitat conservation programs? PLoS ONE 9:e99339.

Nielson, R. M., L. L. McDonald, J. P. Sullivan, C. Burgess, D. S. Johnson, D. H. Johnson, S. Bucholtz, S. Hyberg, and S. Howlin. 2008. Estimating the response of ring-necked pheasants (*Phasianus colchicus*) to the Conservation Reserve Program. Auk 125: 434-444.

Riley, T. Z. 1995. Association of the Conservation Reserve Program with ring-necked pheasant survey counts in Iowa. Wildlife Society Bulletin 23:386-390.

Pheasant-relevant Media

Research looks into different farmer types regarding soil, water conservation

Sioux Falls loses a few million dollars with cancellation of Pheasant Fest

(Sorry, it was slim pickings on Google this month.)

Recent Literature

Runia, T. J., and A. J. Solem. 2020. Captive ring-necked pheasant response to very high experimental doses of lead. Prairie Naturalist 52:70-77. (For those without a PN subscription, contact Travis Runia for an electronic copy)

Hinrichs, M. P., M. P. Vrtiska, M. A. Pegg, and C. J. Chizinski. 2020. Motivations to participate in hunting and angling: a comparison among preferred activities and state of residence. Human Dimensions of Wildlife (early online version).

Upadhaya, S., G. Arbuckle, and L. A. Schulte. 2020. Developing farmer typologies to inform conservation outreach in agricultural landscapes. Land Use Policy (early online version).

Nemeth, N. M., L. M. Williams, A. M. Bosco-Lauth, P. T. Oesterle, M. Helwig, R. A. Bowen, and J. D. Brown. 2020. West Nile Virus infection in ruffed grouse (Bonasa umbellus) in Pennsylvania: a multi-year comparison of statewide serosurveys and vector indices. Journal of Wildlife Diseases (early online version).

Tallamy, D. W., and W. G. Shriver. 2021. Are declines in insects and insectivorous birds related? Ornithological Applications (early online version).

Smith, A. C., and B. P. M. Edwards. 2020. North American Breeding Bird Survey status and trend estimates to inform a wide range of conservation needs, using a flexible Bayesian hierarchical generalized additive model. The Condor (early online version).

Trivia Answer

Montana has lost 79.4% of its maximum "traditional" CRP acres as per USDA's November 2020 CRP report, the most of any state with a current enrollment of more than 100,000 acres. The table below defines "traditional" CRP acres as all enrollments excluding CRP Grasslands contracts, which began in 2015. CRP Grasslands enrolls land currently in grassland and allows annual haying and grazing if certain conditions are met, so likely has less value to pheasants than traditional CRP.

	"Traditional" CRP Acres			Acres Expiring	
State	**Maximum**	**Nov 2020**	**% Change from max**	**2021**	**2022**
Alabama	555,523	163,008	-70.7	45,124	49,125
Alaska	29,984	8,184	-72.7	33	134
Arizona	33	0	-100.0	0	0
Arkansas	251,166	207,378	-17.4	21,946	19,625
California	182,185	38,479	-78.9	8,596	16,470
Colorado	2,472,094	1,433,918	-42.0	298,852	463,968
Connecticut	318	0	-100.0	1	0
Delaware	7,906	3,342	-57.7	337	148
Florida	128,584	14,367	-88.8	4,550	7,109
Georgia	616,501	191,751	-68.9	26,672	54,974
Hawaii	4,887	1,280	-73.8	0	0
Idaho	848,591	432,317	-49.1	116,543	143,309
Illinois	1,086,580	832,923	-23.3	68,756	68,415
Indiana	453,481	204,236	-55.0	18,938	21,495
Iowa	2,203,794	1,670,340	-24.2	90,227	120,112
Kansas	3,258,989	1,722,419	-47.1	369,500	298,644
Kentucky	437,554	188,890	-56.8	13,435	58,338
Louisiana	327,367	257,821	-21.2	26,604	13,238
Maine	35,790	4,427	-87.6	1,087	1,145
Maryland	85,734	45,551	-46.9	3,338	4,962
Massachusetts	121	10	-91.7	0	0
Michigan	334,605	98,102	-70.7	9,677	10,908
Minnesota	1,836,818	992,306	-46.0	63,155	107,581
Mississippi	955,119	552,672	-42.1	79,343	102,092
Missouri	1,701,712	794,525	-53.3	133,824	236,060
Montana	3,481,533	715,722	-79.4	138,264	193,556
Nebraska	1,379,741	673,870	-51.2	96,893	81,823
Nevada	2,828	0	-100.0	146	0
New Hampshire	197	0	-100.0	0	0
New Jersey	2,639	1,694	-35.8	170	328
New Mexico	597,492	318,791	-46.6	114,769	126,122
New York	66,544	15,720	-76.4	2,410	2,787
North Carolina	143,723	35,028	-75.6	9,821	8,657

North Dakota	3,388,553	1,178,447	-65.2	134,443	381,099
Ohio	365,983	221,473	-39.5	26,956	24,031
Oklahoma	1,170,355	491,210	-58.0	153,562	157,908
Oregon	567,565	468,289	-17.5	85,468	83,354
Pennsylvania	230,219	100,582	-56.3	12,866	20,159
Puerto Rico	2,223	495	-77.7	0	0
Rhode Island	28	0	-100.0	0	0
South Carolina	267,738	42,934	-84.0	7,155	13,210
South Dakota	1,772,538	916,530	-48.3	112,639	140,929
Tennessee	455,022	109,673	-75.9	21,185	16,017
Texas	4,074,070	2,335,255	-42.7	553,329	734,350
Utah	227,481	101,751	-55.3	27,620	24,910
Vermont	2,884	2,257	-21.7	284	325
Virginia	75,508	29,602	-60.8	4,069	5,193
Washington	1,557,247	1,004,588	-35.5	95,414	218,700
West Virginia	7,885	5,115	-35.1	836	695
Wisconsin	713,022	193,668	-72.8	18,506	17,980
Wyoming	285,172	114,630	-59.8	33,180	43,194
Total	36,770,984	18,935,570	-48.5	3,050,522	4,093,179

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 http://nationalpheasantplan.org.