Do Resident and Non-resident Northern Bobwhite Hunters Self-Regulate their Harvest Based on Population Size?

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Additive vs Compensatory mortality

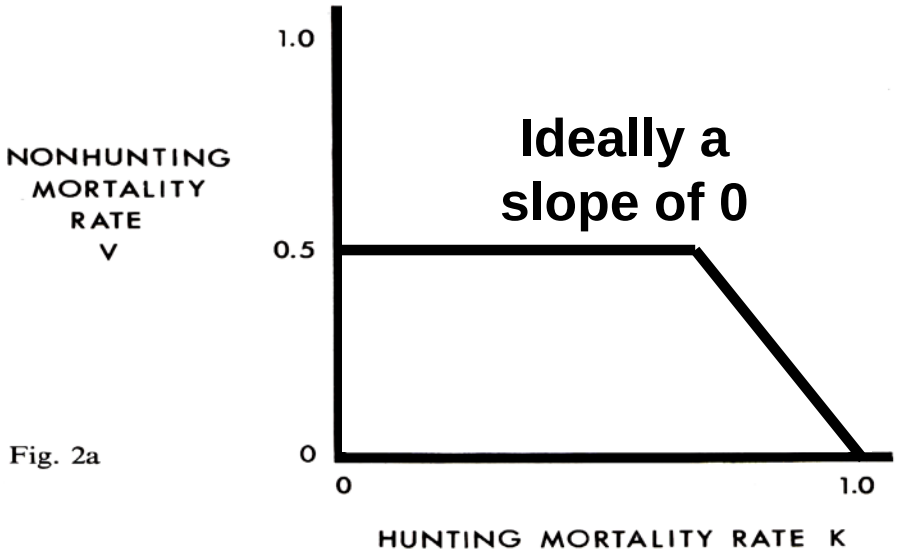


Fig. 2a

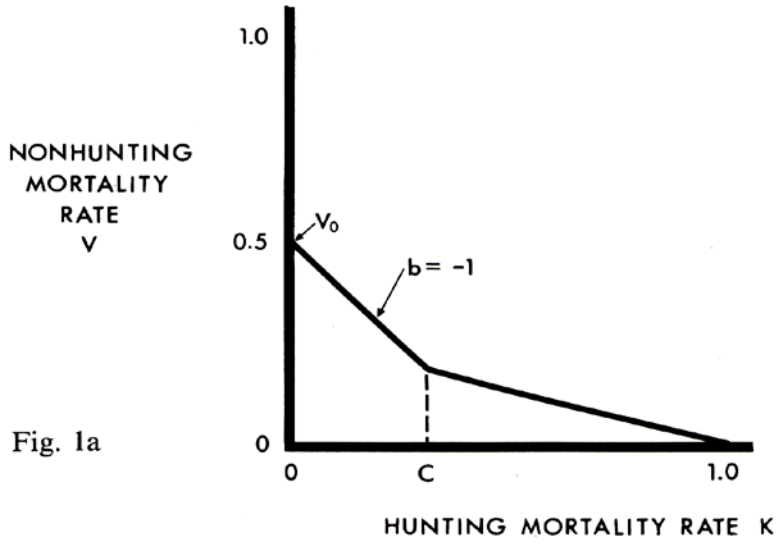
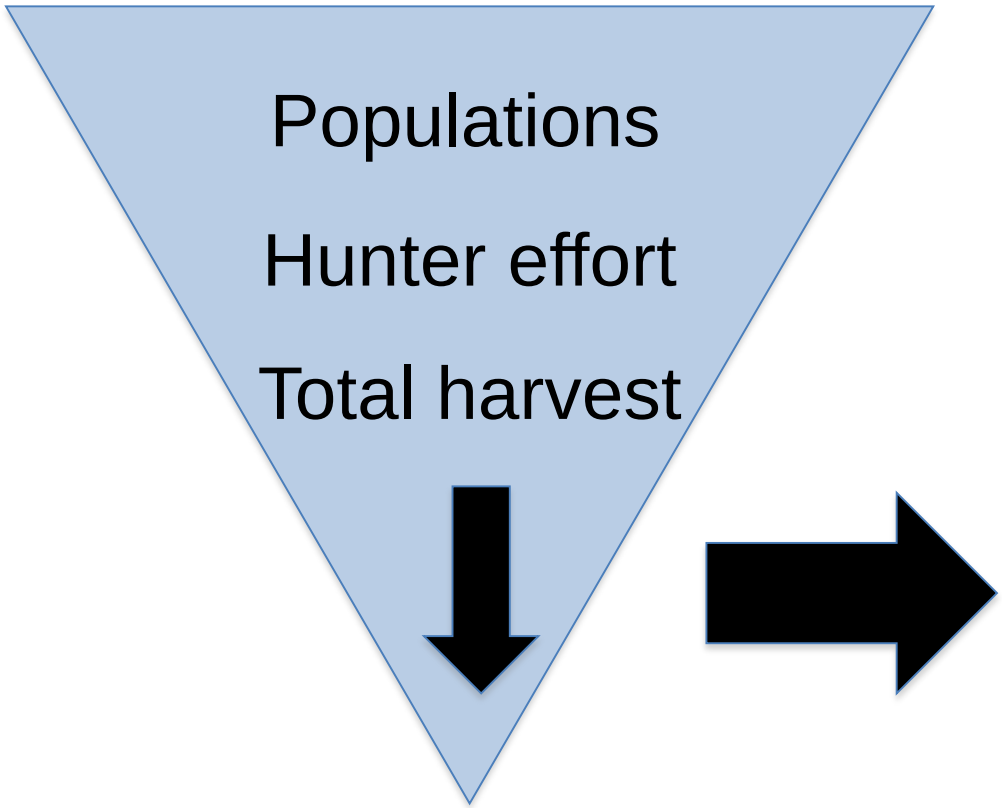


Fig. 1a

?

Habitat fragmentation
Predator requirements
Covey dynamics
Late season harvest

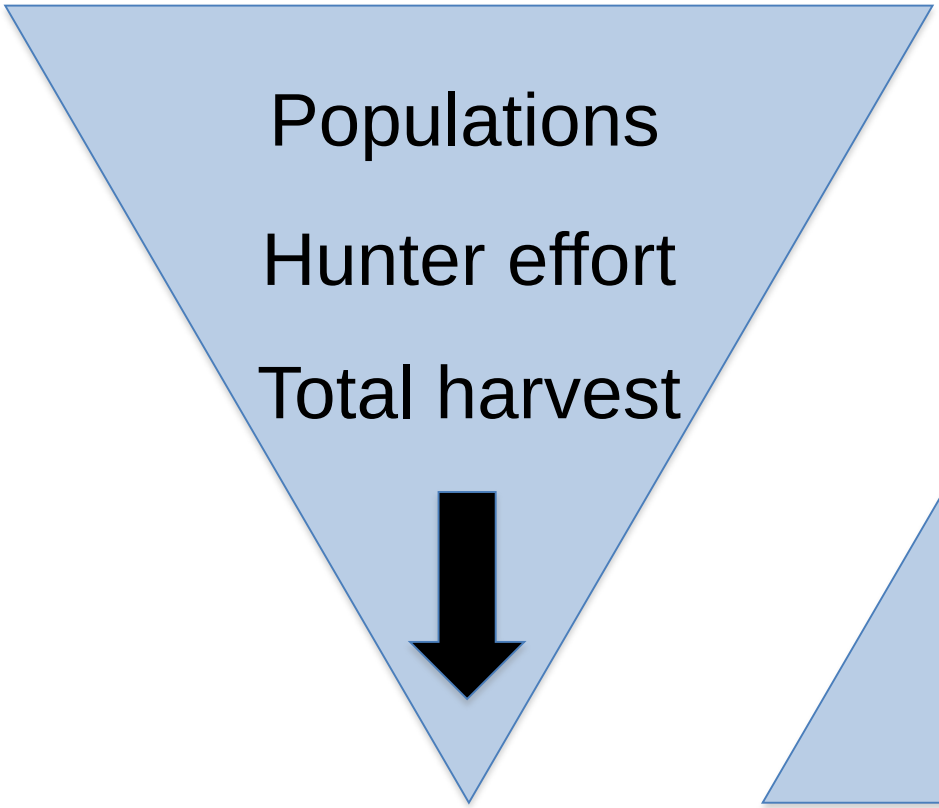
Adding social dynamics to the additive/ compensatory debate

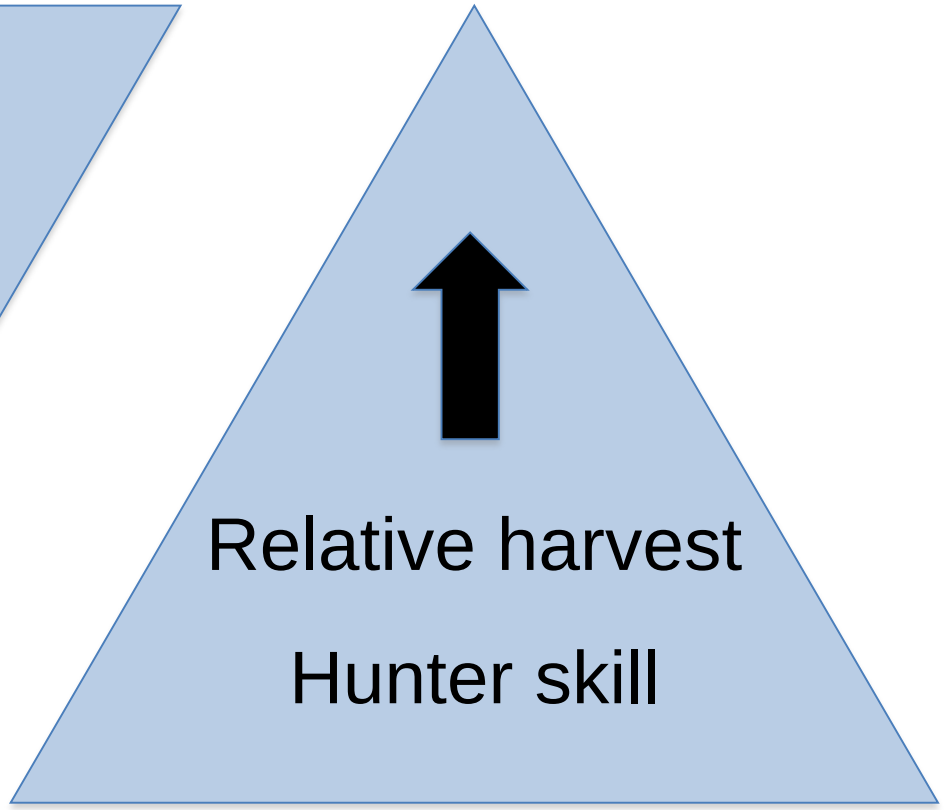


Self-regulation gives agencies justification to set seasons to a pre-determined standard opening date, bag limit, possession limit, and length

(Latham and Studholme 1952, Gallizioli 1965, Guthery 1986, Peterson and Perez 2000, Guthery et al. 2004).

However, Guthery et al. 2004 found in resident hunters across 6 states…





But do these relationships behave the same way for non-resident hunters?

Goals

Kansas is a popular destination for quail hunters with an estimated 20,000 non-resident hunters (out of a total 72,900 hunters) hunting the 2009–10 season. To better plan harvest management:

1. We examined 1966-1999 bobwhite populations and hunter surveys to test the hypothesis that as bobwhite populations decline, the number of hunters and harvest would decline.
2. We investigated if non-resident hunters follow the same self regulatory trend as resident hunters?

Methods: Population Surveys

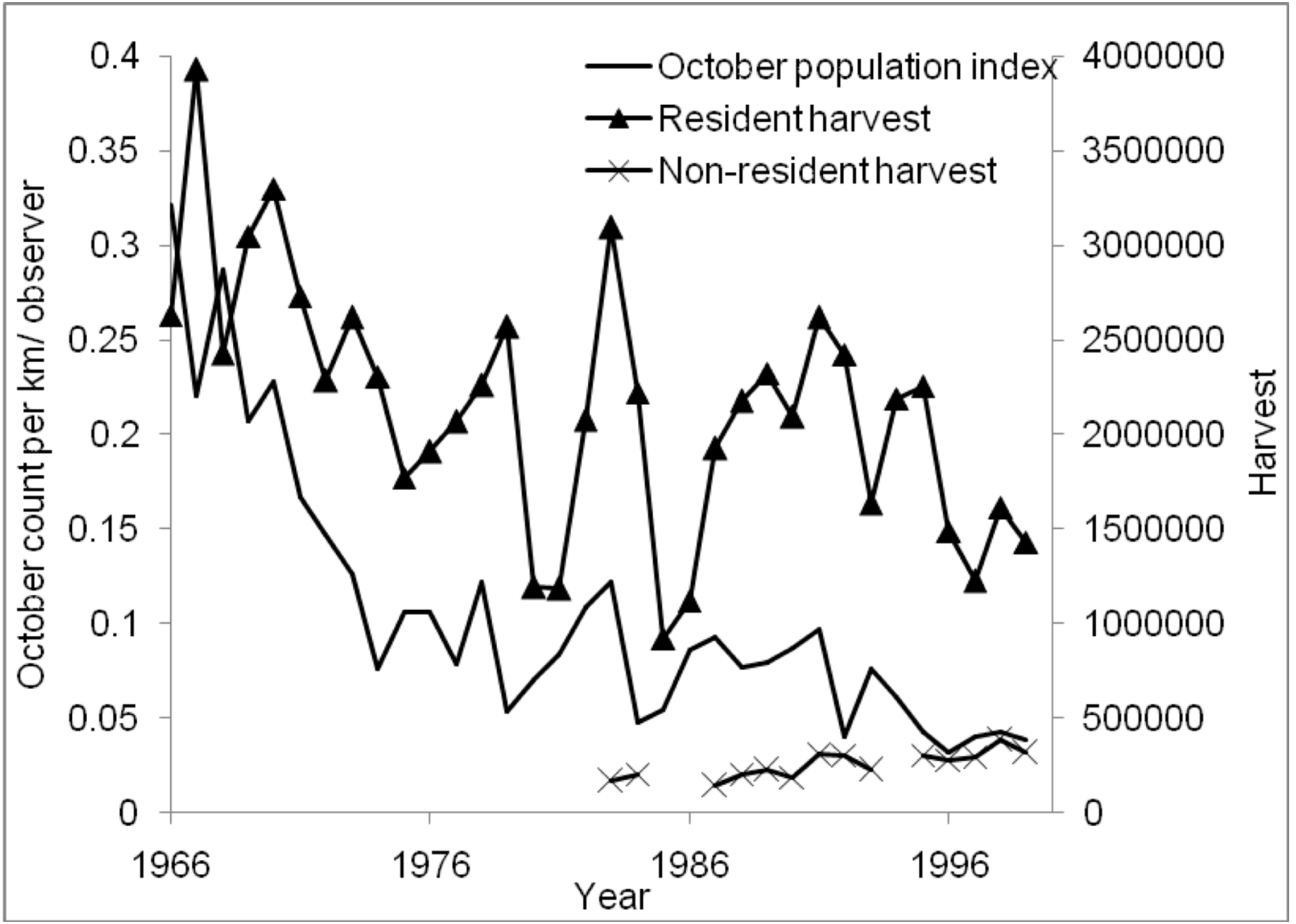
- Quail/km/observer were obtained from 550 annual roadside surveys conducted by rural mail carriers during the second week of October and January. Counts occur in every county and total 400,000 km.

Methods: Harvest Surveys

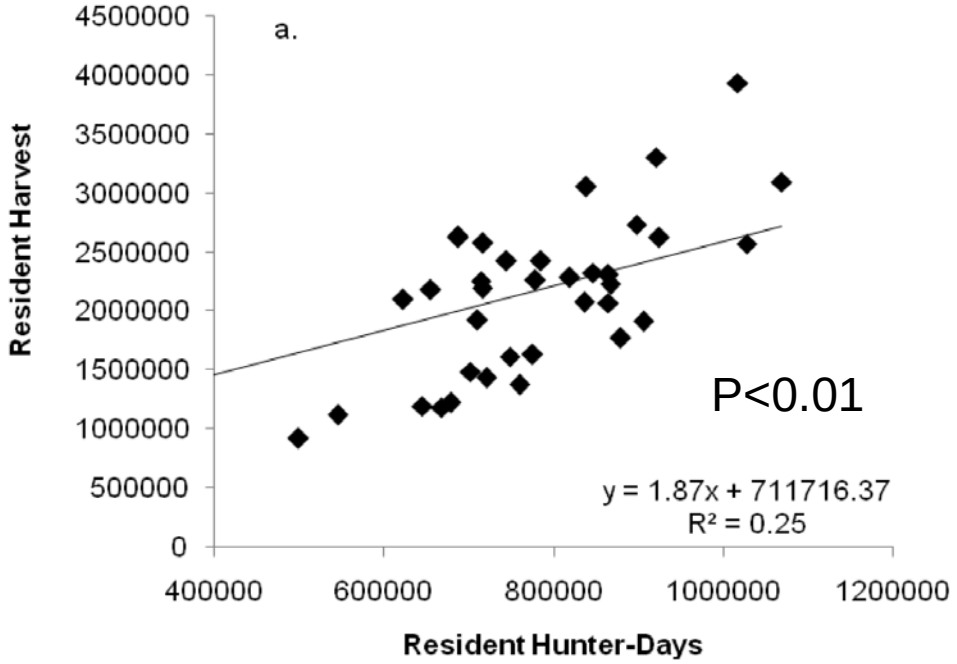
	Resident	Non-resident
Proportion	5-10% of previous years hunters	100%
Years	1966-1999	1982–83, 1986–92, 1994–1999
Average n/year	8,689 ± 1,867	974 ± 512
Response rate	27.8 ± 2.5%	45.0 ± 8.0%

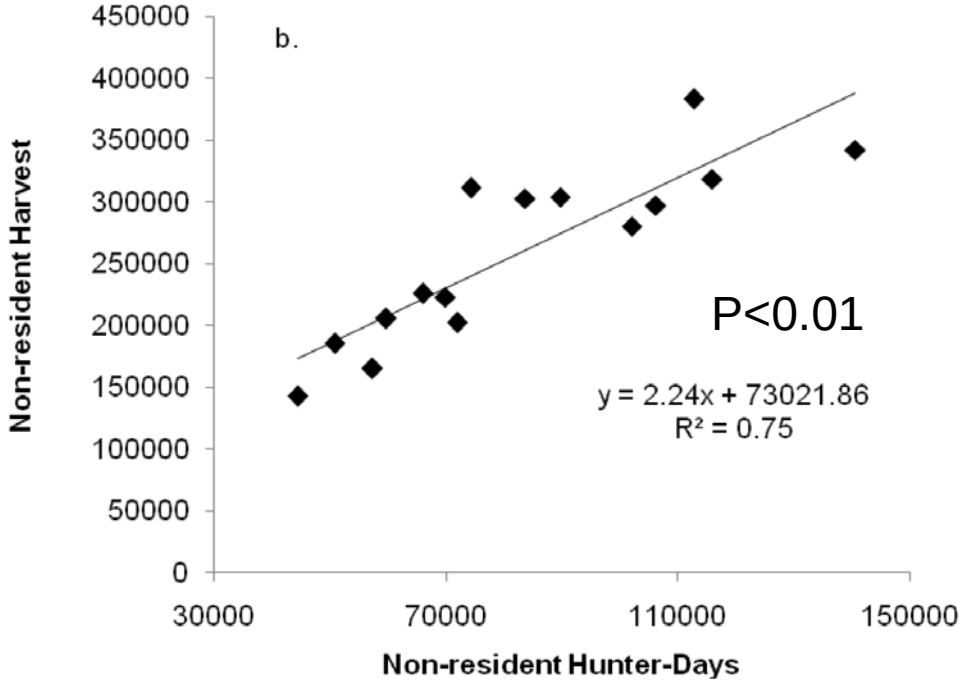
Further Estimates and Evaluation

- Relative pressure (P_R; pressure/index bird) = hunting days/ Oct index
- Hunter efficiency (S) = estimated harvest/hunter-day/index bird
- Relative harvest (R) = harvest/index bird
- Overwinter mortality (M) = 1 – Jan Index/Oct index
- We used simple linear regression ($P \leq 0.05$) to relate
  1. the number of resident and non-resident hunters to harvest
  2. the relationship between Oct population index and the number of resident and non-resident bobwhite hunters, harvest, and hunter efficiency
  3. the relationship between total relative harvest of both resident and non-resident hunters and estimated overwinter mortality

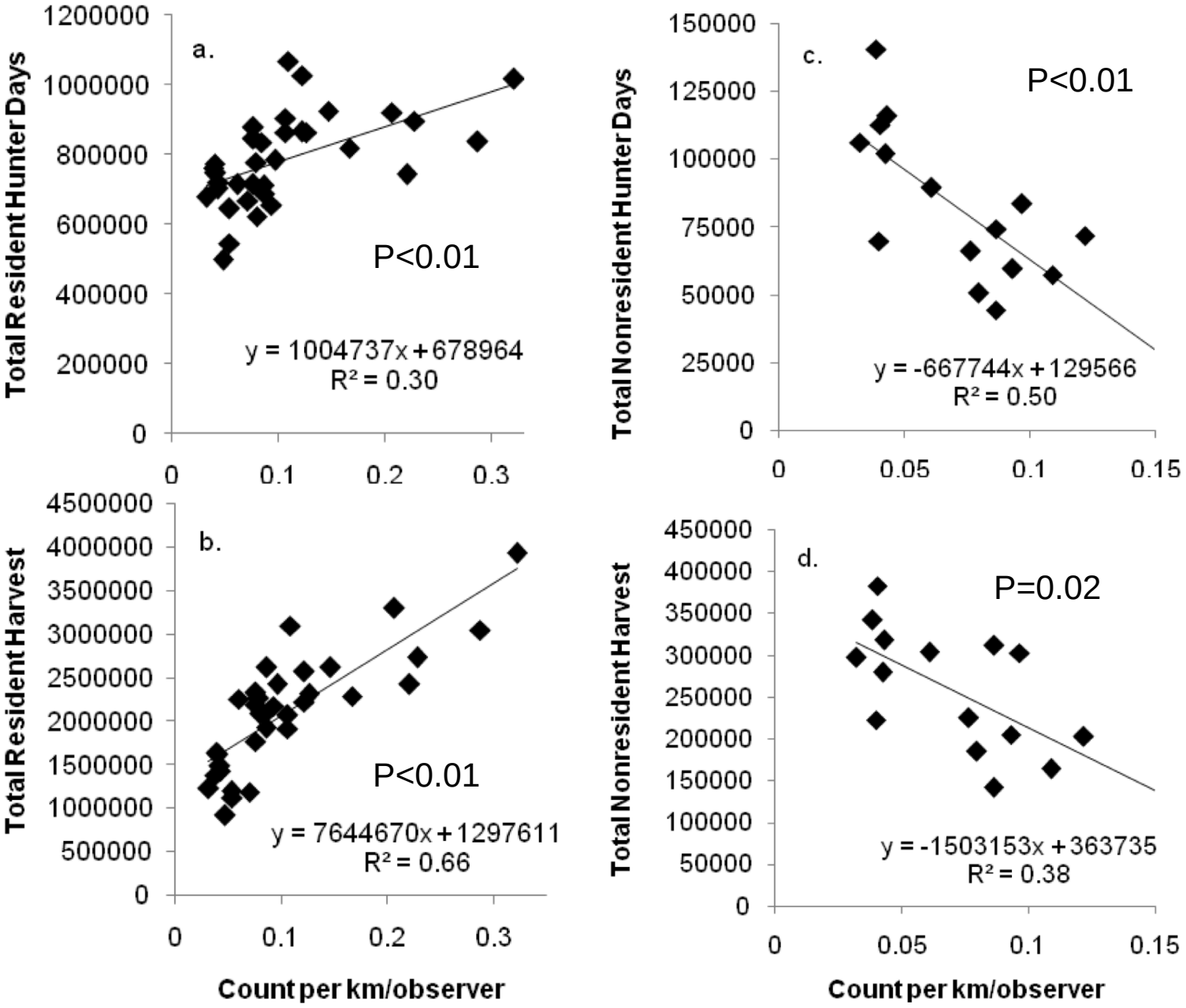

October population index
Resident harvest
Non-resident harvest
October count per km/ observer
Harvest
Year
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
4000000
3500000
3000000
2500000
2000000
1500000
1000000
500000
0
1966
1976
1986
1996

- The number of resident and non-resident hunters were related to resident and non-resident northern bobwhite harvest

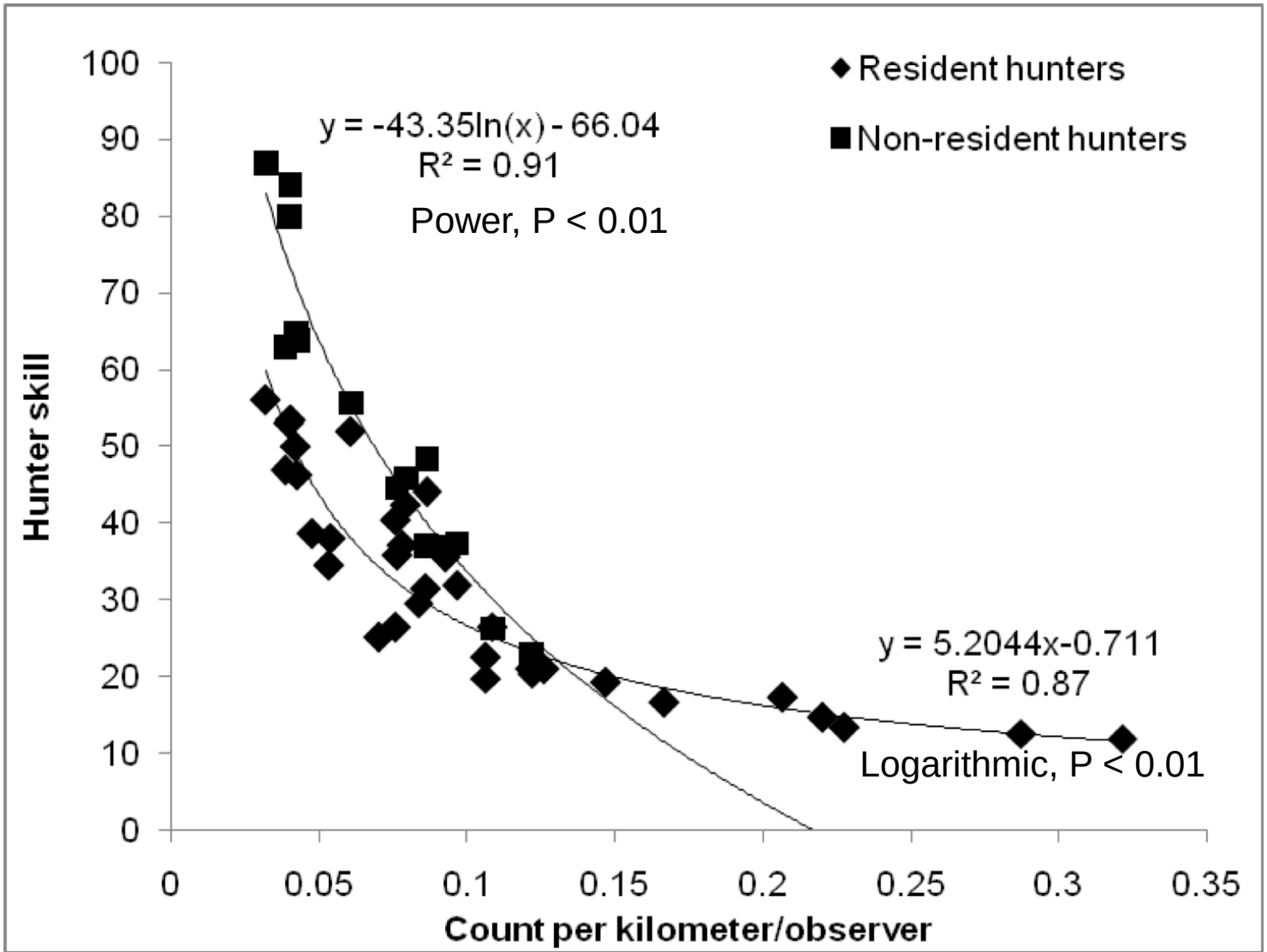




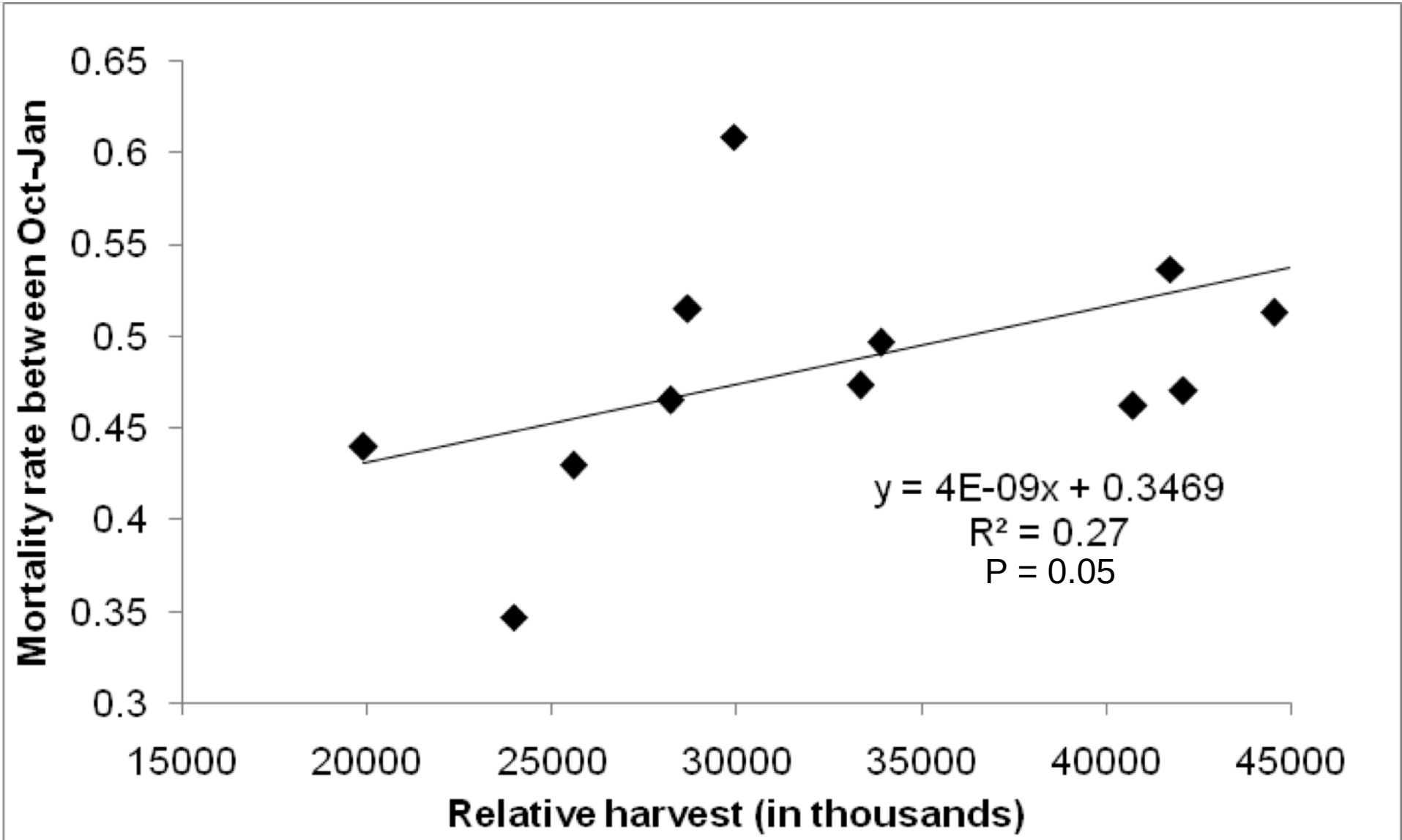
But note zero intercepts



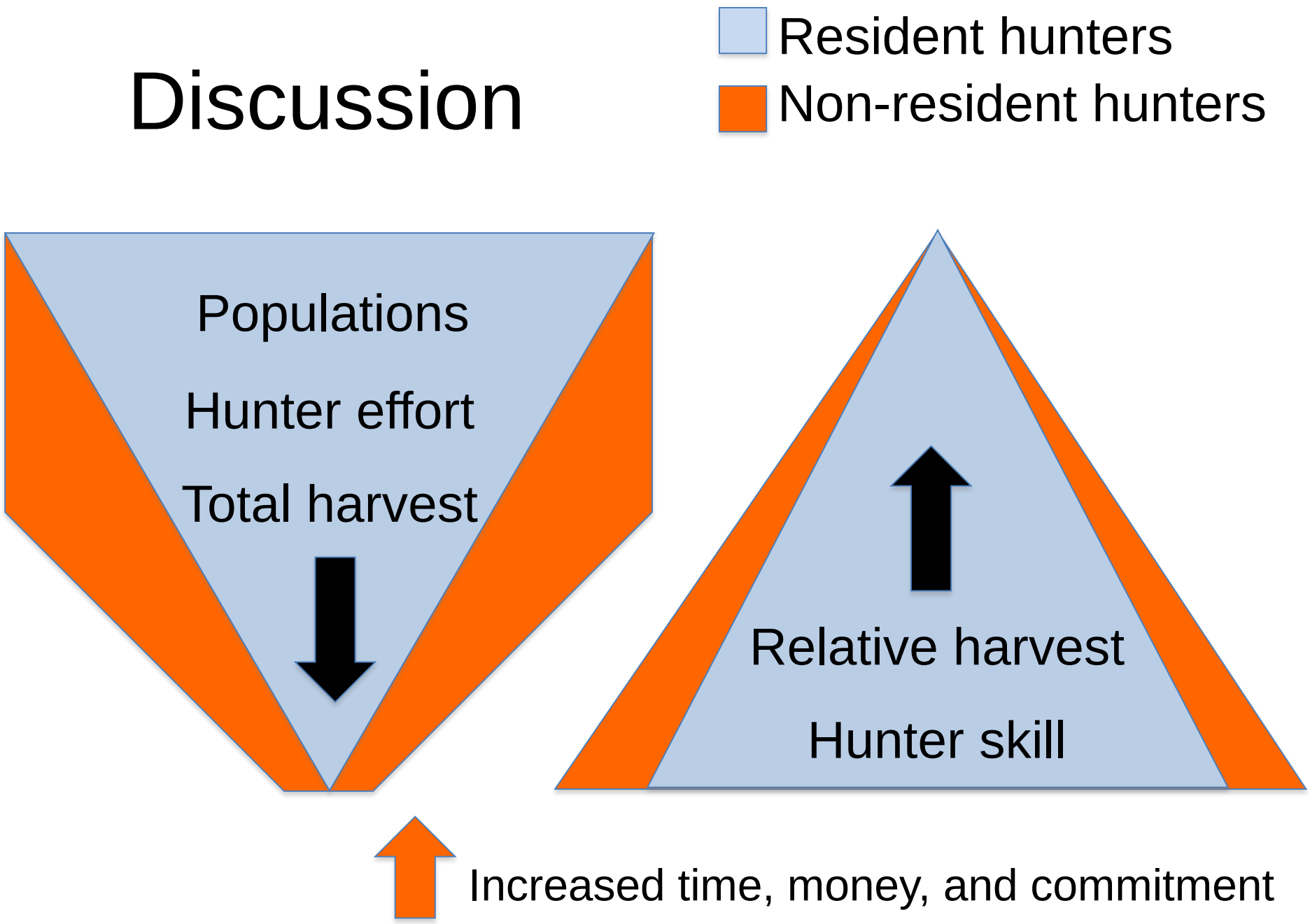
Hunter efficiency (harvest/hunter day/index bird) curvilinearly increased at lower quail abundance for all hunters but with higher magnitude for non-residents



During the 15 years of known total harvest, increased harvest rate (when populations were moderate to low) increased overwinter mortality indicating a more additive effect to harvest mortality



Discussion


Resident hunters
Non-resident hunters
Populations
Hunter effort
Total harvest
Relative harvest
Hunter skill
Increased time, money, and commitment

Discussion

- Many recommendations against late season harvest because of increased prey vulnerability and increased additivity of harvest. *Roseberry (1987), Curtis and Doerr (1989), Pollock et al. (1989), and Williams et al. (2004)*
- Informal surveys conducted on state wildlife management areas and private lands suggest that many non-resident hunters do not hunt during the opening of the season, as do residents. Therefore, non-resident hunting tends to peak in January when most of the harvestable surplus of bobwhites have been removed and hunter harvest becomes additive.

Management Implications

- We conclude that Kansas resident bobwhite harvest may be self-regulatory but non-resident harvest is not and harvest regulations should consider the increased additivity from non-resident hunters in future regulations.
- Policies associated with the concept of self-regulation continue to be promoted but we believe hunting of bobwhites should be regulated with care
    1. Managers should close the season to match neighboring states that provide high numbers of non-residents
    2. Consider Adaptive Harvest Management to be flexible in harvest strategies based on population size and resident/nonresident hunter participation

Acknowledgements

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- KDWP And Kansas State University personnel who coordinated the surveys, mailed surveys and entered data.