

KEEPING UP WITH Research

Factors Influencing the Adoption of Riparian Forest Buffers in the Tuttle Creek Reservoir Watershed of Kansas

Thad K. Rhodes, Kansas Forest Service; Francisco X. Aguilar, Department of Forestry, University of Missouri; Shibu Jose and Michael Gold, The Center for Agroforestry, University of Missouri

Introduction

The Tuttle Creek Reservoir watershed (*Figure 1*) has been identified as an area of high concern for water quality and quantity. Since reaching its conservation pool in 1963, the storage capacity of Tuttle Creek Reservoir has decreased by more than 40% as a result of sedimentation (KWA, 2010; KWO, 2012), and portions of the watershed are showing water quality impairments (KDHE, 2014). Permanent streamside vegetation consisting of a combination of trees, shrubs, and grasses, collectively known as riparian forest buffers, has the ability to alleviate problems associated with water quality and quantity and is especially beneficial for these purposes when located adjacent to agricultural fields. Despite existing research substantiating this importance, there is an apparent lack of interest from private landowners to adopt this practice on their property. This study attempts to provide insight into reasons for this disinterest by surveying landowners in the Kansas portion of the Tuttle Creek Reservoir watershed about preferences for streamside areas on their properties.

Methods

In the winter of 2014 (January 6 – March 3) a series of mailings were sent to Kansas landowners in the Tuttle Creek Reservoir watershed. Two different landowner types (non-adopter and adopter) were designated to receive a mailed survey asking about preferences for and against the presence of streamside trees on their property. Non-adopters were identified as landowners lacking adequate riparian vegetation at the time of the study as determined by a geospatial analysis; adopters included landowners who had voluntarily installed



Figure 1 Map of the Tuttle Creek Reservoir watershed in Kansas.

a riparian forest buffer on their property. Questionnaires consisted of 104 potential items, organized primarily in a Likert-type format (*Figure 2*) focusing on four main categories: landowner attitudes toward trees, economic motivation of landowners, landowner knowledge of riparian forest buffer benefits, and landowner perceptions of government-funded incentive programs.

Scale	Meaning	Scale	Meaning
1	Completely disagree	5	Somewhat agree
2	Disagree	6	Agree
3	Somewhat disagree	7	Completely agree
4	Neither agree nor disagree	8	Do not know

Figure 2 Likert scale classification used for the questionnaire.

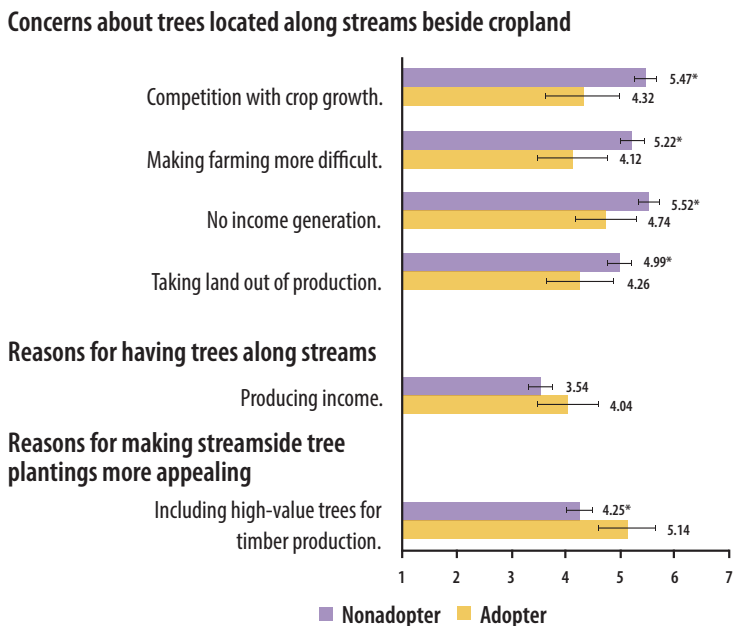


Figure 3 Landowner responses about economic aspects of tree plantings as measured by Likert scale (* indicates statistically significant difference).

Results

Landowners were fairly responsive to the questionnaire, with a participation rate of 70% and a final sample size of 200 non-adopters and 36 adopters. Responses indicated a wide variety of opinions, but several noteworthy trends began to emerge:

- » Riparian forest buffers need to be perceived as profitable (Figure 3). On average, landowners do not see commercial value in their existing woodlands, indicating opportunities for management activities that would increase the quality of this resource, as well as add to the recognition of its value. New plantings should include high financial value species with faster growing plant material, including larger and/or superior rootstock, and utilize a design that is not perceived to be competitive with adjacent crops.
- » Opportunities exist for education (Figures 4 and 5). There is a need to continue promoting the value of riparian forest buffers while simultaneously quantifying what is necessary for a buffer to be functional; often a single row of trees might not be sufficient. More than one-half of responding non-adopters indicate that they have not previously been exposed to the benefits of having trees located along streams, yet questions related to conservation ethic received some of the highest scores of the survey. This clearly demonstrates that landowners want to do the right thing, but in regard to riparian forest buffers they might not be aware of what that could, or should, be.

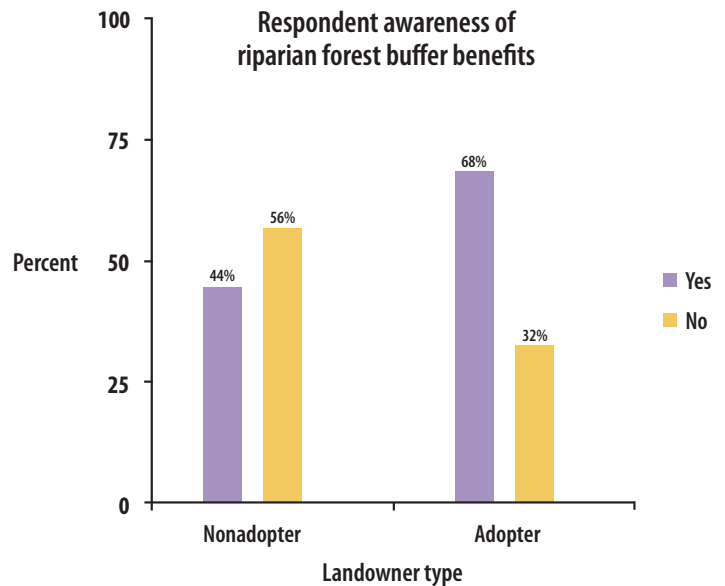


Figure 4 Landowner responses indicating previous exposure to the benefits of trees located along streams.

- » Provide landowners with necessary resources (Figure 6). Top ratings for increasing interest in riparian forest buffer establishment are financial and physical resources to help establish and maintain plantings. This is not too surprising as landowners who are full-time farmers would have limited time to dedicate toward a tree planting considering other aspects of the farming operations. While there are individuals who are willing to consider establishing riparian forest buffers on their property, these landowners need help to be able to do so successfully.
- » Create awareness of financial assistance programs (Figure 7). More than 70% of non-adopters are unaware of existing programs that could help assist with the costs of establishing riparian forest buffers. For those who are aware, concerns with regulations and low payments are most evident.

Implications

This study provides insight into landowner preferences for riparian forest buffers in the Tuttle Creek Reservoir watershed of Kansas and reveals that opportunities exist for more effective and efficient promotion of these practices. Because landowner interests will vary depending on location and situation, expanding survey efforts into other priority watersheds could identify similarities and differences in landowner preferences that could then be utilized for regional efforts to encourage the adoption of riparian forest buffers. By incorporating the desires of affected landowners, it is anticipated that future efforts for promotion and riparian policy development could lead to increased levels of adoption.

Reasons for having trees along streams

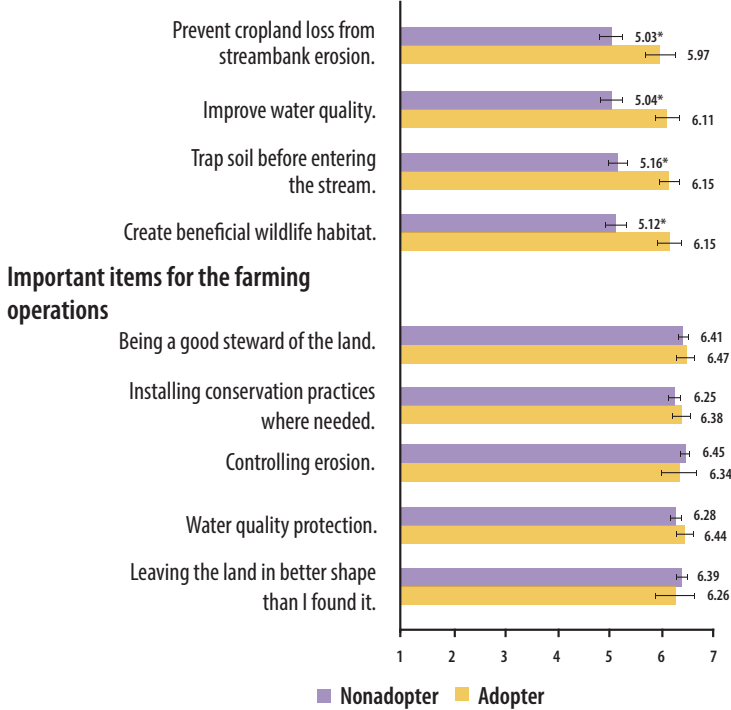


Figure 5 Landowner knowledge of riparian forest buffer benefits and reported conservation ethic as measured by Likert scale (* indicates statistically significant difference).

Factors making streamside tree plantings more desirable

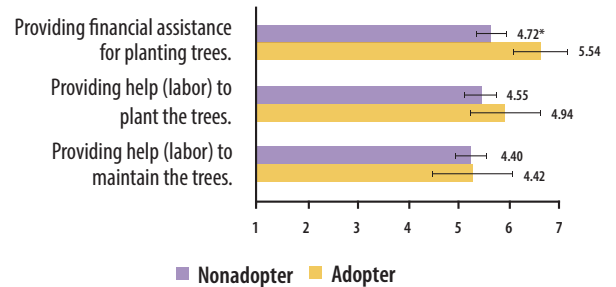


Figure 6 Landowner responses indicating characteristics that would increase interest in riparian forest buffers as measured by Likert scale (* indicates statistically significant difference).

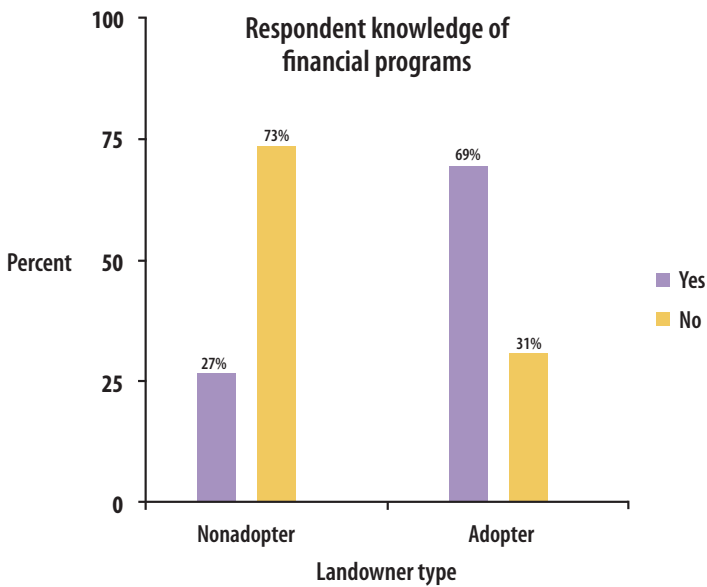


Figure 7 Landowner responses indicating familiarity with existing cost-share programs for streamside tree plantings.



Figure 8 A young riparian forest buffer.



Figure 9 Trees along a stream provide multiple benefits, including increased streambank stability.



Figure 10 Streambanks lacking permanent vegetation are more susceptible to erosion.

References

Kansas Department of Health and Environment (2014). 2014 303(d) list of all impaired/potentially impaired waters.
Kansas Water Authority (2010). Reservoir roadmap, volume III.
Kansas Water Office (2012). Tuttle Creek Lake, reservoir information sheet.

Acknowledgments

Thank you to the Kansas Forest Service and the Watershed Management Section of the Kansas Department of Health and Environment for funding this study (Grant #2013-3041), and for the support given by the Tuttle Creek Watershed Restoration and Protection Strategy (WRAPS) project.

The final publication is available at Springer via <http://dx.doi.org/10.1007/s10457-016-0045-6>

For more information, visit http://www.kansasforests.org/streamside_forestry/tcls/index.html or contact:
Thad Rhodes
Kansas Forest Service
trhodes@ksu.edu
785-776-7582 ext. 517

Copyright 2017 Kansas State University Agricultural Experiment Station and Cooperative Extension Service. Contents of this publication may be freely reproduced for educational purposes. All other rights reserved. In each case, give credit to the author(s), Keeping Up With Research, SRL 143, Kansas State University, March 2017. Contribution no. 12-057-D from the Kansas Agricultural Experiment Station.

Brand names appearing in this publication are for product identification purposes only. No endorsement is intended, nor is criticism implied of similar products not mentioned.

Publications from Kansas State University are available at: www.ksre.ksu.edu

Kansas State University Agricultural Experiment Station and Cooperative Extension Service

SRL 143 March 2017

K-State Research and Extension is an equal opportunity provider and employer.