CLOSUP Student Working Paper Series
Number 74

April 2021

A Close Examination of Recent Pollinator Policy

KT Meono, University of Michigan

This paper is available online at http://closup.umich.edu

Center for Local, State, and Urban Policy
Gerald R. Ford School of Public Policy
University of Michigan

A Close Examination of Recent Pollinator Policy

Abstract

Over the past 12 years, more research has been done on the importance of pollinators in our environment and lives. Therefore, governmental policies on a state level are of special consequence at this time. To investigate this, an inventory of state pollinator policies in the year 2020 was done through this paper. These policies were categorized based on both content and context. It was then discovered that among the 17 bills examined, there are several discernible trends. Within these policies, the size of the agricultural industry in a state does appear to affect the likelihood of that state having pollinator conservation policies; the larger the industry, the more likely it is. Finally, more state policies that were passed used the tactic of optional compliance rather than forced or required actions. This inventory, therefore, can act as guidance to future policymakers as it shows what patterns exist in current laws about pollinator conservation.

Introduction

Save the bees. This is the flagship phrase for a campaign that began 12 years ago (Badore, 2018). But why is this? Pollinators- bees included- hold an important role in ecosystem function when it comes to plants. And as we know, plants form an important base for both natural and human-centric food chains. But many people do not make the connection to know the impact that pollinating insects have on our food sources every day (USDA, n.d.a.). Insects like bumblebees, honey bees, butterflies, beetles, moths, and wasps are all part of the umbrella group of pollinating insects (Ostiguy, 2011). Each of these individuals can pollinate plants that go directly into our food system, even into our mouths. In fact, scientists at the United States

Department of Agriculture (n.d.b.) estimate that for every three bites of food we take, one of those was made possible by a pollinator. Therefore, it is imperative that we realize the importance of these insects and make the necessary moves to protect them.

But why do we need to protect them; who is hurting the bees? While bees and butterflies may not be losing their habitat as visibly as say the polar bears, they are still losing ground at an increasing rate. At the New York Bee Sanctuary (2015), they explain that the loss of habitat for nesting, wintering, and foraging due to human development can have an immense and deadly effect on the populations of bees. Another way we humans harm these important organisms is through our agricultural practices; the very thing we rely on them for, we hurt them with. Our use of pesticides and insecticides to protect crops from being harmed by insects can also harm the helpful ones. Loss of entire hives has been seen and linked to the use of these chemicals in farming (University of Massachusetts, 2021). And this loss of bees has then been shown to affect beekeeper profits, farmer yield, and so consumer prices (University of Massachusetts, 2021). So why has this problem not been addressed? Because there is a lack of governmental policy in place to protect these influential organisms. Research into existing policies and how they can inform new trends in laws must be done. And one specific avenue to look into when researching what policy is already in place is conservation through incentivized voluntary actions. This paper, therefore, aims to determine the extent that newly adopted pollinator conservation policies rely upon voluntary compliance.

Literature Review

Before any research can be done on this topic, one first needs to look into what others have done. There is a plethora of existing literature about pollinator policies that exist.

It is important to establish the importance of bees, butterflies, and other pollinating insects. Hall and Steiner worked to construct this background in their research article published in 2018. These researchers wrote about the overall decline of pollinating insect populations and the effect that this can have on diversity and food availability (Hall & Steiner, 2018). This scholarly article looks at the existing policy that protects pollinators. The method that the authors employed was a three-step process. The first step was conducting a series of searches into United States' policies using keywords. Then they did another search; this one, however, also included state names along with the keywords; they went state by state to ensure they had equal representation (Hall & Steiner, 2018). The final step was to directly contact the legislative librarian in each state for more policies. They found that the public is gaining more awareness and concern over the decline of pollinators. They also found that the current policies are a good start but leave room for improvement and that farmers will support policies that protect pollinating insects.

In addition to broad searches like that of Hall and Steiner, there was also more specific and narrow research done. Beryl-Vogt (2017) did policy research into the use of a particular insecticide that is harmful to pollinators in agriculture — neonicotinoids. She claimed that policy bans exist and are beneficial. She went about her research by searching scholarly databases. Beryl-Vogt (2017) used keywords words and phrases to narrow the search results to specific papers. After compiling the articles, an analysis was done on them for intent, severity, and success in their specific location. Over the course of this investigation it was learned that where farmers fall short in personally deciding to change their lands for the good of the environment, policy can fill this gap (Beryl-Vogt, 2017). In other words, legislation for pollinator protection works and is worth pursuing.

So what about looking at insect pollination on an individual scale? That is what researchers Hall and Steiner set out to do in a new article they wrote, this time in 2020. They wanted to evaluate the condition of conservation policy pertaining to pollinators in the United States. They did this through qualitative content analysis of state-level laws over 17 years (Hall & Steiner, 2020). Through this, they were able to discover overall trends in how this issue was framed in policy and the direction that new ideas are taking (Hall & Steiner, 2020).

But Hall did not stop his policy research there. Also in 2020, he published another research article; this time with Dino Martins. This piece of research, however, is a look into how humans view insects. Hall and Martins (2020) state that people all but completely overlook the importance of the insects that pollinate the Earth. The authors felt there was a sizable gap existing in research on this topic and so set out to fill this gap. In the article, they state there is a fair amount of scientific research into the effect of pollinator declines, but a severe lack of policy research (Hall & Martins, 2020). They decided to do this through other research articles of the past. They looked at what previous researchers declared needed to be done and then looked at current policy to see how many of those things had been addressed (Hall & Martins, 2020). Through this, they discovered that the way to get people to care about the decline of pollinating insects is by showing them the negative effect losing them will have on their own lives (Hall & Martins, 2020). That is, people only become invested when they realize it will negatively affect them if they do not.

Another set of authors who looked into the view that the public has for pollinating insects is Ratamäki et al. (2015). However, their research was on pollinator policy and opinion on both a local and much broader scale. They look at how people view pollinators and how that influences policy decisions and success. The method that they use is twofold; they conducted policy

research by keyword search and then analyzed the result (Ratamäki et al., 2015). The authors also collected interview data to use in their research as well. They were able to determine that the most effective way to have people care about a loss of pollinators- and therefore have legislation passed- is if they have felt the negative effects of losing these populations (Ratamäki et al., 2015). Only then do they believe people in small towns and across the globe will take action.

After looking at farmers and how they view pollinators as indirect but important parts of their livelihood, it is also worth looking at beekeepers whose entire livelihood hinges on pollinator survival. In their article, Maderson and Wynne-Jones (2016) look into the knowledge that beekeepers have and how that influences their willingness to support policies to protect pollinators. They looked into how much beekeepers know about the importance of and impact on diversity that bees have (Maderson & Wynne-Jones, 2016). They then also look at how beekeepers as a professional group have historically impacted policy implementations and changes. They carried out their research by doing interviews with a small group of people. Sixteen beekeepers were interviewed and observed by the researchers. Additionally, they analyzed the UK's archives on older beekeeping methods. In doing so they discovered that the popularity of beekeeping has increased in recent years (Maderson & Wynne-Jones, 2016). They also learned that beekeepers do actively engage in policy reform.

It is important to look at specific locations as well as the bigger picture. This is exactly what Narjes and Lippert (2016) did in their research article. They researched policy and farmers in northern Thailand. The authors state that this community group is especially vulnerable to the global decline of pollinators. Because of this, they wanted to determine the value that the farmers here, as a group, had for pollinators. And in turn, how they felt about policy reform to protect bees and other pollinating insects. The methods used to determine this were an economic

approach to policy analysis. They attempted to quantify the value of pollinators in a monetary amount and apply this to existing policies. Through this, they discerned which policies needed reform due to the economic value that farmers felt towards pollinators (Narjes & Lippert, 2016).

However, despite this existing research into these policies that exist to try and protect pollinators, there was a lack of those that looked at the in-depth state policies for the protection of these important animals. This is especially important as it pertains to more recent policies. Those policies that have been passed in 2020, will give a cardinal look into the tactics of lawmakers as they are more current than previous inventories had access to. Therefore, this paper seeks to identify patterns in recent state policies centered around pollinator conservation efforts. This inventory is not focused on a particular set of identifiers within the laws from 2020, but instead is an overall, yet simultaneously in-depth, review of the categorizations that the laws might be able to be grouped into. The goal of which is to see overarching trends in the bills.

Methods

In order to research this question, an inventory of policies across the United States needed to be compiled. This was done using the National Conference of State Legislatures (NCSL) database. It is important to note that the aim of this research is to create an inventory with a smaller range. While keyword search based inventories offer a broad scope with which to look at policies, a narrower search will allow a deeper look into pollinator conservation in the U.S.

The initial search had the parameters of only bills on the topic of pollinators, in all 50 states, and limited to the year 2020; this yielded a result of 156 bills. However, the goal of this paper is to take a more intimate look at the policies in effect. Therefore, the search was narrowed

by limiting it to only those bills that were either adopted or enacted. This then resulted in a total of 17 bills (3 adopted and 14 enacted). This is a more manageable number and is conducive to doing an in-depth review and analysis of each article individually. Therefore, by thoroughly looking at each bill, a more all-encompassing inventory can be done.

The analysis of these search results was done in two main ways. The first was looking at each policy with set variables in mind. The goal of this was to categorize each bill into how it attempts to aid conservation for pollinating insects. First, the articles were distinguished based on required or optional action. After this first step was completed, the bills were also analyzed based on whether they targeted public groups and organizations, or private ones.

In the case of the required actions vs optional actions, the goal is to see if the bills mandate a behavior. 4 different labels were applicable to the bills; these are optional, required, mixed, and N/A (or non-applicable). Those laws designated as mixed were due to their complex nature; because they had aspects of both required and optional actions involved in the wording of the law. This combination meant that a new category needed to be made. The notation of N/A was given to that law which dealt directly with a budget issue in legislation and therefore did not fit into any of the other classifications.

The second content-based variable, however, is that of the targets of the law itself. The goal of this analysis was to determine if there is a specific type of group or people that that bill is aimed at. For groups to be considered public, they would fall into the category of being not-for-profit like a government entity. And in contrast, those that would be considered private are for-profit, an example being a beekeeper's business. These content variables- for all 17 bills examined in this paper- are shown in Appendix A.

The second set of variables used in analyzing the laws are contextual variables. These include the geographic location of each bill relative to the others, the size of the agriculture industry in that state, and the historic political affiliation of each state. In more specific terms, the location of each bill will be done based on which state it was passed in. From this, the size of the agricultural industry in each state was determined in two ways; the first method is through a ranking system of numbering each state in order of most payment for commodities received in one year; this data was collected by the United States Department of Agriculture (USDA, 2020a). The second indicator for agricultural proficiency in a state was the number of farms present there. This data was also from the USDA; it is a summary of the farms and land use for farms (USDA, 2020b).

In addition to the agricultural size of a state, the political party affiliation of it is also an important variable to examine. The political alignment of the legislations was decided by which political party had control over the legislation and the governorship in that state. If both were not controlled by the same party, then it was labeled a "split" state. The data for political affiliation determining each of these variables, every law that is an output of the search - all 17 - have been categorized and labeled. The goal of this set of variables was to identify trends in any particular state or region throughout the country. These contextual variables are shown in Appendix B.

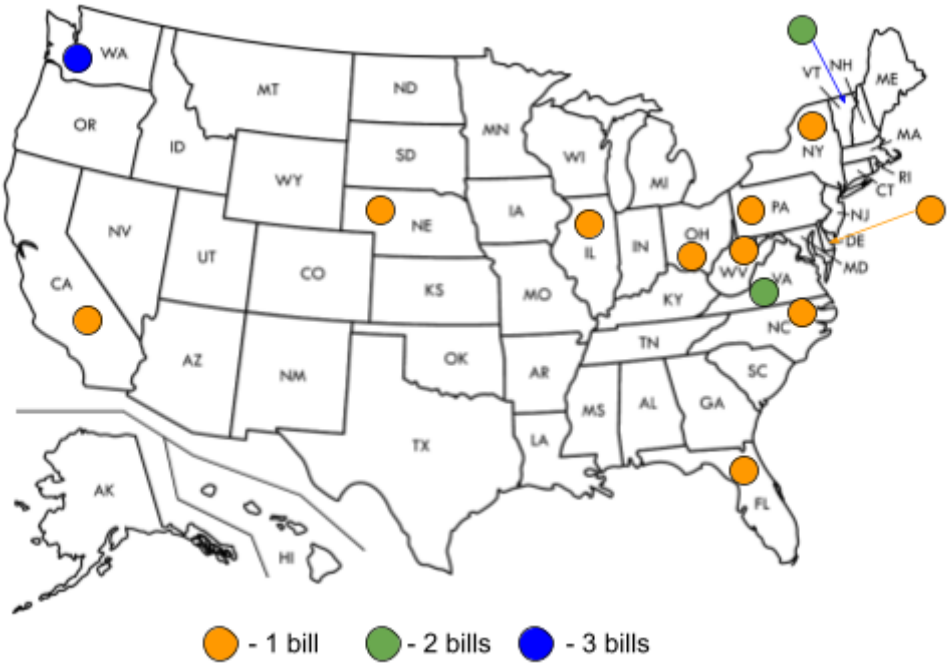
Results

Of the 17 bills examined, they were from a total of 13 states all ranging from the East to West Coast of the United States. However, there does appear to be a greater presence of laws for protecting pollinators in the North-East of the continental U.S. Of the 13 total states, only three had multiple bills enacted or adopted; the two states with two bills each are Vermont and Virginia

and one state- Washington- had three bills on pollinator conservation in 2020. Figure A, below, illustrates the distribution and amount of laws present in states across the country.

Figure A

Map of the United States Showing the Distribution of Bills by State

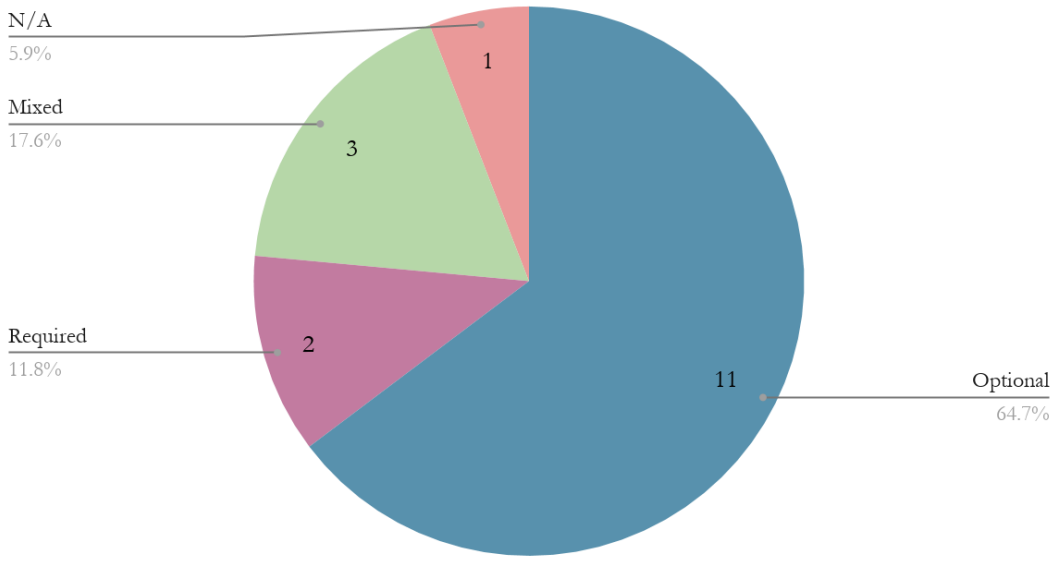


Required vs. Optional

After analyzing and cataloging each of the 17 bills, stock is then able to be taken of the resulting numbers. These observations are that 11 of the 17 laws were labeled as optional; 2 as required; 3 as mixed; and 1 as N/A. Figure B is a visual illustration of the distribution of bills into each of these categories.

Figure B

Results of Categorizing Bills (Content-Based)



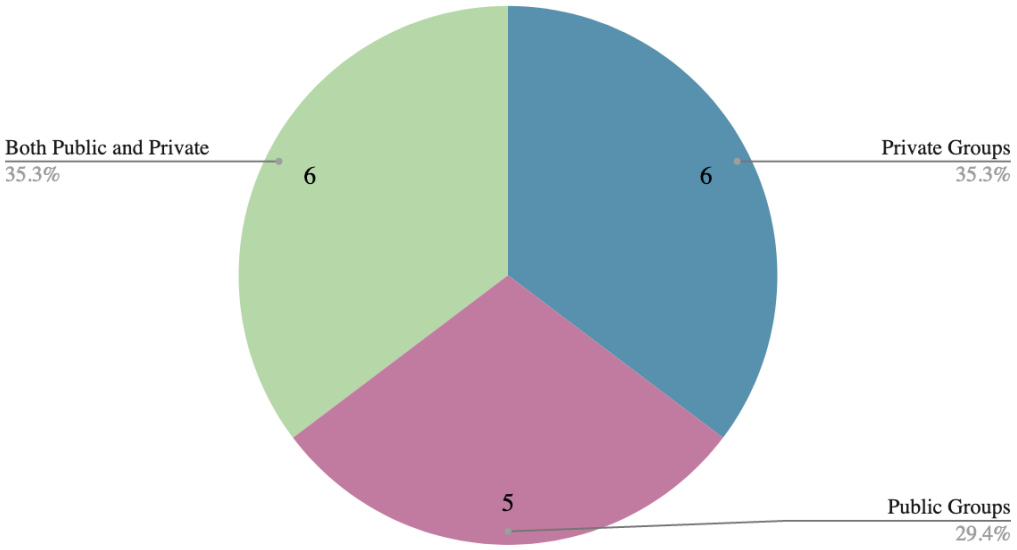
Interestingly while reviewing the topics that appear in the legislation, another trend became apparent. It was found that 4 of the legislation examined in this study, were for the designation of time frames as certain recognized holidays. These timeframes range from one singular day to an entire month. One example of this is the state of West Virginia where they designated a day to be "Honeybee and Beekeeper's Day." Another example is Ohio; which declared an "Ohio Native Plant Month" with the language of the bill directly referencing pollinating insects. For the 4 bills with topics of this kind represented, they were categorized as being "optional." This is due to there being no mandatory action by any party to recognize or partake in the state-wide holiday. After examining these pieces of legislation, it is revealed that ordinances for dedicating dates for pollinators are a frequent occurrence.

Public vs. Private

Another important distinction to make is what laws are directed towards governmental bodies, and- in contrast- which are written for private parties. Of the 17 bills, 6 are considered to affect private organizations or groups. From the remaining legislation, 5 can be labeled as having the greatest effect on public entities like governmental bodies or subgroups. Finally, the last 6 active laws from 2020, appear to have a significant effect on both groups. This divide in the targets of the policies is shown in Figure C.

Figure C

Results of Categorizing Bills (Contextual Based)



When looking specifically at those bills that are directed at the public, there appears to only be one common theme and that is registration. Some laws require the registration of beehive locations like Vermont— although, importantly, only those man-made or man-tended. And in continuing, if there is any intent to move one of these hives, there is a requirement for disclosing that to the state like in the case of California. Another example of registration that occurred in

several bills was a farmer's use of pesticides or insecticides. However, people are only required to inform the government if the pesticide or insecticide has been documented to harm the health and well-being of pollinating insects.

Now when looking only at those laws that were made to change government actions, two major themes that can be seen. A common idea is that of re-distributing the state's budget. The second being how state agencies like the state's Department of Agriculture must prioritize pollinators when redesigning or managing government lands.

Analysis

By examining the characteristics of the states, several trends can be seen. The first of these being that of the 13 states with bills examined in this study, 4 of them are among the top 10 agriculture producing states in the U.S.: California, Nebraska, Illinois, and North Carolina. In other words, 30% of the pollinator-based policies were in the top 20% of states for agriculture in 2019. This is very telling that the importance of agriculture to a state can be a leading influencer in their decision to value and protect pollinating insects through laws. Similarly, in 2019, the overlap between states with pollinator conservation laws being ratified and those with the highest number of farms is 2; this is with the repetition of California but the addition of Ohio. Table 1, below, shows the ranking of the states that both had pollinator bills in 2020 and were among the top 10 agricultural industries in the United States for the same year.

Table 1

States ranking of Agricultural Variable Size for 2020
(only those that were in top 10 and passed pollinator conservation bills shows)

State	Ranking for Agricultural Industry (Nationally)*	Ranking for Highest Number of Farm (Nationally)**
California	1	6
Illinois	6	-
Nebraska	3	-
North Carolina	9	-
Ohio	-	7

*Data from the United States Department of Agriculture state ranking based on cash receipts by commodity for 2019. https://data.ers.usda.gov/reports.aspx?ID=17844
**Data from United States Department of Agriculture "Farms and Land in Farms 2019 Summary," https://www.nass.usda.gov/Publications/Todays_Reports/reports/fnlo0220.pdf

Another result of examining this collection of bills is the political leanings in each state. After looking at the data for politics by state in 2020 by NCSL, there is no clear trend. Only six of the 13 states had clear Democratic affiliation. In contrast, just three of the states were Republican-led. And finally, the last four states were divided in their associations. This is again a telling piece of information that shows that the political ideology of the legislation of a state and its constituents can have little impact on the kind of laws that are proposed and supported there. Here it can be seen that what political party is most dominant in a state does not have a

significant influence on that state's laws when looking at the context of pollinator conservation. More states with Democratically oriented government had laws enacted or adopted in 2020 than those of Republican orientation. However, the difference in the numbers is minute. After the examination, it became clear that there was no direct trend in the states with one dominant political party over another. This, therefore, dispels the notion that political association within a state's legislature would somehow influence the presence of pollinator conservation laws there.

These results do share some similarities with the literature review done before. One example of this is Maderson and Wynne-Jones' article from 2016 who stated that beekeeping, as a profession, has become more popular recently. This is something that is reflected in the laws examined here. States such as Vermont and Washington have policies that require the reporting of hive numbers and locations because there are more hives than years before. Another example of a connection to the previous literature on this subject is the use of pesticides. In 2017 Beryl-Vogt wrote her policy research on pesticides and insecticides that are known to be harmful to pollinators- specifically neonicotinoids- being banned. In the research for this inventory, it was discovered that states like Vermont require the registration of neonicotinoid use because there is a fine by the state for it.

Conclusion

While the results of this inventory are important, it is necessary to recognize the limitations of this paper. For example, this examination was done on a very small scale. Although the narrow scope was on purpose- to allow a more in-depth review of each bill, this did mean the overall size of the inventory was only 17 policies. This meant that once the laws were split into their categorizations, there were mere single digits of numbers to compare. Therefore,

when attempting to draw conclusions from this data it is difficult as there is no immense numerical difference between groups. Another restriction to be aware of for this data is the limited time frame. This paper only examined bills from 2020. While this in and of itself is a small amount of time, it is also important to note that this year was the beginning of the Covid-19 pandemic. It is very likely that this situation- which entailed numerous stay-at-home orders and therefore halted many normal processes- could have affected the number of laws brought to and ultimately reviewed by state legislations.

However, despite the constraints, there is much to be learned from this resulting data. In analyzing the data it is clear that while many things can have an impact on the proposal, passage, and use of a policy to protect pollinating insects in a state, political affiliation is not one of them. The association of those people in power with a political party did not appear to alter the use of bills to help conserve pollinators. Despite this, there were clear trends. It was apparent that there was a strong overlap in states with high agricultural industries and those with bills to protect pollinators. Additionally, among those policies that were adopted or enacted in 2020, most did not require compliance from constituents but instead sought voluntary participation.

This information can be extremely insightful for when lawmakers write and propose policies for pollinator conservation in the future. This is because policymakers often need to draw on existing legislation. What this paper provides these individuals is a reference for existing legislation. For example, they can use the knowledge that agricultural industry size does impact which states have these kinds of laws to selectively choose which states to attempt law reform in to affect the fastest change. In contrast, however, they might also use the data presented here to know where policy research is lacking. An example of this is that the vast majority of laws from 2020 were on the eastern side of the U.S. They may, therefore, wish to

target the other half of the country as a way of spreading policy to where it is absent for a greater impact. Therefore, the applications of this research for future laws are simply limited by whom chooses to use it.

Appendix A

Table of all 17 bills- organized alphabetically- based on content variables

Code	Topic	Public vs Private*	Required / Optional**
2019 CA A 450 (link)	Changes existing law about registering movement of a kept beehive	Private	Optional
2019 DE H 195 (link)	The DoA must appoint a State Apiarist to inspect, educate, etc.	Public	Optional
2020 FL H 1135 (link)	Redistributes funding to the Florida State Beekeepers Association for research, outreach, etc.	Public	N/A
2019 IL H 3092 (link)	Mandates state agencies to prioritize pollinators when using prairies	Public	Required
2019 NC S 606 (link)	Prioritizes native plant use around highways	Public	Optional
2019 NE L 320 (link)	Requires registering pesticide use when it will negatively affect pollinators	Private	Optional
2019 NY S 2044 (link)	Information shall be provided by the DoA to help people with attaining a recommended minimum pollinator vegetation amount	Both	Mixed
2019 OH H 59 (link)	Designates the April as "Ohio Native Plant Month"	Both	Optional
2019 PA HR 385 (link)	Designates the week of June 17th as "Pollinator Week"	Both	Optional
2020 VA HJR 140 (link)	Designates February as "Winter Honey Month"	Both	Optional
2020 VA H 1237 (link)	Changes to an existing law that allows beekeepers to apply to receive beehives from the state	Both	Optional
2019 VT H 205 (link)	Requires the registration of the use of neonicotinoid pesticides and a fine accompanied with using them	Private	Optional
2019 VT H 656 (link)	Mandatory registration of kept hives and documentation of any diseases	Private	Required
2019 WA H 1133 (link)	Protects beekeepers from liability for damage caused by beekeeping act or machinery	Private	Optional
2019 WA S 5552 (link)	New ordinances for government land and budget changes for supporting pollinator protection efforts	Public	Mixed
2019 WA S 6168 (link)	Allocates a portion of the annual budget to substitute Senate bill No. 5552 [establishes a pollinator health task force and makes necessary considering pollinators when managing government lands]	Private	Mixed
2020 WV SR 57 (link)	Designates February 28 as "Honeybee and Beekeeper's Day"	Both	Optional

*Both refers to both public and private groups being affected by the law
**Mixed refers to aspects of both optional and required actions being present in the law

Appendix B

Table of all 17 bills- organized alphabetically- based on contextual variables

Code	State	Ranking of State's Agricultural Industry*	Ranking of States by Number of Farms**	Political Affiliation of the State***
2019 CA A 450 (link)	California	1 (49,938,076)	8 (69,900 farms)	Democrat
2019 DE H 195 (link)	Delaware	39 (1,253,987)	48 (2,300 farms)	Democrat
2020 FL H 1135 (link)	Florida	18 (7,796,019)	15 (47,400 farms)	Republican
2019 IL H 3092 (link)	Illinois	6 (16,318,156)	7 (71,400 farms)	Democrat
2019 NE L 320 (link)	Nebraska	3 (21,436,242)	18 (45,700 farms)	N/A
2019 NY S 2044 (link)	New York	25 (5,317,729)	27 (33,400 farms)	Democrat
2019 NC S 606 (link)	North Carolina	9 (10,603,108)	17 (46,200 farms)	Divided (R legislation and D governor)
2019 OH H 59 (link)	Ohio	14 (8,519,770)	4 (77,800 farms)	Republican
2019 PA HR 385 (link)	Pennsylvania	23 (6,675,212)	14 (52,700 farms)	Divided (R legislation and D governor)
2019 VT H 205 (link), 2019 VT H 656 (link)	Vermont	41 (792,174)	44 (6,800 farms)	Divided (D legislation and R governor)
2020 VA H 1237 (link) 2020 VA HJR 140 (link)	Virginia	32 (3,362,950)	19 (42,400 Farms)	Democrat
2019 WA H 1133 (link), 2019 WA S 5552 (link), 2019 WA S 6168 (link)	Washington	12 (9,302,294)	25 (35,600 farms)	Democrat
2020 WV SR 57 (link)	West Virginia	44 (638,752)	35 (22,900 farms)	Republican

*Data from the United States Department of Agriculture state ranking based on cash receipts by commodity for 2019. https://data.ers.usda.gov/reports.aspx?ID=17844

**Data from United States Department of Agriculture "Farms and Land in Farms 2019 Summary," https://www.nass.usda.gov/Publications/Todays_Reports/reports/fnlo0220.pdf

***Affiliation is determined by the political party control of the state legislation and governorship. R refers to Republican. D refers to Democrat. Data from NCSL "State Partisan Composition," for 2020. https://www.ncsl.org/research/about-state-legislatures/partisan-composition.aspx#

Citations

Badore, M. (n.d.). Bees in peril: A timeline. Retrieved February 27, 2021, from https://www.treehugger.com/bees-peril-timeline-4857054

Beryl-Vogt, M. (2017). Toward functional pollinator abundance and diversity: Comparing policy response for neonicotinoid use to demonstrate a need for cautious and well-planned policy, *Biological Conservation*, 215, https://doi.org/10.1016/j.biocon.2017.09.006.

Hall, D., & Martins, D. (2020). Human dimensions of insect pollinator conservation. *Current Opinion in Insect Science*, 38, https://doi.org/10.1016/j.cois.2020.04.001

Hall, D., & Steiner, R. (2018). Insect pollinator conservation policy innovations at subnational levels: Lessons for lawmakers. *Environmental Science & Policy*, 93, https://doi.org/10.1016/j.envsci.2018.12.026

Hall, D., & Steiner, R. (2020). Policy content analysis: Qualitative method for analyzing sub-national insect pollinator legislation. *MethodsX*, 7, https://doi.org/10.1016/j.mex.2020.100787

Maderson, S. & Wynne-Jones, S. (2016). Beekeepers' knowledge and participation in pollinator conservation policy, *Journal of Rural Studies*, 45, https://doi.org/10.1016/j.jrurstud.2016.02.015.

Narjes, M. & Lippert, C. (2016). Longan fruit farmers' demand for policies aimed at conserving native pollinating bees in Northern Thailand, *Ecosystem Services*, 18, https://doi.org/10.1016/j.ecoser.2015.10.010.

NCSL (2021a). Environment and Natural Resources State Bill Tracking Database. Retrieved February 10, 2021, from https://www.ncsl.org/research/environment-and-natural-resources/environment-and-natural-resources-state-bill-tracking-database.aspx

NCSL (2021b).“State Partisan Composition for 2020.” Retrieved March 13, 2021, fromhttps://www.ncsl.org/research/about-state-legislatures/partisan-composition.aspx#

New York Bee Sanctuary (2015). Habitat loss. Retrieved February 27, 2021, from http://www.newyorkbeesanctuary.org/habitat-loss

Ostiguy, N. (2011). Pests and Pollinators. Retrieved February 27, 2021, from https://www.nature.com/scitable/knowledge/library/pests-and-pollinators-23564436/

Ratamäki, O., Pekka. Jokinen, P., Sorensen, P., Breeze, T., & Potts, S. (2015). A multilevel analysis on pollination-related policies, *Ecosystem Services*, 14, https://doi.org/10.1016/j.ecoser.2015.01.002.

University of Massachusetts Amherst. (2017). Toxicity of pesticides to pollinators and beneficials. Retrieved February 27, 2021, from https://ag.umass.edu/fruit/ne-small-fruit-management-guide/appendices-resource-material-listings-conversion-tables-0

USDA. (n.d.a.). Natural resources Conservation Service. Retrieved February 27, 2021, from https://www.nrcs.usda.gov/wps/portal/nrcs/detail/pa/plantsanimals/?cid=nrcs142p2_018171

USDA. (n.d.b.). Natural resources Conservation Service. Retrieved February 27, 2021, from https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/plantsanimals/pollinate/

USDA. (2020a) State ranking based on cash receipts by commodity for 2019. Retrieved April 4, from https://data.ers.usda.gov/reports.aspx?ID=17844

USDA. (2020b) "Farms and Land in Farms 2019 Summary," Retrieved April 4, from https://www.nass.usda.gov/Publications/Todays_Reports/reports/fnlo0220.pdf