Maryland General Assembly
Senate Education, Energy, and the Environment Committee
March 4, 2024

Testimony of Ranked Choice Voting Resource Center on Senate Bill 493

On behalf of the Ranked Choice Voting Resource Center (RCVRC), we are pleased to offer this informational testimony on Senate Bill 493.

The RCVRC is a 501(c)(3) nonpartisan nonprofit that helps make ranked-choice voting elections successful. We provide best practices, software tools, educational material, and other resources for ranked choice voting implementation to anyone interested in the voting method. With decades of experience administering elections, our team has also administered statewide, municipal, and district-level ranked-choice voting elections.

I. Introduction

With ranked choice voting, voters rank candidates in order of preference. Candidates running in ranked choice voting elections do best when they attract a strong core of first-choice support while also reaching out for second, third, and later choices. When used to elect a single candidate like a mayor or governor, ranked choice voting helps elect a candidate that better reflects the preferences of most voters.[1] Ranked choice voting can also be used for presidential primaries to allocate delegates proportionally or using winner-take-all. Bottoms-up RCV is used to allocate delegates proportionally. Last-place candidates are eliminated until all remaining remaining candidates are above a predetermined percentage threshold set by that party.[2]

Ranked choice voting, in both its single-winner and proportional forms, has now been implemented in elections of all types in the United States. This includes local elections in cities such as San Francisco, California, Minneapolis, Minnesota, and New York City, New York, as well as state and federal contests in Alaska and Maine.[3] RCV was used in the 2020 Democratic presidential primaries in Alaska, Hawaii, Kansas, Nevada, and Wyoming. Maine will use RCV in its 2024 presidential primary and the Republicans in the U.S. Virgin Islands have already used RCV in their presidential primary this year. While election administration practices vary across the country, updates necessary to implement ranked choice voting fall into a few standard categories:

- Voting systems (software and/or hardware)

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[1] *How Ranked Choice Voting Works*, City of Portland, Maine (May 12, 2021), https://www.youtube.com/watch?v=4UtDFAqLC0Y.
[2] Deb Otis, *Ranked Choice Voting in 2020 Presidential Primary Elections*, FairVote (July 21, 2020), https://fairvote.org/report/ranked_choice_voting_in_2020_presidential_primary_elections/.
[3] *Where It's Used*, Ranked Choice Voting Resource Center, https://www.rcvresources.org/where-its-used.

- Ballot design;
- Voter education;
- Results centralization; and
- Results display.

Each of these updates will be discussed briefly below.

II. Voting Systems

Voting systems are the software and hardware used to run elections. Among other functions, they provide election administrators the ability to design ballots, program machines to capture votes, and efficiently count up results totals in elections.[4] The current voting systems used in Maryland are DS200, DS850, and/or ExpressVote equipment.

To run ranked choice voting elections, voting systems must produce data known as a cast-vote record. According to our conversations with each of the voting system vendors, all modern voting systems are ranked choice voting capable.[5] We have also developed ranked choice voting counting software, known as RCTab, which can be used in addition to voting systems to produce ranked choice voting results.[6] The RCTab software is available for free via this link: http://github.com/brightspots/rcv.

III. Ballot Design

Ranked choice voting elections require voters to interact with a style of ballot that allows them to rank candidates in order of preference. Maine's sample ballots from both the Democratic and Republican presidential primaries are included in the appendix. The Center for Civic Design (CCD) produced best practice reports for designing and introducing ranked choice voting ballots. These should be relied upon for designing any ranked choice voting ballots. Those reports are available on our website, as well as on CCD's website.[7]

2024 Democratic Presidential Primary Sample Ballot Grad

President of the U.S.	1st Choice	2nd Choice	3rd Choice
Biden, Joseph R., Jr.	⬭	⬭	⬭
Phillips, Dean B.	⬭	⬭	⬭
Write-in	⬭	⬭	⬭

[4] Election Terminology Glossary, "Voting System," National Institute of Standards and Technology, https://pages.nist.gov/ElectionGlossary/.
[5] *Major Voting Equipment Vendors' Ranked Choice Voting Capabilities*, Ranked Choice Voting Resource Center (May 2019), https://drive.google.com/file/d/0B3K2g6lIQMWsWmJDYWRvMjdqM28/view?resourcekey=0-drPnMVVx2Z-G190NcMhPsQ.
[6] RCTab can also be used as a verification tool post-election, provided it is not used to produce official results.
[7] *Reports*, Ranked Choice Voting Resource Center, https://www.rcvresources.org/reports (at the bottom of page); *Design principles for ranked choice voting,* Center for Civic Design, https://civicdesign.org/projects/rcv/.

IV. Voter Education

Educating the public about ranked choice voting is a necessary part of administering a successful ranked choice voting election. Specifically, voters need to be taught two things: how to mark the ballot and how votes are counted. Up to and on election day, voters are most interested in learning how to mark their ballot. Voter education should focus on this aspect during that time frame. Materials, such as videos and handouts, describing how votes are tabulated should be made available during this time but will be most valuable after polling places close. Ideally, ranked choice voting education and outreach will complement existing efforts for voters, candidates, and election officials. Such efforts also benefit from coordination with community and civic organizations throughout the State. Previous implementations have proven that the most impactful and inexpensive voter education method is verbal and written instruction when the voters present themselves to vote. The RCVRC website provides links to a variety of education and outreach methods that have been used by jurisdictions.[8] In addition, organizations like Democracy Rising provide voter education support for ranked choice voting jurisdictions.[9]

V. Ranked Choice Voting Results

Determining the winners in a ranked choice voting election requires producing a round-by-round count to determine the winner or winners in an election. Running this round-by-round count means election administrators need to have the candidate ranking order on each ballot to know 1) who has the fewest votes in the election and 2) who is ranked next on each of those ballots. Election administrators also need to know how many ballots were cast in total to determine how many votes candidates must have to win. This means two things for producing ranked choice voting results: all ballot data must be available, and it must be centralized. Ranked choice voting requires that election officials centralize ballot data known as cast vote records (CVRs) to run the round-by-round count. After these cast vote records are centralized, that data can be run through ranked choice voting counting software, such as RCTab, to produce round-by-round results – which only takes seconds or minutes – and determine which candidates emerge with the most votes.

The timeline for centralizing final cast vote record data and determining final round-by-round results depends on the size of the jurisdiction producing results, the technology available to centralize results data, and any laws regulating when ballots can arrive after election day and still be counted in an election. Jurisdictions using ranked choice voting now produce round-by-round results as early as election night, with regular updates to those election night

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[8] *Voter Education and Outreach*, Ranked Choice Voting Resource Center, https://www.rcvresources.org/blog-post/voter-education-outreach.
[9] Democracy Rising, https://www.wearedemocracyrising.org/.

results as more ballots are counted and more cast vote record data is centralized.[10] All jurisdictions using RCV use paper ballots for their elections and centralize their election data using standard election material centralization processes. Election administrators in the City of Minneapolis, for example, scan in or hand count paper ballots at precincts on election day. They then send ranked choice voting data or ranked choice ballots to the city elections office, which produces round-by-round results the day after election day.

SB493 enacts RCV for use in the 2028 primary for president. Producing the round-by-round count requires administrators to have RCV tabulation software compatible with the state's RCV counting rules and the data coming out of their voting systems. Maryland has voting systems from a single vendor, ES&S, which makes running the round-by-round count simpler than if they had systems from multiple vendors. Either ES&S's ExpressRunoff software or RCVRC's RCTab could be used to run the round-by-round count on those CVRs.[11] The tabulator is open source and available for free from RCVRC.[12]

When the cast vote records begin to arrive, they could be uploaded to a secure, non-internet-connected, computer which could then process the round-by-round count and produce unofficial ranked choice voting results. Depending on how long polling places take to wrap up counting on election night, these unofficial round-by-round results could begin to be produced within hours after polls close. Results could be updated as ballots are added to totals. The timing of those updates depends on how Maryland chooses to adapt any existing results reporting procedures to ranked choice voting.

Before unofficial round-by-round results are produced, first-choice totals can be reported as unofficial results. First-choice totals are simple to produce: results tapes from voting equipment can print out first-choice totals in ranked choice voting elections, just as they print out vote totals in non-ranked choice voting elections. As with non-ranked choice voting elections, those results can be reported back to the appropriate elections office, which can combine totals and publish just first-choice totals. First-choice results can only serve as temporary unofficial results, however. Ranked choice voting results will ultimately require round-by-round results to determine final winners.

After round-by-round results are produced, displaying them in an easy-to-understand format is fundamental to ensuring voters understand and accept the results. RCVis.com implements best practices for displaying those results and is free to use. It is compatible with results data from

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[10] Dept. of Elections, *Nov. 3, 2020 Election Results - Detailed Reports*, City and County of San Francisco, https://sfelections.sfgov.org/november-3-2020-election-results-detailed-reports (Preliminary Reports are uploaded on a regular basis starting on election day and continuing daily thereafter); Utah County Elections Division, *Ranked Choice Election Results*, Utah County, https://www.utahcounty.gov/Dept/ClerkAud/Elections/2021RankedResults.asp (results uploaded on election night and on a regular basis thereafter).

[11] Ranked Choice Voting Resource Center, *RCTab*, www.rcvresources.org/rctab (last visited Feb. 22, 2024).

[12] The tabulator is compatible with Dominion, ES&S, Hart, and Unisyn data.

ES&S, Dominion, and RCTab ranked choice voting contests.[13] CCD has also produced a report describing best practices for results reporting.[14]

VI. Post-Election Audits of Ranked Choice Voting

Election officials conduct post-election audits to ensure votes are recorded and tallied as cast and to help ensure public confidence in elections. Two primary types of audits exist: conventional audits and risk-limiting audits. Ranked choice voting elections in the United States are regularly subject to conventional audits. Conventional or traditional audits have two major steps:

1) Election administrators randomly select voting machines used in a given election; then,
2) Election administrators compare the paper record of ballots from the machines being audited to the digital results produced by those voting machines.[15]

Single-winner and proportional RCV races in the Bay Area and Minneapolis are regularly audited using conventional audit procedures. For example, Minneapolis randomly selects two RCV contests to audit – one single-winner and one proportional. The City then selects one precinct from each contest and city staff review every ballot in that precinct by hand. City of Minneapolis staff compare the total number of rankings each candidate received in that precinct to digital records from the scanners used in each precinct. If these totals match, the audit is complete. If vote totals differ, the audit will expand. Bay Area audits follow similar procedures.[16]

Risk-limiting audits (RLAs) are the gold standard of post-election tabulation audits. They review a randomized sample of ballots to provide strong evidence that the election outcome is correct. Risk-limiting audits are the most efficient type of audit (regardless of voting method) and can be implemented through a variety of methods in single-winner RCV contests and presidential primaries using RCV. RLAs are reliable and efficient, but they are uncommon in the United States and have rarely been used in RCV elections. Additional RLAs of RCV need to be

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[13] RCTab is the RCVRC's open-source ranked choice voting counting software which can be used alongside voting systems to produce ranked choice voting results. The RCTab software is available for free via this link: http://github.com/brightspots/rcv.

[14] Whitney Quesenbery and Taapsi Ramchandani, *Best Practices for Ranked Choice Voting Ballots and Other Materials*, Center for Civic Design (Feb. 28, 2017), https://drive.google.com/file/d/1T_u5h4RZ1rTu6_0BXnxBVDSrndsGF0V9/view; *Reports*, Ranked Choice Voting Resource Center, https://www.rcvresources.org/reports.

[15] Audit laws may be written to audit precincts or to audit machines. Either way, voting machines are the things being reviewed – in a precinct-based law, the voting machines used in that precinct are audited. In a voting machine law, a random assortment of machines from across the election jurisdiction (city, county or state) are audited, instead of a specific precinct.

[16] For more on conventional audits of RCV, see our Auditing RCV webinar. Ranked Choice Voting Resource Center, Auditing Ranked Choice Voting, https://www.rcvresources.org/auditing-ranked-choice-voting (March 29, 2018).

conducted to firmly establish RCV RLA practices and tools and to ease RCV RLA adoption across the United States.[17]

VII. Conclusion

SB493 offers a valuable opportunity for Maryland to adopt ranked choice voting for its presidential primary in 2028. As discussed in this testimony, there are concrete, actionable steps Maryland can take to implement ranked choice voting. The RCVRC stands ready to assist with any ranked choice voting implementation, free of charge.

Thank you again for the opportunity to comment.

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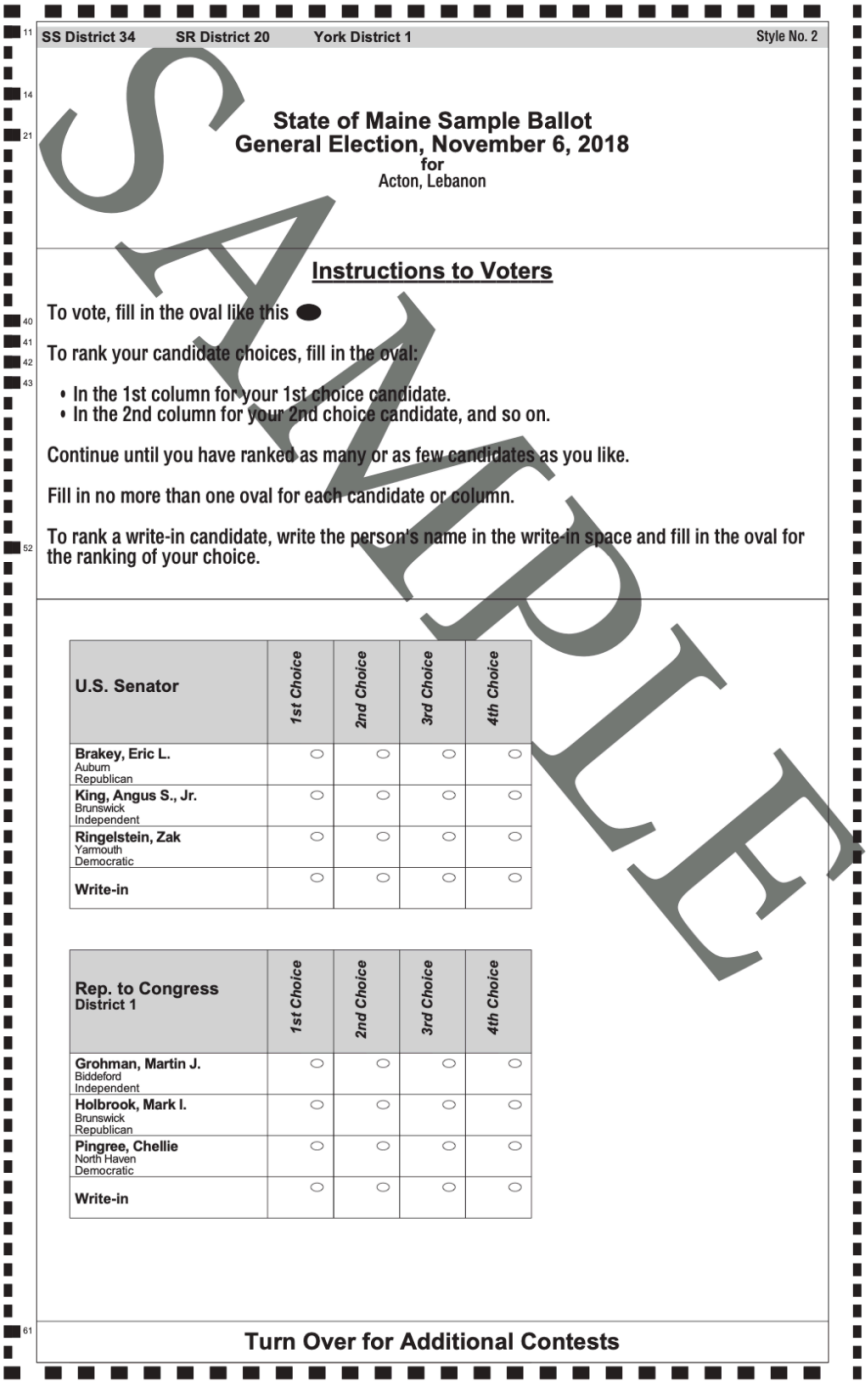
[17] For more on RLAs of RCV, see our Post-Election Audits and RCV policy brief. Chris Hughes & Ryan Kirby, Post-Election Audits and Ranked Choice Voting, https://www.rcvresources.org/blog-post/post-election-audits-and-ranked-choice-voting (Sept. 19, 2022).

Appendix

Exhibit 1. ES&S Ballot, Maine Congressional District 1, Nov. 6, 2018.



SS District 34 SR District 20 York District 1 Style No. 2

State of Maine Sample Ballot
General Election, November 6, 2018
for
Acton, Lebanon

Instructions to Voters

To vote, fill in the oval like this ●

To rank your candidate choices, fill in the oval:

- In the 1st column for your 1st choice candidate.
- In the 2nd column for your 2nd choice candidate, and so on.

Continue until you have ranked as many or as few candidates as you like.

Fill in no more than one oval for each candidate or column.

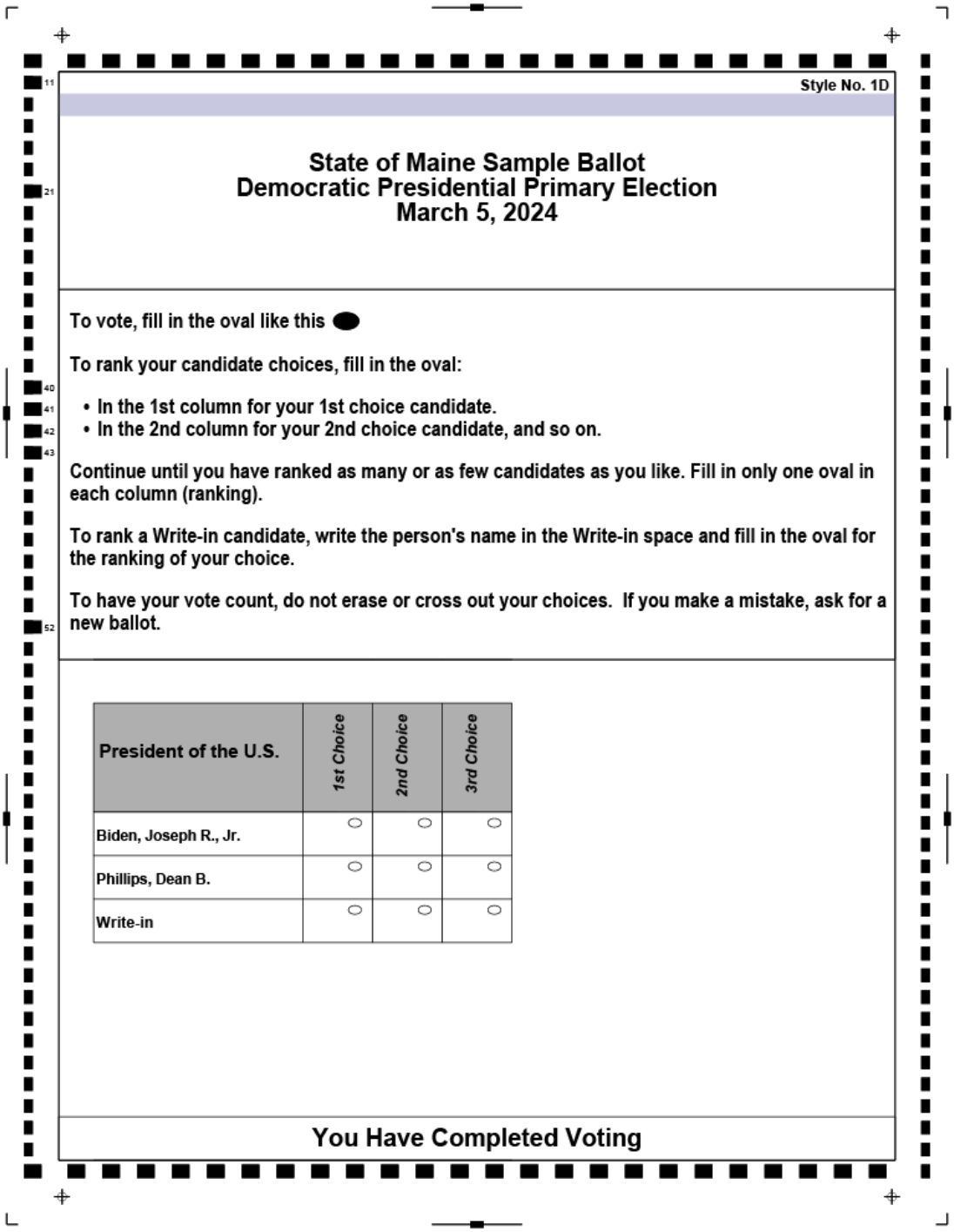
To rank a write-in candidate, write the person's name in the write-in space and fill in the oval for the ranking of your choice.

U.S. Senator	1st Choice	2nd Choice	3rd Choice	4th Choice
Brakey, Eric L. Auburn Republican	○	○	○	○
King, Angus S., Jr. Brunswick Independent	○	○	○	○
Ringelstein, Zak Yarmouth Democratic	○	○	○	○
Write-in	○	○	○	○

Rep. to Congress District 1	1st Choice	2nd Choice	3rd Choice	4th Choice
Grohman, Martin J. Biddeford Independent	○	○	○	○
Holbrook, Mark I. Brunswick Republican	○	○	○	○
Pingree, Chellie North Haven Democratic	○	○	○	○
Write-in	○	○	○	○

Turn Over for Additional Contests

Exhibit 2. ES&S Ballot, Maine Democratic Presidential Primary, March 5, 2024.



Style No. 1D

State of Maine Sample Ballot
Democratic Presidential Primary Election
March 5, 2024

To vote, fill in the oval like this ●

To rank your candidate choices, fill in the oval:

- In the 1st column for your 1st choice candidate.
- In the 2nd column for your 2nd choice candidate, and so on.

Continue until you have ranked as many or as few candidates as you like. Fill in only one oval in each column (ranking).

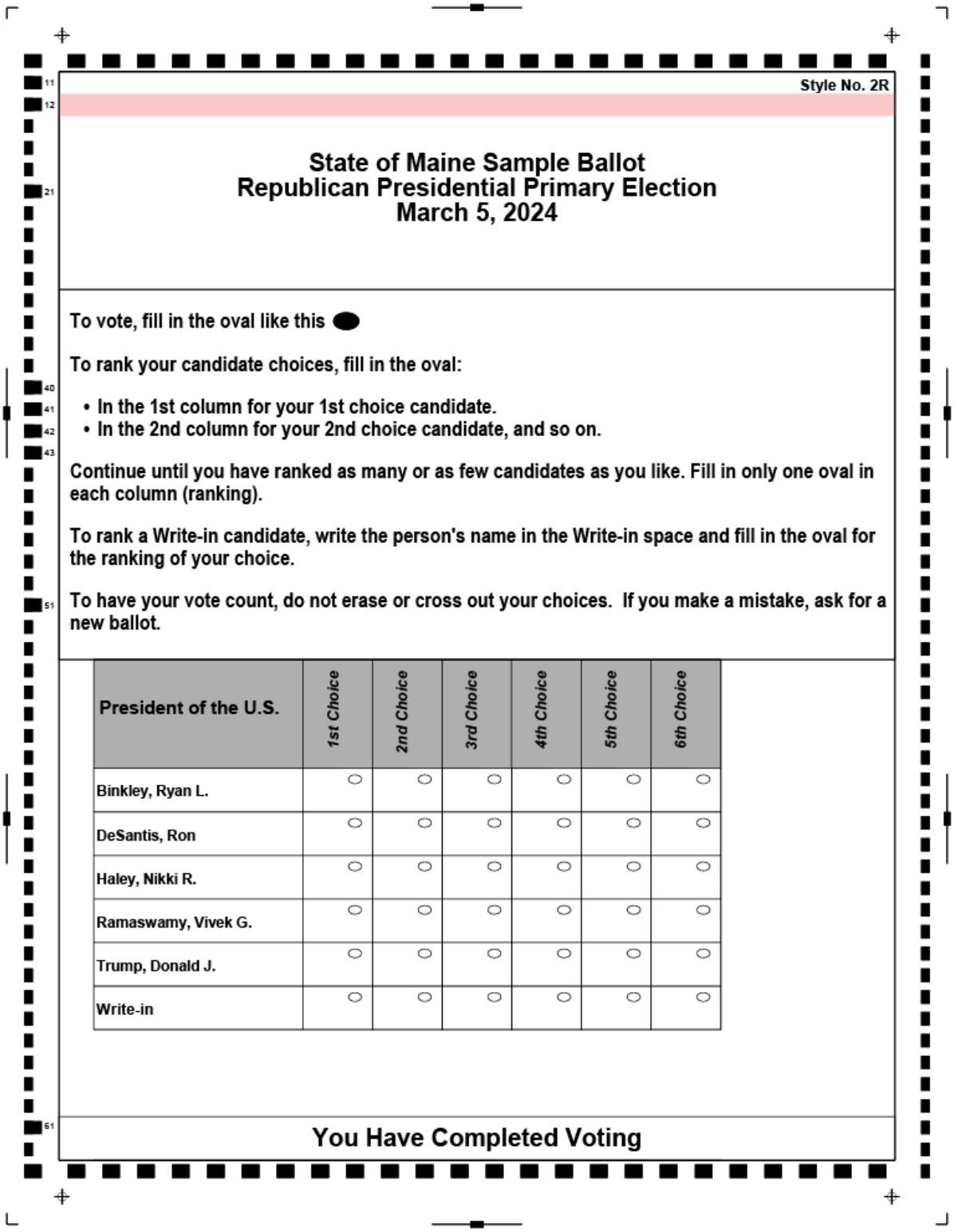
To rank a Write-in candidate, write the person's name in the Write-in space and fill in the oval for the ranking of your choice.

To have your vote count, do not erase or cross out your choices. If you make a mistake, ask for a new ballot.

President of the U.S.	1st Choice	2nd Choice	3rd Choice
Biden, Joseph R., Jr.	○	○	○
Phillips, Dean B.	○	○	○
Write-in	○	○	○

You Have Completed Voting

Exhibit 3. ES&S Ballot, Maine Republican Presidential Primary, March 5, 2024.



Style No. 2R

State of Maine Sample Ballot
Republican Presidential Primary Election
March 5, 2024

To vote, fill in the oval like this ●

To rank your candidate choices, fill in the oval:

- In the 1st column for your 1st choice candidate.
- In the 2nd column for your 2nd choice candidate, and so on.

Continue until you have ranked as many or as few candidates as you like. Fill in only one oval in each column (ranking).

To rank a Write-in candidate, write the person's name in the Write-in space and fill in the oval for the ranking of your choice.

To have your vote count, do not erase or cross out your choices. If you make a mistake, ask for a new ballot.

President of the U.S.	1st Choice	2nd Choice	3rd Choice	4th Choice	5th Choice	6th Choice
Binkley, Ryan L.	○	○	○	○	○	○
DeSantis, Ron	○	○	○	○	○	○
Haley, Nikki R.	○	○	○	○	○	○
Ramaswamy, Vivek G.	○	○	○	○	○	○
Trump, Donald J.	○	○	○	○	○	○
Write-in	○	○	○	○	○	○

You Have Completed Voting

RANKED CHOICE VOTING RESOURCE CENTER | ELECTION ADMINISTRATION RESOURCE CENTER

Exhibit 4. ES&S Results Report, Maine Congressional District 2, Nov. 6, 2018.

Report Name	**Summary Report**
Election Name	**General Election**
Election Date	**11.06.18**
Office Title	**Congressional District 2**

	Round 1			Round 2	
Candidate Names	**Votes**	**Percentage**	**Transfer**	**Votes**	**Percentage**
Bond, Tiffany L.	16552	05.71%	-16552	0	00.00%
DEM Golden, Jared F.	132013	45.58%	**10427**	**142440**	**50.62%**
Hoar, William R.S.	6875	02.37%	-6875	0	00.00%
REP Poliquin, Bruce	**134184**	**46.33%**	**4747**	138931	49.38%
Ballot Exhausted					
By Overvotes	435		98	533	
By Undervotes	6018		7820	13838	
By Exhausted Choices	0		335	335	
Continuing Ballots	289624		0	281371	
TOTAL	**296077**		**0**	**296077**	
Winning threshold by round	144813			140686	

Generated: 11/21/2018 19:36

Total = Ballot Exhausted by Overvotes + Ballot Exhausted by Undervotes + Exhausted Ballot + Continuing Ballots

Winning Threshold = [Continuing ballots/(Vote for [number] +1)] + 1

"*" symbol signifies elimination due to Tie Resolution.