

2022 Intermountain Region Broad-Scale Bird Monitoring Report

January 12, 2023

John A. Shivik, Regional Wildlife Program Manager

Background: Salient Aspects of 2012 (219.12) and Executive Order 13186

The purpose of monitoring is to provide continuous feedback for the planning cycle by testing relevant assumptions, tracking relevant conditions over time, and measuring management effectiveness. Monitoring reports document whether a change to plans or the monitoring program is warranted, whether a new assessment may be needed, or whether there is no need for change at the time (219.5).

The purpose of the Intermountain Region Bird Monitoring Report is to accomplish required monitoring at the larger, regional scale and to provide scientific information to biologists and decision makers. In accordance with the 2012 planning rule, this report provides succinct information on the status of focal and other species of concern, which provides information for assessing the effectiveness of current forest management.

Relative to Migratory Bird Treaty act and Executive Order 13186, the information provides insight about the species that may be most affected by land management actions under Forest Service authority. The underlying monitoring question is: do population trends indicate that some species need more, or less, consideration in project and plan revision decisions?

Data Collection and Analysis: Integrated Monitoring in Bird Conservation and Breeding Bird Survey

The Intermountain Region has been funding broad-scale monitoring of bird communities in partnership with state and federal agencies, the Bird Conservancy of the Rockies, Intermountain Bird Observatory, and the Great Basin Bird Observatory; the effort is known as Integrated Monitoring in Bird Conservation Regions (IMBCR). Yearly reports and trend data are produced by the Bird Conservancy of the Rockies, and the 2021 trend data (see link to trend data at: <https://rmbo.org/v3/avian/ExploretheData.aspx> accessed December, 2022) were used to compile this monitoring report. Sufficient data (beginning when all forests were sampled) to estimate trend at the regional scale began in 2017, but at the forest scale, some units have more historical information. Refer to McLaren et al. (2020) for data reporting methods, assumptions, and cautions about data use.

The Breeding Bird Survey (BBS) has also been used for bird population estimates and large-scale summaries (e.g., Rosenberg et. al 2019). Using Breeding Bird Survey (BBS) information to evaluate populations for species on a specific national forest should be done with caution, however, because data collection was not stratified for each forest, most survey routes do not occur on, or only partially overlap USFS lands, and sampling has been intermittent over time. The BBS data do provide information about bird biodiversity through time, however, by

summarizing the mean number of species detected each year on routes overlapping USFS lands.

Results and Assessment

The focus in this report is on trends for monitored bird species at the larger, regional, scale. Species with and without conservation status (e.g., Regional Forester's Sensitive Species) are listed, but for IMBCR, only species with a high confidence estimate are included in the body of the report (Table 2). Medians are reported instead of means for easier interpretation as distributions sometimes have long tails that overly-influence the value of the mean. Only species monitored by IMBCR with a confidence estimate rounding to or above 0.9 (i.e. > 0.85) and based on at least 3 observations are included in Table 1 (a more comprehensive list of species is provided in Appendix 1).

Overall, the trend is stable to slightly positive ($\bar{x}=1.07$, Figure 1) for the 78 species with high confidence population trend estimates; there were 31 species declining and 47 species increasing (Table 1). Although varying numbers of yearly surveys were made since the 1968, the BBS data suggest increasing bird biodiversity at the regional scale from the 1970s through the mid-1980s and then stable species counts until present (Figure 2).

Table 1. Trends for Intermountain Region Birds with Reliable Trend Estimates, 2017-2021

Species	Mean	LCI90	Median	UCI90	Conf.	N. Detect
Ring-necked Pheasant	0.405	0.093	0.270	1.038	0.940	4
Black Rosy-Finch	0.392	0.138	0.325	0.901	0.970	15
Band-tailed Pigeon	0.588	0.218	0.493	1.185	0.904	4
Swainson's Hawk	0.608	0.153	0.529	1.416	0.898	14
Rock Pigeon	0.557	0.395	0.551	0.747	0.996	30
Downy Woodpecker	0.609	0.409	0.590	0.820	0.990	40
Mountain Quail	0.673	0.444	0.657	0.933	0.964	49
California Quail	0.699	0.486	0.680	0.976	0.964	37
Bank Swallow	0.729	0.336	0.705	1.148	0.886	13
Pacific Wren	0.729	0.511	0.717	0.990	0.952	25
Golden Eagle	0.754	0.471	0.743	1.084	0.896	20
Black-billed Magpie	0.779	0.685	0.770	0.894	0.998	252
Canyon Wren	0.787	0.629	0.780	0.977	0.966	66
Sagebrush Sparrow	0.802	0.665	0.794	0.954	0.988	265
Bullock's Oriole	0.824	0.539	0.814	1.132	0.851	30
Red-winged Blackbird	0.863	0.665	0.852	1.114	0.873	52
Chukar	0.873	0.747	0.865	1.022	0.922	114
Golden-crowned Kinglet	0.879	0.727	0.876	1.056	0.892	110
American Crow	0.892	0.757	0.885	1.036	0.900	94
Northern Mockingbird	0.897	0.765	0.886	1.052	0.876	68
Rock Wren	0.898	0.854	0.896	0.942	0.996	1165
Lincoln's Sparrow	0.929	0.837	0.925	1.027	0.882	540
Nashville Warbler	0.942	0.870	0.939	1.031	0.878	322
Ruby-crowned Kinglet	0.941	0.909	0.940	0.974	0.996	2564
Brown-headed Cowbird	0.943	0.860	0.941	1.023	0.876	283
Hermit Thrush	0.949	0.901	0.947	1.002	0.944	3098
Red Crossbill	0.953	0.878	0.954	1.031	0.857	538
Dark-eyed Junco	0.954	0.918	0.954	0.989	0.992	4771
Common Raven	0.964	0.911	0.963	1.025	0.865	1235
Spotted Towhee	0.972	0.948	0.971	0.999	0.952	2893
Red-breasted Nuthatch	0.980	0.950	0.980	1.010	0.867	1707
Dusky Flycatcher	1.035	0.997	1.034	1.077	0.930	2242
Western Tanager	1.034	0.994	1.036	1.070	0.914	4068
Green-tailed Towhee	1.037	0.997	1.036	1.080	0.930	3504
Northern Flicker	1.040	0.999	1.041	1.084	0.944	1430
Hairy Woodpecker	1.053	0.992	1.052	1.110	0.936	476
Mountain Bluebird	1.062	0.959	1.060	1.162	0.855	837
Brown Creeper	1.071	0.974	1.067	1.178	0.882	237
Swainson's Thrush	1.072	0.998	1.070	1.151	0.946	881

Species	Mean	LCI90	Median	UCI90	Conf.	N. Detect
Black-throated Sparrow	1.079	0.996	1.077	1.164	0.936	367
Cassin's Vireo	1.080	1.006	1.083	1.149	0.960	194
Plumbeous Vireo	1.092	0.958	1.084	1.242	0.884	352
Steller's Jay	1.092	0.997	1.088	1.190	0.944	533
Blue-gray Gnatcatcher	1.091	1.016	1.090	1.174	0.978	607
Black-headed Grosbeak	1.096	1.023	1.096	1.162	0.988	949
Western Meadowlark	1.100	0.993	1.096	1.223	0.928	1147
Red-tailed Hawk	1.102	0.963	1.100	1.257	0.859	180
Lesser Goldfinch	1.115	0.958	1.107	1.296	0.873	92
Vesper Sparrow	1.108	0.993	1.107	1.223	0.934	1370
White-breasted Nuthatch	1.116	1.023	1.114	1.225	0.974	217
Black-throated Gray Warbler	1.124	1.029	1.120	1.220	0.990	1128
Olive-sided Flycatcher	1.128	1.033	1.125	1.228	0.982	328
Lark Sparrow	1.136	1.042	1.135	1.237	0.990	405
Yellow-breasted Chat	1.149	0.950	1.150	1.370	0.886	53
Cordilleran Flycatcher	1.161	1.006	1.154	1.335	0.958	147
Violet-green Swallow	1.169	1.065	1.166	1.289	0.996	265
Dusky Grouse	1.176	0.957	1.168	1.433	0.894	58
Gray Catbird	1.194	0.949	1.173	1.497	0.894	33
Wild Turkey	1.192	0.953	1.185	1.450	0.908	40
Song Sparrow	1.189	1.099	1.186	1.295	1.000	328
Western Flycatcher	1.205	1.061	1.203	1.347	0.990	159
Pygmy Nuthatch	1.221	0.958	1.209	1.495	0.918	68
Bushtit	1.216	1.086	1.212	1.361	0.996	161
Horned Lark	1.218	1.038	1.213	1.415	0.964	496
Pileated Woodpecker	1.231	0.914	1.219	1.563	0.867	33
House Finch	1.235	1.017	1.228	1.483	0.968	190
Savannah Sparrow	1.244	0.975	1.232	1.563	0.920	40
Northern Rough-winged Swallow	1.355	0.880	1.285	2.025	0.865	18
Common Nighthawk	1.341	1.154	1.332	1.559	0.996	177
White-headed Woodpecker	1.381	1.092	1.367	1.751	0.978	27
Willow Flycatcher	1.589	0.858	1.421	3.025	0.873	28
Cliff Swallow	1.536	1.049	1.509	2.063	0.974	42
Grace's Warbler	1.675	0.985	1.570	2.613	0.942	206
Bald Eagle	1.760	0.920	1.614	3.069	0.912	6
Scott's Oriole	1.756	1.106	1.629	2.782	0.974	13
Loggerhead Shrike	2.675	0.751	2.283	5.808	0.896	5
Grasshopper Sparrow	3.074	0.793	2.355	7.381	0.896	3
Northern Waterthrush	2.926	1.171	2.660	5.638	0.970	3

Reliable Trend Estimate=confidence in trend >0.85 and Number of Detections > 2. Mean=mean trend for the region 2017-2019; LCI90=lower credible interval of the mean; Median=median trend for the region 2017-2021: <1.0 indicates downward population trend, 1.0 indicates stable trend, and >1.0 indicates increasing trend. UCI90=upper credible interval of the mean; Conf.=confidence in the direction of the reported trend of the mean, e.g., 0.83 suggests 83% confidence in the direction of an observed trend (but not its magnitude); N. Detect=number of surveys where the species was detected.

Figure 1. Trends of Bird Species on Region 4 Forest System Lands 2017-2019

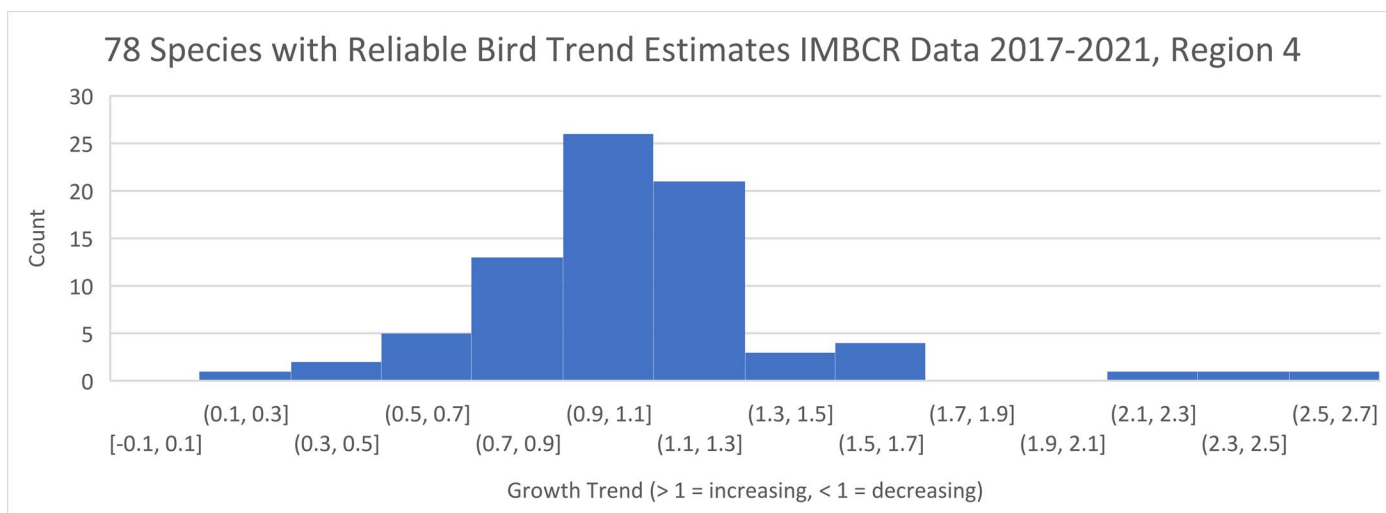
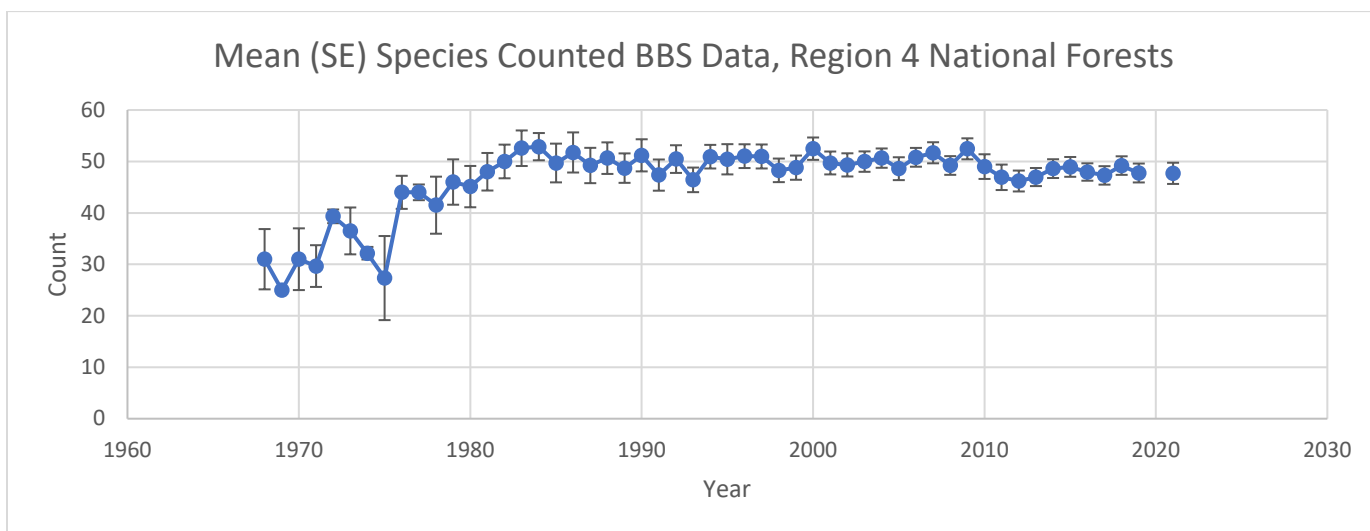


Figure 2. Mean Bird Species Counts on BBS Routes Transecting Region 4 Forest System Lands



References

Bird Conservancy of the Rockies, 2021 trend data are in spreadsheet files lined to at:

<https://rmbo.org/v3/avian/ExploretheData.aspx>

Breeding Bird Survey data were extracted from online map tools. The location of each BBS route within each state can be identified at:

<https://databasin.org/datasets/0fe0ebbb1b04111b0ba1579b89b7420/>

and species counts can be determined at:

<https://www.pwrc.usgs.gov/bbs/RouteMap/Map.cfm>

Idaho Department of Fish and Game. 2017. Idaho State Wildlife Action Plan, 2015. Boise (ID): Idaho Department of Fish and Game. Grant No.: F14AF01068 Amendment #1. Available from: <http://fishandgame.idaho.gov/>. Sponsored by the US Fish and Wildlife Service, Wildlife and Sport Fish Restoration Program.

McLaren, M. F., Smith, M., Timmer, J. M., Drilling, N. E., Green, A. W., Leslie, B. J., White, C. M., Van Lanen, N. J., Pavlacky Jr., D. C., Sparks, R. A., & Van Boer, A. G. (2020). Integrated Monitoring in Bird Conservation Regions (IMBCR): 2019 Field Season Report. Bird Conservancy of the Rockies. Brighton, Colorado, USA.

Nevada Wildlife Action Plan. Wildlife Action Plan Team. 2012. Nevada Wildlife Action Plan. Nevada Department of Wildlife, Reno.

Kenneth V. Rosenberg, Adriaan M. Dokter, Peter J. Blancher, John R. Sauer, Adam C. Smith, Paul A. Smith, Jessica C. Stanton, Arvind Panjabi, Laura Helft, Michael Parr, and Peter P. Marra. 2019. Decline of North American Avifauna. *Science* 366, 120–124.

Utah Wildlife Action Plan Joint Team. 2015. Utah Wildlife Action Plan: A plan for managing native wildlife species and their habitats to help prevent listing under the Endangered Species Act. Publication number 15-14. Utah Division of Wildlife Resources, Salt Lake City, Utah, USA.

Wyoming 2017 Species of Greatest Conservation Need, Final January 2016

Appendix 1. Master List of Birds Monitored

Alphabetized master list of bird species monitored, or with conservation status, in Region 4. LCI90=lower credible interval of the mean; Median=median trend for the region 2017-2021: <1.0 indicates downward population trend, 1.0 indicates stable trend, and >1.0 indicates increasing trend. UCI90=upper credible interval of the mean; Conf.=confidence in the direction of the reported trend of the mean, e.g., 0.83 suggests 83% confidence in the direction of an observed trend (but not its magnitude); N. Detect=number of surveys where the species was detected. Status=USFS TESS, MIS or State Wildlife Action Plan status. Blank cells indicate no IMBCR data for the species.

Species	LCI90	Median	UCI90	Conf.	N. Detect	Status
American avocet						Y
American bittern						Y
American Crow	0.757	0.885	1.036	0.900	94	N
American Dipper	0.197	0.439	1.266	0.902	2	N
American Goldfinch	0.467	0.770	1.163	0.841	53	N
American Kestrel	0.838	1.022	1.215	0.576	62	Y
American pipit	0.651	0.847	1.105	0.839	122	Y
American Robin	0.971	0.995	1.020	0.643	4222	N
American Three-toed Woodpecker	0.829	1.032	1.262	0.610	64	N
American white pelican	0.421	1.192	3.588	0.622	1	Y
Anna's Hummingbird	0.261	0.779	2.330	0.675	5	N
Ash-throated Flycatcher	0.870	0.954	1.046	0.811	221	Y
Baird's sparrow						Y
Bald Eagle	0.920	1.614	3.069	0.912	6	Y
Band-tailed Pigeon	0.218	0.493	1.185	0.904	4	Y
Bank Swallow	0.336	0.705	1.148	0.886	13	Y
Barn Swallow	0.102	0.549	2.728	0.739	16	N
Bell's vireo						Y
Belted Kingfisher	0.248	0.546	1.197	0.918	1	N
Bendire's thrasher						Y
Bewick's Wren	0.853	0.969	1.098	0.681	245	Y
Black Phoebe	0.611	1.246	2.605	0.721	1	N
Black Rosy-Finch	0.138	0.325	0.901	0.970	15	Y
Black swift						Y
Black tern						Y
Black-backed Woodpecker	0.664	0.979	1.433	0.456	12	Y
Black-billed cuckoo						Y
Black-billed Magpie	0.685	0.770	0.894	0.998	252	N
Black-capped Chickadee	0.881	1.020	1.209	0.582	184	N
Black-chinned Hummingbird	0.731	0.892	1.098	0.827	56	Y
Black-chinned Sparrow	0.945	1.055	1.166	0.785	142	Y

Species	LCI90	Median	UCI90	Conf.	N. Detect	Status
Black-crowned night-heron						Y
Black-headed Grosbeak	1.023	1.096	1.162	0.988	949	N
Black-throated Gray Warbler	1.029	1.120	1.220	0.990	1128	Y
Black-throated Sparrow	0.996	1.077	1.164	0.936	367	N
Blue grosbeak						Y
Blue-gray Gnatcatcher	1.016	1.090	1.174	0.978	607	Y
Blue-winged Teal	0.353	1.002	2.949	0.500	1	N
Bobolink						Y
Boreal owl						Y
Brewer's Blackbird	0.899	1.024	1.160	0.635	139	N
Brewer's Sparrow	0.959	0.998	1.048	0.486	2814	Y
Broad-tailed Hummingbird	0.943	1.043	1.137	0.795	476	N
Brown Creeper	0.974	1.067	1.178	0.882	237	N
Brown-capped rosy-finch						Y
Brown-headed Cowbird	0.860	0.941	1.023	0.876	283	Y
Bullock's Oriole	0.539	0.814	1.132	0.851	30	N
Burrowing owl						Y
Bushtit	1.086	1.212	1.361	0.996	161	Y
Cactus Wren	0.227	0.697	2.709	0.343	7	N
California condor						Y
California gull						Y
California Quail	0.486	0.680	0.976	0.964	37	N
California spotted owl						Y
Calliope Hummingbird	0.596	0.970	1.479	0.452	13	Y
Canada Goose	0.802	1.197	1.914	0.761	27	N
Canada Jay	0.865	1.006	1.177	0.528	222	N
Canvasback						Y
Canyon Wren	0.629	0.780	0.977	0.966	66	Y
Caspian tern						Y
Cassia crossbill						Y
Cassin's Finch	0.957	1.005	1.062	0.586	1261	Y
Cassin's Kingbird	0.569	1.434	3.239	0.737	5	?
Cassin's Vireo	1.006	1.083	1.149	0.960	194	N
Cattle egret						Y
Cedar Waxwing	0.743	1.142	1.625	0.685	59	N
Chestnut-collared longspur						Y
Chipping Sparrow	0.977	1.003	1.031	0.580	3022	N
Chukar	0.747	0.865	1.022	0.922	114	N
Clark's grebe						Y
Clark's Nutcracker	0.953	0.998	1.052	0.530	1438	Y
Cliff Swallow	1.049	1.509	2.063	0.974	42	N

Species	LCI90	Median	UCI90	Conf.	N. Detect	Status
Columbian sharp-tailed grouse						Y
Common Grackle	0.224	0.523	1.601	0.823	6	N
Common loon						Y
Common Merganser	0.129	0.491	1.898	0.821	4	N
Common Nighthawk	1.154	1.332	1.559	0.996	177	Y
Common Poorwill	0.728	1.002	1.381	0.504	26	N
Common Raven	0.911	0.963	1.025	0.865	1235	N
Common Yellowthroat	0.741	1.057	1.620	0.582	16	Y
Cooper's Hawk	0.758	1.212	1.901	0.781	20	N
Cordilleran Flycatcher	1.006	1.154	1.335	0.958	147	N
Costa's Hummingbird	0.373	0.991	2.542	0.492	3	N
Crissal Thrasher	0.474	0.723	1.051	0.932	1	N
Dark-eyed Junco	0.918	0.954	0.989	0.992	4771	N
Dickcissel						Y
Double-crested Cormorant	0.242	0.912	4.083	0.450	2	N
Downy Woodpecker	0.409	0.590	0.820	0.990	40	Y
Dusky Flycatcher	0.997	1.034	1.077	0.930	2242	N
Dusky Grouse	0.957	1.168	1.433	0.894	58	Y
Eastern Kingbird	0.498	0.988	1.899	0.484	1	N
Eurasian Collared-Dove	0.603	0.923	1.455	0.641	23	N
European Starling	0.174	1.791	16.264	0.661	4	N
Evening Grosbeak	0.632	0.886	1.248	0.691	51	N
Ferruginous Hawk	0.568	1.305	3.357	0.707	1	Y
Flammulated owl						Y
Forster's Tern						Y
Fox Sparrow	0.875	0.971	1.058	0.717	449	N
Franklin's Gull	0.190	0.516	1.373	0.863	2	Y
Gilded flicker						Y
Golden Eagle	0.471	0.743	1.084	0.896	20	Y
Golden-crowned Kinglet	0.727	0.876	1.056	0.892	110	N
Grace's Warbler	0.985	1.570	2.613	0.942	206	N
Grasshopper Sparrow	0.793	2.355	7.381	0.896	3	Y
Gray Catbird	0.949	1.173	1.497	0.894	33	N
Gray Flycatcher	0.909	0.981	1.062	0.681	532	N
Gray Vireo	0.861	0.982	1.126	0.592	256	Y
Gray-crowned rosy-finch						Y
Great basin willow flycatcher						Y
Great Blue Heron	0.465	1.035	2.557	0.524	7	Y
Great gray owl						Y
Great Horned Owl	0.510	0.920	1.463	0.631	18	N
Greater Sage-Grouse	0.079	0.420	3.819	0.775	3	Y

Species	LCI90	Median	UCI90	Conf.	N. Detect	Status
Greater sage-grouse, Bi-state						Y
Greater sandhill crane						Y
Green-tailed Towhee	0.997	1.036	1.080	0.930	3504	N
Green-winged Teal	0.758	2.192	5.920	0.890	1	N
Gunnison sage-grouse						Y
Hairy Woodpecker	0.992	1.052	1.110	0.936	476	Y
Hammond's Flycatcher	0.900	0.956	1.034	0.847	296	N
Harlequin duck						Y
Hermit Thrush	0.901	0.947	1.002	0.944	3098	N
Horned Lark	1.038	1.213	1.415	0.964	496	N
House Finch	1.017	1.228	1.483	0.968	190	N
House Wren	0.909	0.979	1.057	0.665	1324	N
Indigo Bunting	0.889	1.578	2.752	0.908	2	N
Juniper Titmouse	0.917	1.037	1.164	0.693	244	Y
Killdeer	0.583	1.062	2.063	0.574	20	N
Lark Bunting	0.492	0.765	1.097	0.928	1	N
Lark Sparrow	1.042	1.135	1.237	0.990	405	N
Lazuli Bunting	0.931	0.931	0.931	0.931	0.931	N
Le Conte's thrasher						Y
Least Flycatcher	0.196	1.066	4.566	0.530	6	N
Lesser Goldfinch	0.958	1.107	1.296	0.873	92	N
Lesser Scaup	0.388	0.676	0.976	0.956	1	N
Lewis's Woodpecker	0.690	1.225	2.076	0.757	16	Y
Lincoln's Sparrow	0.837	0.925	1.027	0.882	540	Y
Loggerhead Shrike	0.751	2.283	5.808	0.896	5	Y
Long-billed curlew						Y
Long-billed dowitcher						Y
MacGillivray's Warbler	0.966	1.009	1.059	0.641	1069	Y
Mallard	0.712	1.284	2.263	0.777	27	N
McCown's longspur						Y
Merlin	0.230	0.709	1.961	0.707	1	Y
Mexican spotted owl						Y
Mountain Bluebird	0.959	1.060	1.162	0.855	837	Y
Mountain Chickadee	0.974	1.003	1.027	0.580	3290	N
Mountain Plover						Y
Mountain Quail	0.444	0.657	0.933	0.964	49	Y
Mourning Dove	0.916	1.035	1.175	0.685	965	N
Nashville Warbler	0.870	0.939	1.031	0.878	322	N
Northern Flicker	0.999	1.041	1.084	0.944	1430	Y
Northern Goshawk	0.471	0.938	1.783	0.424	15	Y
Northern Harrier	0.583	0.928	1.516	0.574	28	N

Species	LCI90	Median	UCI90	Conf.	N. Detect	Status
Northern Mockingbird	0.765	0.886	1.052	0.876	68	N
Northern Pintail	0.616	1.169	2.356	0.681	1	Y
Northern Pygmy-Owl	0.698	1.234	3.765	0.739	9	Y
Northern Rough-winged Swallow	0.880	1.285	2.025	0.865	18	N
Northern Waterthrush	1.171	2.660	5.638	0.970	3	N
Olive-sided Flycatcher	1.033	1.125	1.228	0.982	328	Y
Orange-crowned Warbler	0.950	1.008	1.075	0.586	561	N
Osprey	0.602	1.774	7.101	0.819	7	N
Pacific Wren	0.511	0.717	0.990	0.952	25	N
Peregrine Falcon	0.357	0.745	1.180	0.839	14	Y
Pileated Woodpecker	0.914	1.219	1.563	0.867	33	Y
Pine Grosbeak	0.736	0.947	1.164	0.685	99	N
Pine Siskin	0.962	1.027	1.100	0.749	2913	N
Pinyon Jay	0.902	1.022	1.154	0.590	231	Y
Plumbeous Vireo	0.958	1.084	1.242	0.884	352	N
Prairie Falcon	0.378	0.822	1.570	0.731	8	Y
Purple martin						Y
Pygmy Nuthatch	0.958	1.209	1.495	0.918	68	Y
Red Crossbill	0.878	0.954	1.031	0.857	538	Y
Red-breasted Nuthatch	0.950	0.980	1.010	0.867	1707	N
Red-eyed Vireo	0.565	1.377	3.212	0.749	10	Y
Redhead						Y
Red-headed woodpecker						Y
Red-naped Sapsucker	0.933	1.095	1.266	0.835	135	Y
Red-necked phalarope						Y
Red-tailed Hawk	0.963	1.100	1.257	0.859	180	N
Red-winged Blackbird	0.665	0.852	1.114	0.873	52	N
Ring-billed Gull	0.255	0.759	2.313	0.657	3	Y
Ring-necked Pheasant	0.093	0.270	1.038	0.940	4	N
Rock Pigeon	0.395	0.551	0.747	0.996	30	N
Rock Wren	0.854	0.896	0.942	0.996	1165	N
Ruby-crowned Kinglet	0.909	0.940	0.974	0.996	2564	N
Ruffed Grouse	0.776	0.906	1.091	0.843	78	N
Rufous Hummingbird	0.609	1.002	1.475	0.502	15	Y
Rufous-crowned Sparrow	0.097	0.554	3.741	0.311	7	N
Sage (Sagebrush) Sparrow	0.665	0.794	0.954	0.988	265	Y
Sage Thrasher						Y
Sandhill Crane	0.845	1.063	1.324	0.657	75	Y
Savannah Sparrow	0.975	1.232	1.563	0.920	40	N
Say's Phoebe	0.528	1.036	4.393	0.546	15	N
Scott's Oriole	1.106	1.629	2.782	0.974	13	Y

Species	LCI90	Median	UCI90	Conf.	N. Detect	Status
Sharp-shinned Hawk	0.504	0.899	1.496	0.653	18	N
Sharp-tailed grouse						Y
Short-eared Owl	0.286	0.663	1.364	0.853	1	Y
Sierra Nevada mountain willow flycatcher						Y
Sierra Nevada mountain willow flycatcher						Y
Snowy egret						Y
Snowy plover						Y
Song Sparrow	1.099	1.186	1.295	1.000	328	Y
Sooty grouse						Y
Southwestern willow flycatcher						Y
Spotted Sandpiper	0.850	1.129	1.449	0.761	30	N
Spotted Towhee	0.948	0.971	0.999	0.952	2893	N
Spruce Grouse	0.202	0.513	1.246	0.904	2	N
Steller's Jay	0.997	1.088	1.190	0.944	533	N
Swainson's Hawk	0.153	0.529	1.416	0.898	14	Y
Swainson's Thrush	0.998	1.070	1.151	0.946	881	N
Three-toed woodpecker						Y
Townsend's Solitaire	0.949	1.026	1.109	0.717	389	N
Townsend's Warbler	0.835	0.934	1.038	0.849	330	N
Tree Swallow	0.822	0.996	1.184	0.488	193	N
Tricolored blackbird						Y
Trumpeter swan						Y
Turkey Vulture	0.589	0.934	1.494	0.631	42	N
Upland sandpiper						Y
Varied Thrush	0.453	0.840	1.359	0.747	1	N
Veery	0.267	0.510	1.201	0.906	2	Y
Vesper Sparrow	0.993	1.107	1.223	0.934	1370	N
Violet-green Swallow	1.065	1.166	1.289	0.996	265	N
Virginia Rail	0.425	1.343	4.536	0.689	2	Y
Virginia's Warbler	0.837	0.960	1.080	0.739	593	Y
Warbling Vireo	0.971	1.024	1.084	0.783	2589	Y
Western Bluebird	0.882	1.110	1.407	0.785	71	Y
Western burrowing owl						Y
Western Flycatcher	1.061	1.203	1.347	0.990	159	N
Western grebe						Y
Western Kingbird	0.741	0.940	1.169	0.709	33	N
Western least bittern						Y
Western Meadowlark	0.993	1.096	1.223	0.928	1147	N
Western sandpiper						Y

Species	LCI90	Median	UCI90	Conf.	N. Detect	Status
Western snowy plover						Y
Western Tanager	0.994	1.036	1.070	0.914	4068	Y
Western Wood-Pewee	0.956	1.009	1.061	0.618	997	N
Western yellow-billed cuckoo						Y
White-breasted Nuthatch	1.023	1.114	1.225	0.974	217	N
White-crowned Sparrow	0.873	0.977	1.096	0.649	1245	N
White-faced ibis						Y
White-headed Woodpecker	1.092	1.367	1.751	0.978	27	Y
White-tailed Ptarmigan	0.396	0.780	1.536	0.757	1	Y
White-throated Swift	0.777	1.068	1.451	0.647	95	?
White-winged Crossbill	0.602	1.380	3.470	0.731	2	?
Whooping crane						Y
Wild Turkey	0.953	1.185	1.450	0.908	40	Y
Williamson's Sapsucker	0.887	1.102	1.364	0.767	59	Y
Willow Flycatcher	0.858	1.421	3.025	0.873	28	Y
Wilson's phalarope						Y
Wilson's Snipe	0.630	0.959	1.506	0.564	73	N
Wilson's Warbler	0.913	1.079	1.255	0.775	115	N
Wood Duck	0.319	0.743	1.726	0.721	2	N
Woodhouse's Scrub-Jay	0.955	1.047	1.161	0.791	471	Y
Yellow Warbler	0.985	1.022	1.064	0.833	701	Y
Yellow-bellied sapsucker						Y
Yellow-billed cuckoo						Y
Yellow-breasted Chat	0.950	1.150	1.370	0.886	53	Y
Yellow-rumped Warbler	0.961	1.012	1.059	0.667	3740	Y
Yuma clapper rail						Y

Appendix 2. Forest Specific Trends from Breeding Bird Survey (BBS) and Integrated Monitoring in Bird Conservation (IMBCR) data.

An important purpose of this report is to evaluate bird biodiversity at the regional scale. Projects and plans are created and implemented on the forest scale, however, so the following is provided for individual forest comparisons to the region overall. Where forest trends deviate from the regional observations, an investigation of causal factors may be considered.

Notes on Breeding Bird Survey and IMBCR Data

Bird biodiversity was determined with the mean number of species detected each year from routes overlapping USFS lands. Lack of a datapoint on a given year indicates that no sampling was completed, and no associated standard error indicates that the estimate is from one route only. The location of each BBS route within each state can be identified at:

<https://databasin.org/datasets/02fe0ebbb1b04111b0ba1579b89b7420/>

and species counts can be determined at:

<https://databasin.org/datasets/02fe0ebbb1b04111b0ba1579b89b7420/>

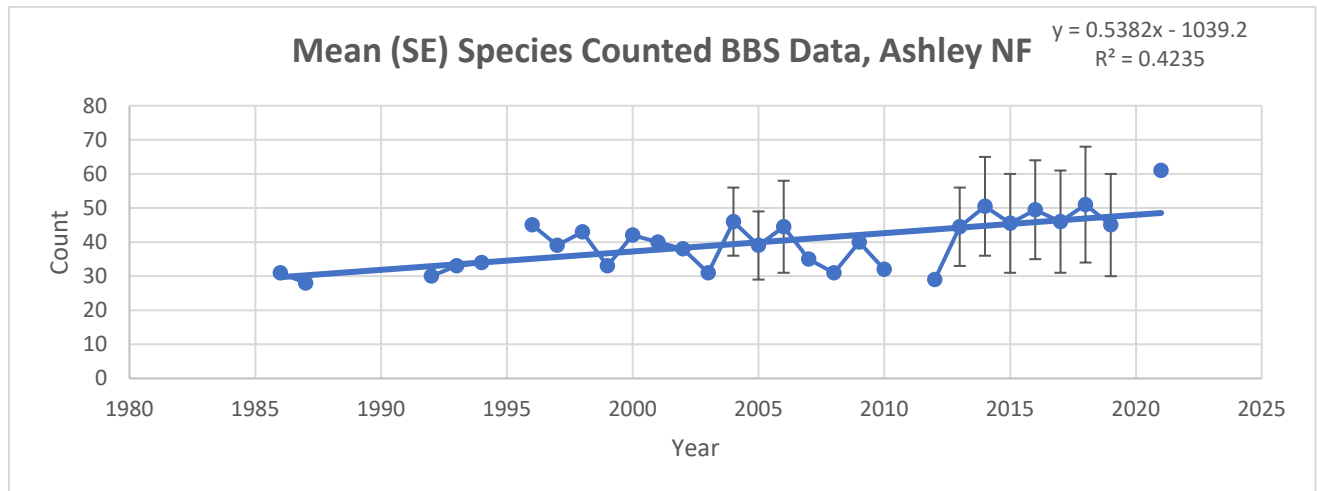
On-line map tools were accessed in December 2022, and data were used to create graphs displaying empirical trends.

Data collection began in 2008 using IMBCR methods, stratified by National Forest unit, but collection was intermittent and incomplete until 2017 when all forests in the region were sampled. For IMBCR, survey effort was stratified-random on the landscape, allowing for elevation changes and within land-management agency boundaries vs. road-based surveys from BBS. Also, the IMBCR data is likely more precise and allows for a yearly trend estimate because it uses far more survey transects per forest (range = 9-30, mean = 14) vs BBS survey routes (range = 0-8, mean = 4). Trends are calculated from 2017 to current and biodiversity is measured as the count of the number of species stable or trending upward or downward during the sampling period. The expectation is for populations to be normally distributed around 1.0, with some species declining and some increasing, but stable overall; skewing, especially < 1.0, may indicate a concern or ecological conditions.

ASHLEY NATIONAL FOREST

BBS Data

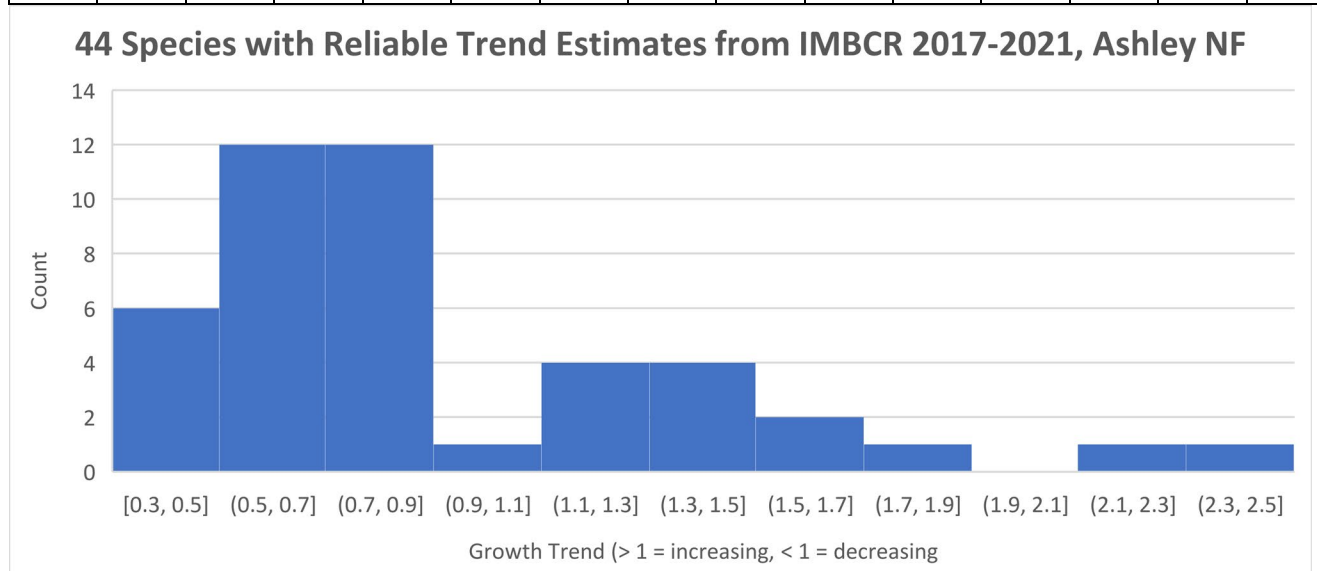
<u>Ashley BBS Routes</u>	<u>First Year</u>	<u>Years sampled</u>	<u>Last year</u>
Moon Lake	2004	11	2021
Grizzly Ridge	1986	28	2019



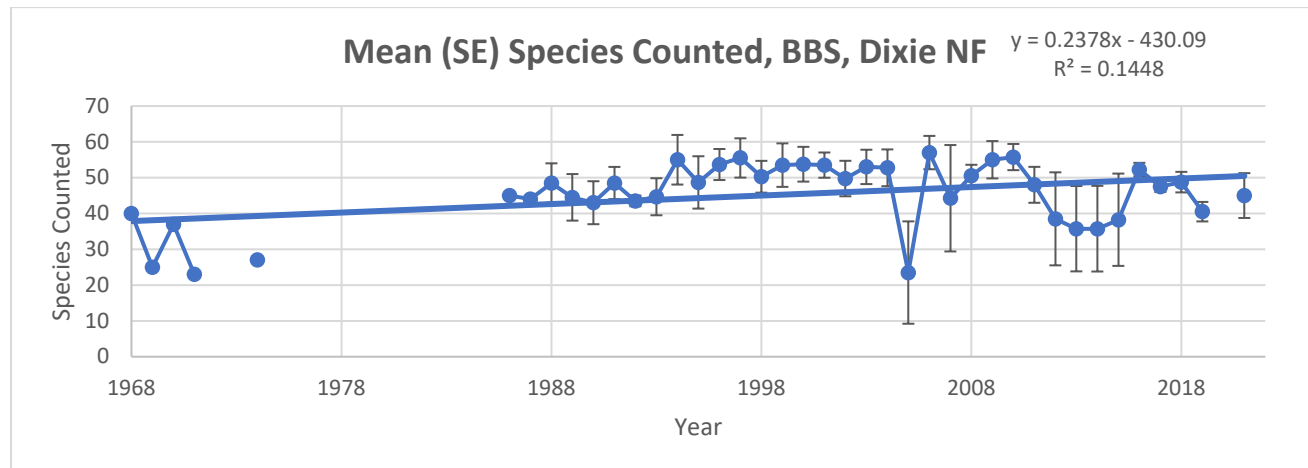
IMBCR Data

Number of 1-km² IMBCR Transects Sampled per Year, Ashley NF

2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
0	0	0	0	0	2	2	2	2	19	22	10	10	10	10

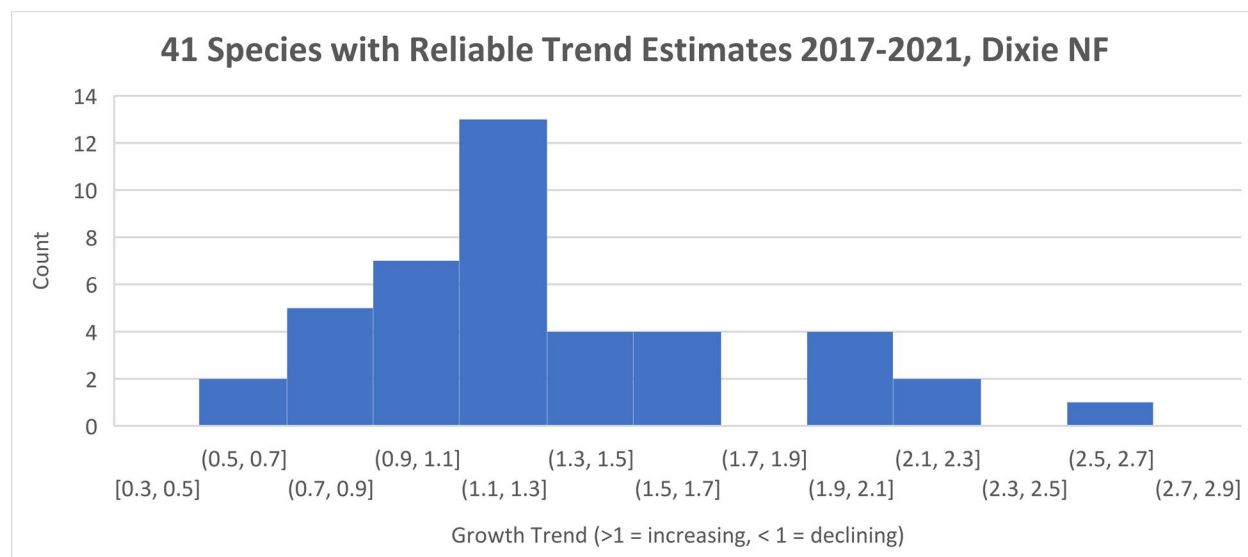


DIXIE NATIONAL FOREST



BBS Data

Route	First Year	Years sampled	Last year
Newcastle	1997	20	2021
Navajo Lake	1968	38	2019
Alton	2021	1	2021
Dixie NF	1993	26	2021
Main Canyon	1987	34	2021

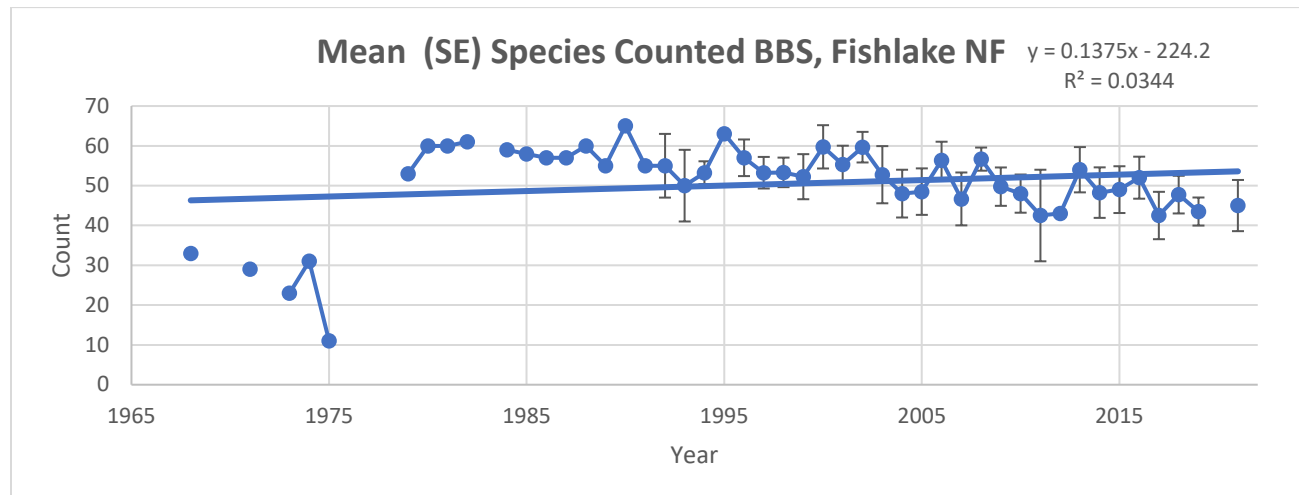


IMBCR Data

Number of 1-km2 IMBCR Transects Sampled per Year, Dixie NF

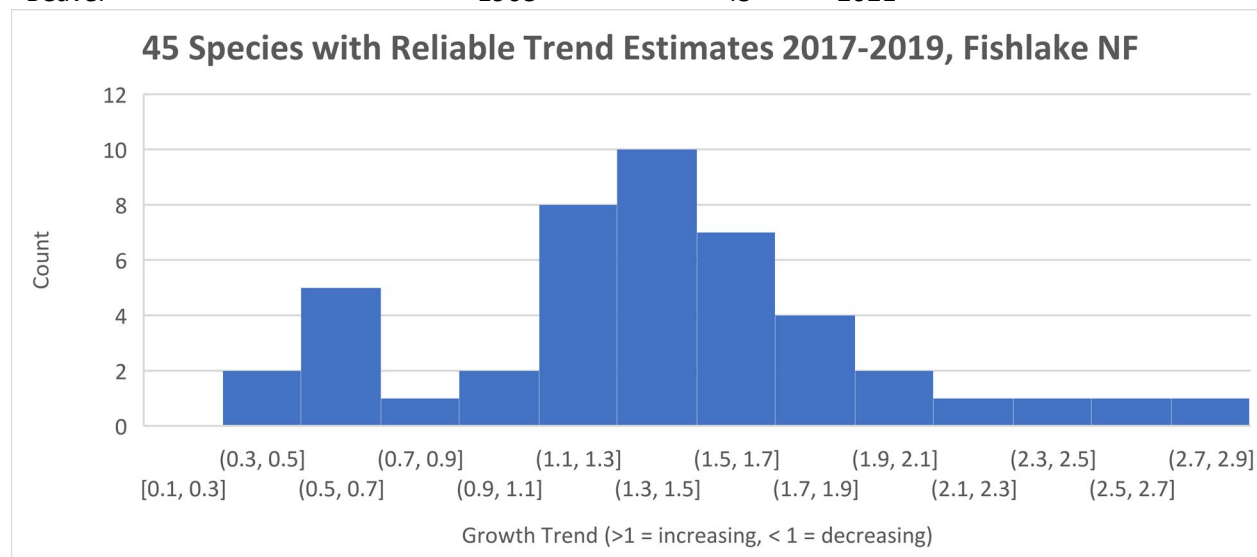
2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
0	0	0	0	0	0	0	0	0	10	10	10	10	14	10

FISHLAKE NATIONAL FOREST



BBS Data

<u>Route</u>	<u>First Year</u>	<u>Years Sampled</u>	<u>Last Year</u>
Gooseberry	1994	23	2021
Richfield	1994	21	2019
Fishlake NF	1992	23	2021
Beaver	1968	45	2021



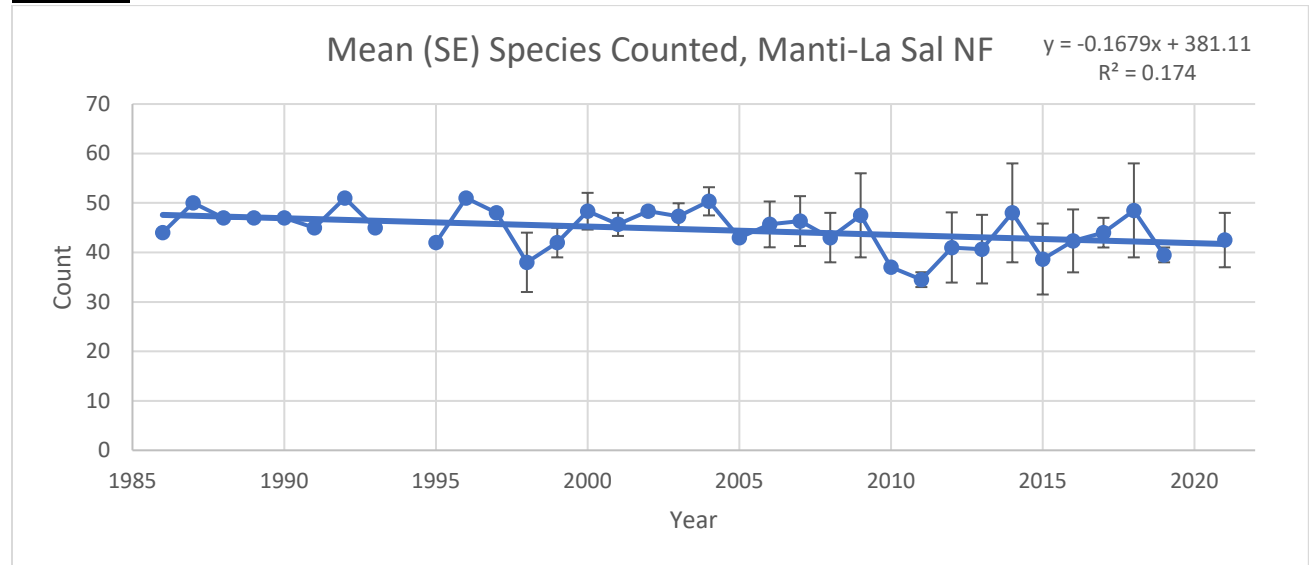
IMBCR Data

Number of 1-km² Transects Sampled per Year, Fishlake NF

2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
0	0	0	0	0	0	0	0	0	10	10	10	10	10	10

MANTI-LA SAL NATIONAL FOREST

BBS Data

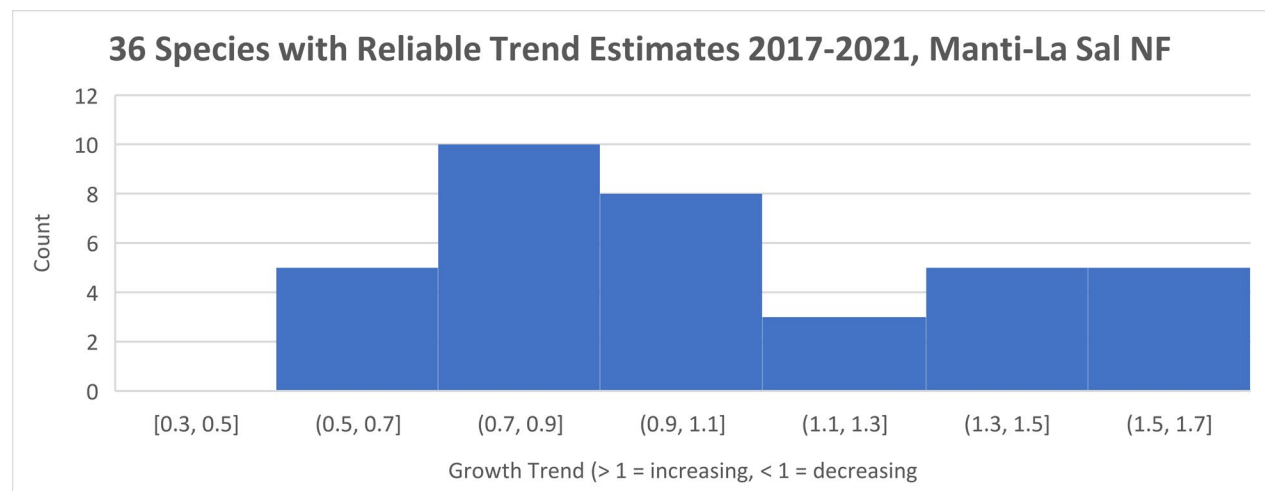


Manti-La Sal Routes	First Year	Years sampled	Last year
Skyline Drive	1986	25	2016
Ferron	2000	18	2021
La Sal	1998	23	2021

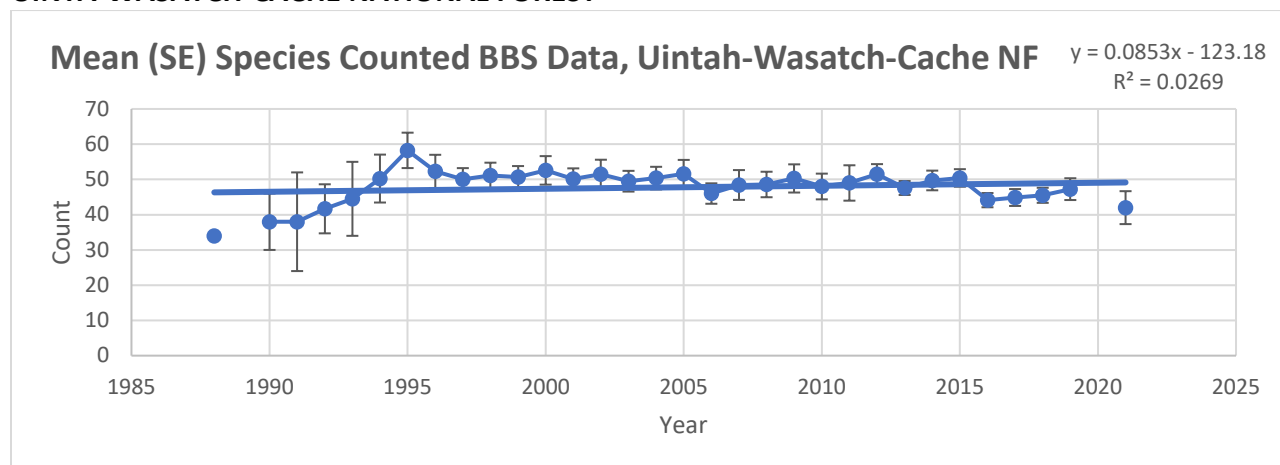
IMBCR Data

Number of 1-km² Transects Sampled per Year, Manti-La Sal NF

2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
1	2	3	2	2	2	6	47	50	30	30	12	14	14	14



UINTA-WASATCH-CACHE NATIONAL FOREST



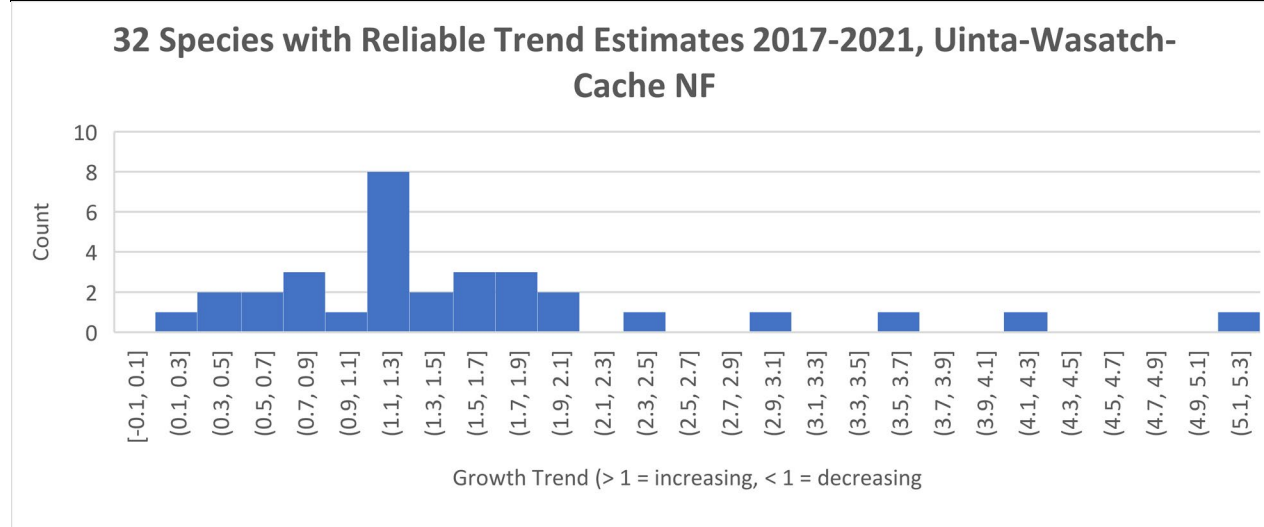
BBS Data

UWC Routes	First Year	Years sampled	Last year
Beck	1990	29	2018
Wasatch NF	1988	20	2021
Heber Mt	1994	25	2018
Soapstone	1992	24	2019
Lost Cr Res	1995	22	2018
Ant Flat Ogden Canyon	1994	21	2021
Red Spur Mt	1997	23	2021
Hardware Ranch	1994	25	2018

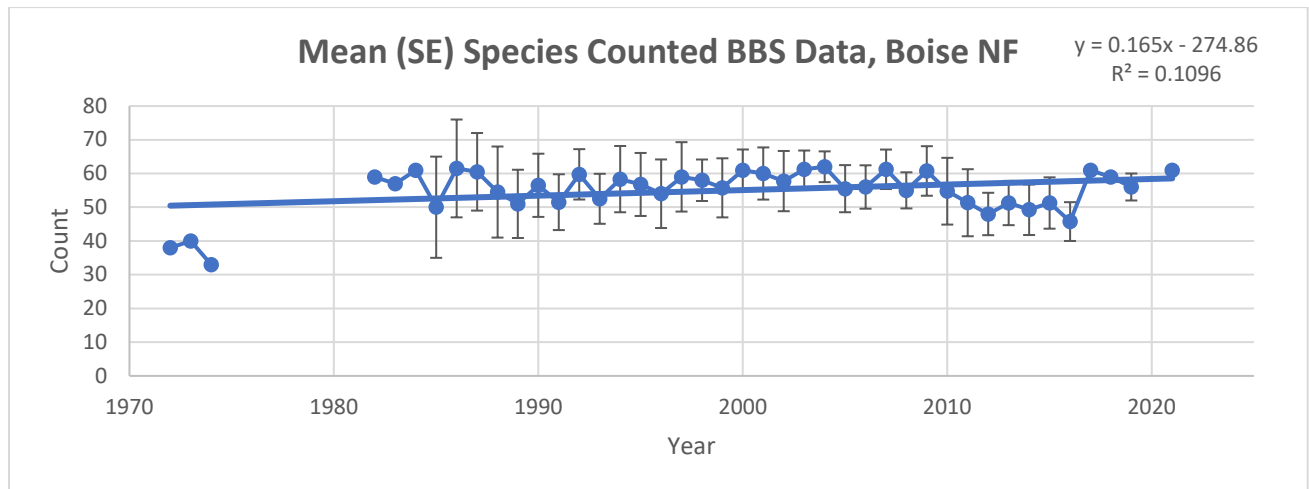
IMBCR Data

Number of 1-km² Transects Sampled per Year, Uinta-Wasatch-Cache NF

2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
1	2	2	0	0	4	4	4	4	15	15	15	15	22	15



BOISE NATIONAL FOREST



BBS Data

Boise Routes	First Year	Years sampled	Last year
Cabarton	1985	32	2019
Yellow Pine	1989	28	2016
Centerville	1972	38	2019
Featherville	1989	29	2021

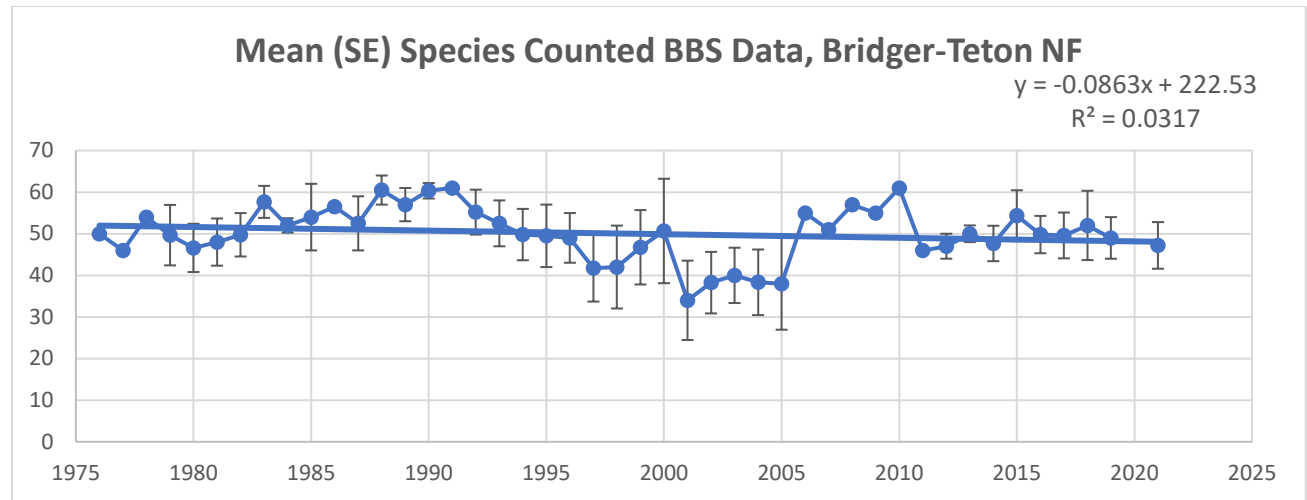
IMBCR Data

Number of 1-km² Transects Sampled per Year, Boise NF

2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
0	0	0	0	0	0	3	4	4	10	10	10	10	10	12



BRIDGER-TETON NATIONAL FOREST



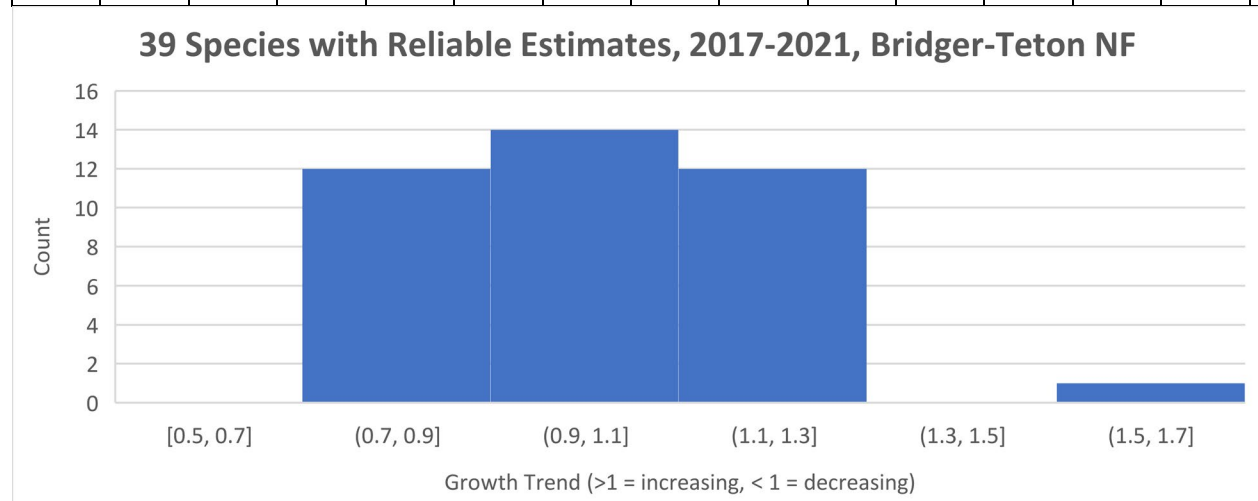
BBS Data

B-T Routes	First year	Years Sampled	Last Year
Buckskin MTN	1980	21	2021
Soda Lake	1980	23	2021
Alpine	1979	30	2021
Wilson	1979	24	2021
Moose	1976	36	2021

IMBCR Data

Number of 1-km² Transects Sampled per Year, Bridger-Teton NF

2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
0	0	9	9	20	20	20	20	20	20	20	10	10	11	9



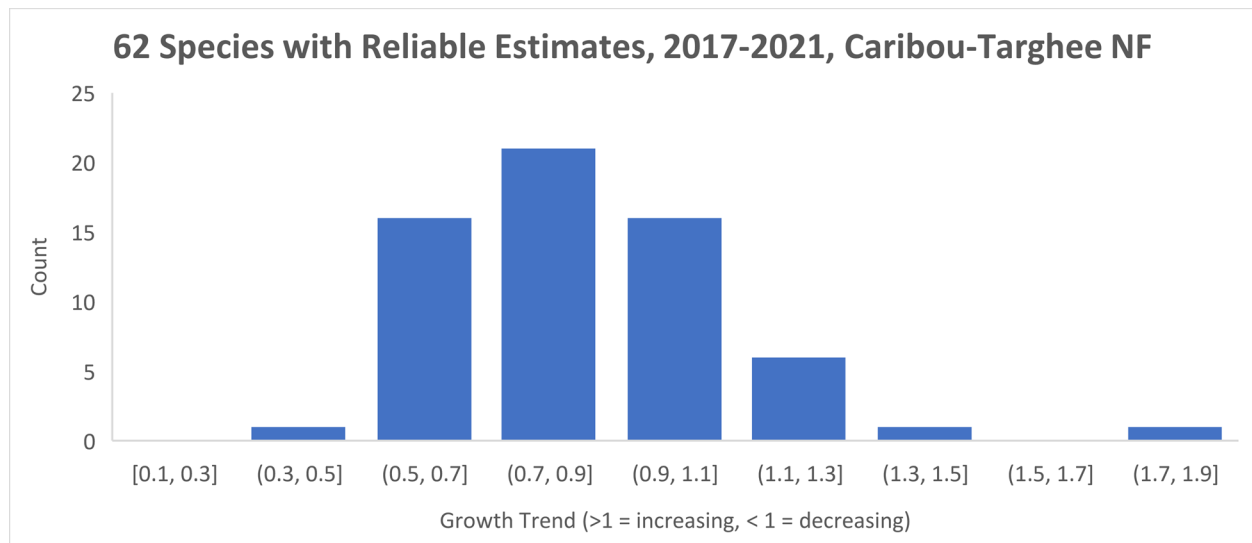
CARIBOU-TARGHEE NATIONAL FOREST
BBS Data

No BBS Survey routes on the Caribou-Targhee

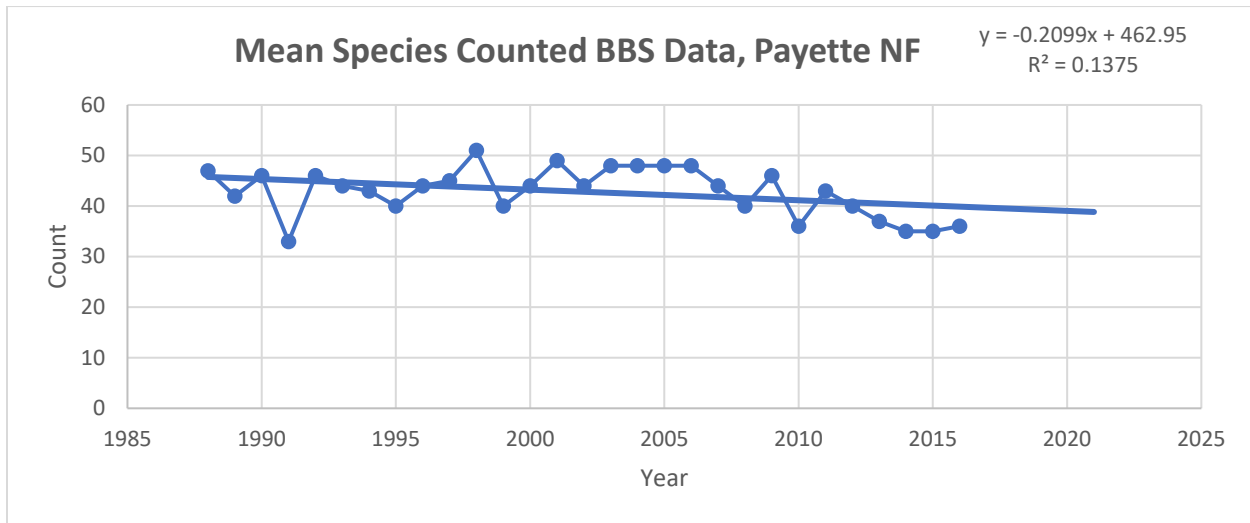
IMBCR Data

Number of 1-km² Transects Sampled per Year, Caribou-Targhee NF

2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
0	2	2	0	0	34	32	28	27	19	20	13	13	15	13



PAYETTE NATIONAL FOREST

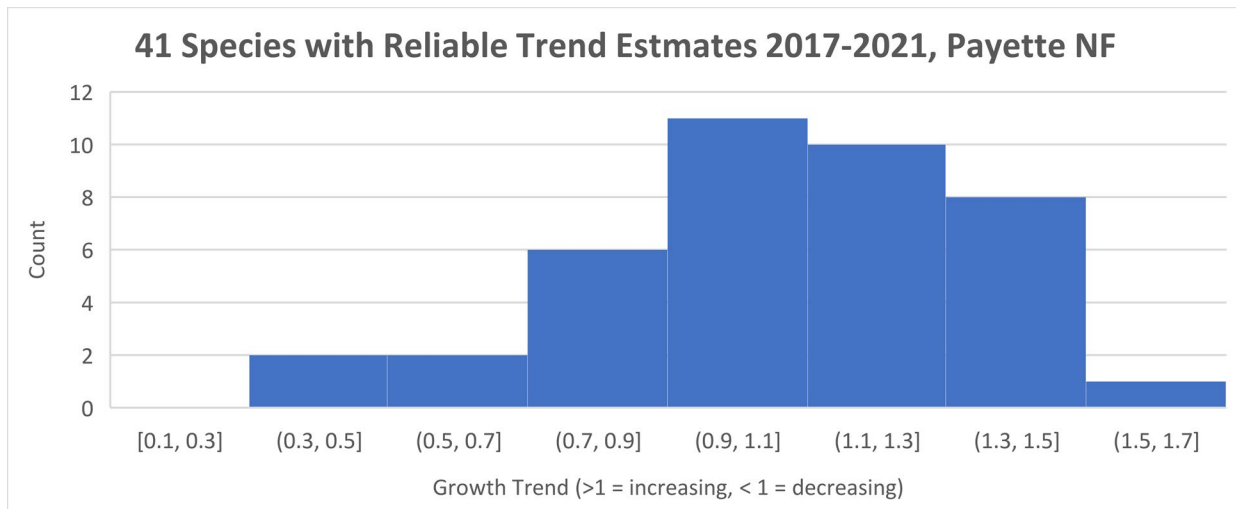


BBS Data

IMBCR Data

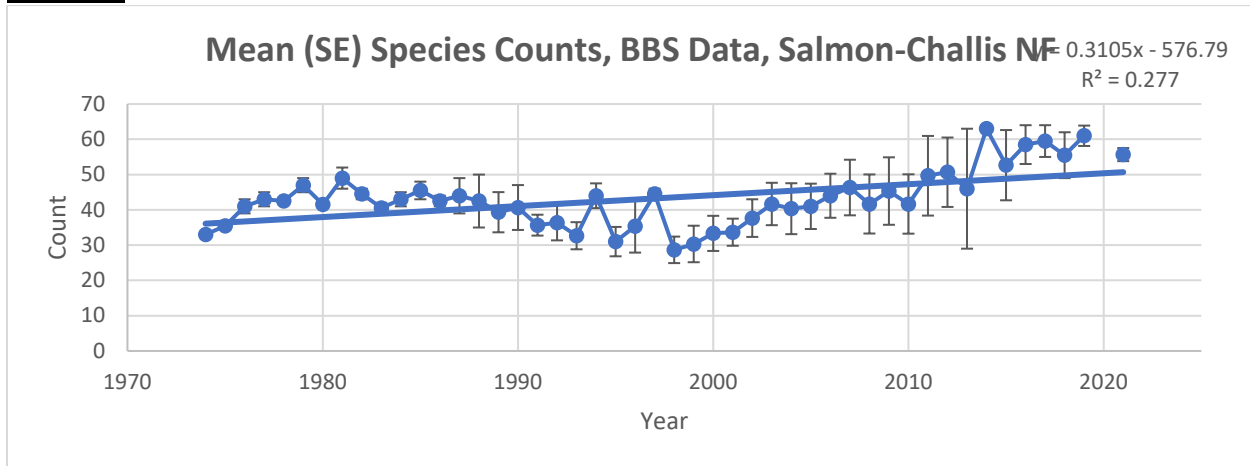
Number of 1-km² Transects Sampled per Year, Payette NF

2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
0	0	0	0	0	0	3	4	4	10	10	10	10	10	10



SALMON-CHALLIS NATIONAL FOREST

BBS Data

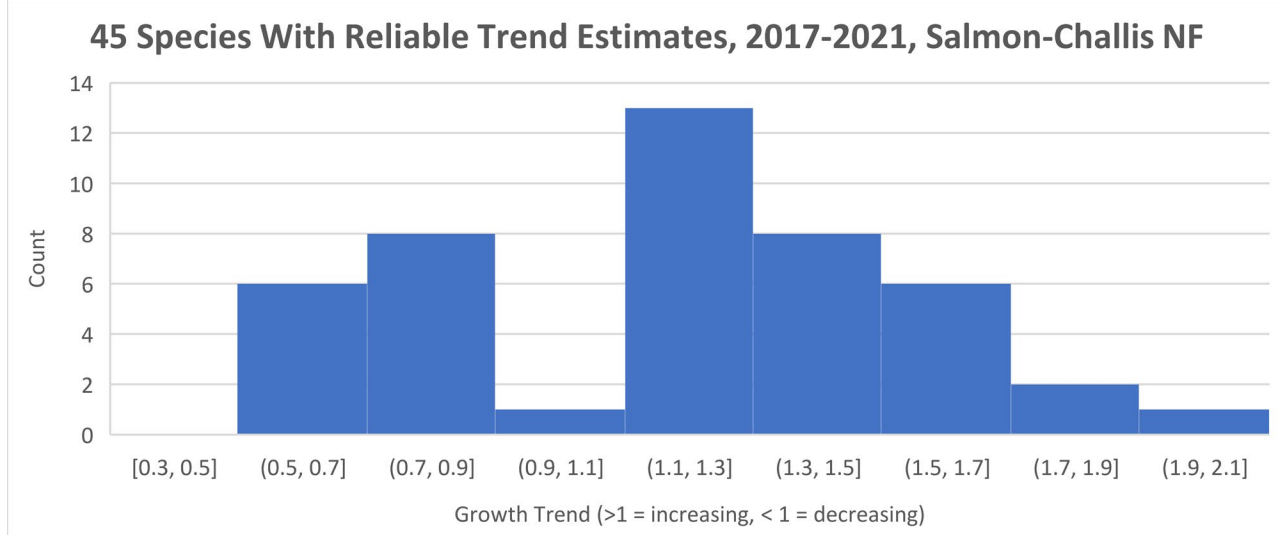


Salmon Challis Routes	First Year	Years sampled	Last year
Sawtooth City	2015	6	2021
Cobalt	1989	25	2015
Challis	1975	40	2021
Leadore	1974	47	2021

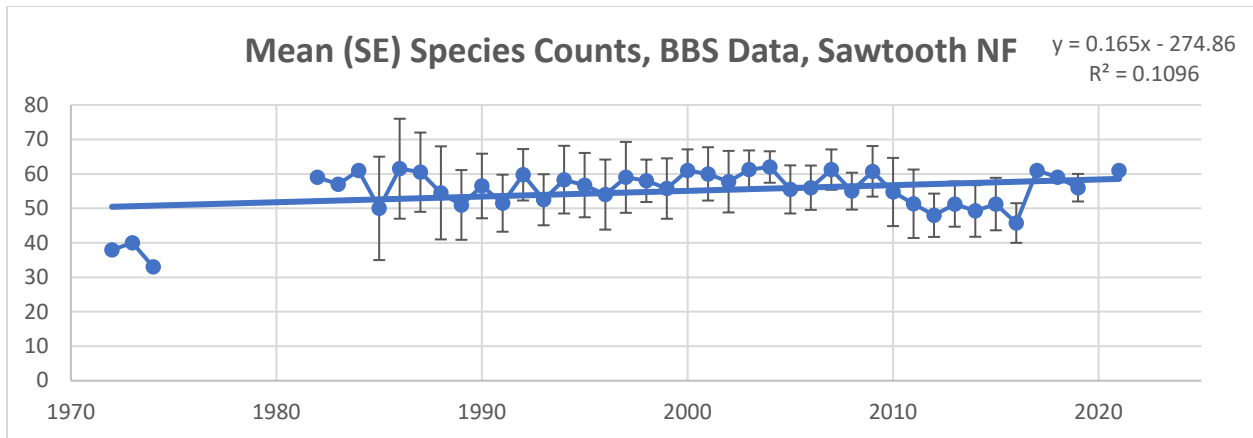
IMBCR Data

Number of 1-km² Transects Sampled per Year, Salmon-Challis NF

2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
0	0	0	0	0	0	3	3	3	15	15	10	11	11	11



SAWTOOTH NATIONAL FOREST



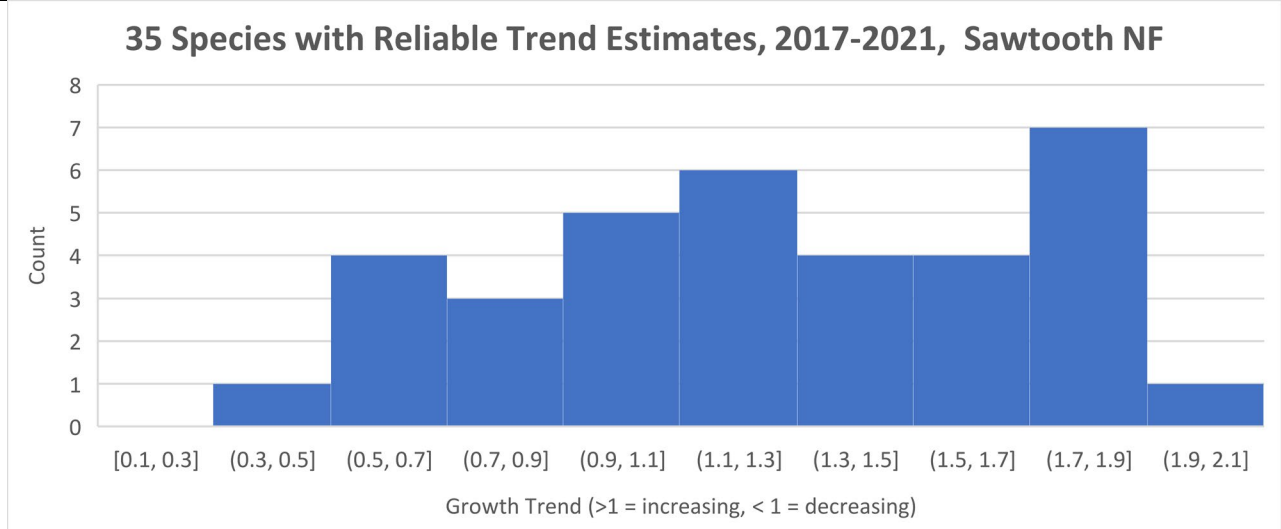
BBS Data

Sawtooth Routes	First Year	Years sampled	Last year
Cabarton	1985	32	2019
Yellow Pine	1989	28	2016
Centerville	1972	38	2019
Featherville	1989	29	2021

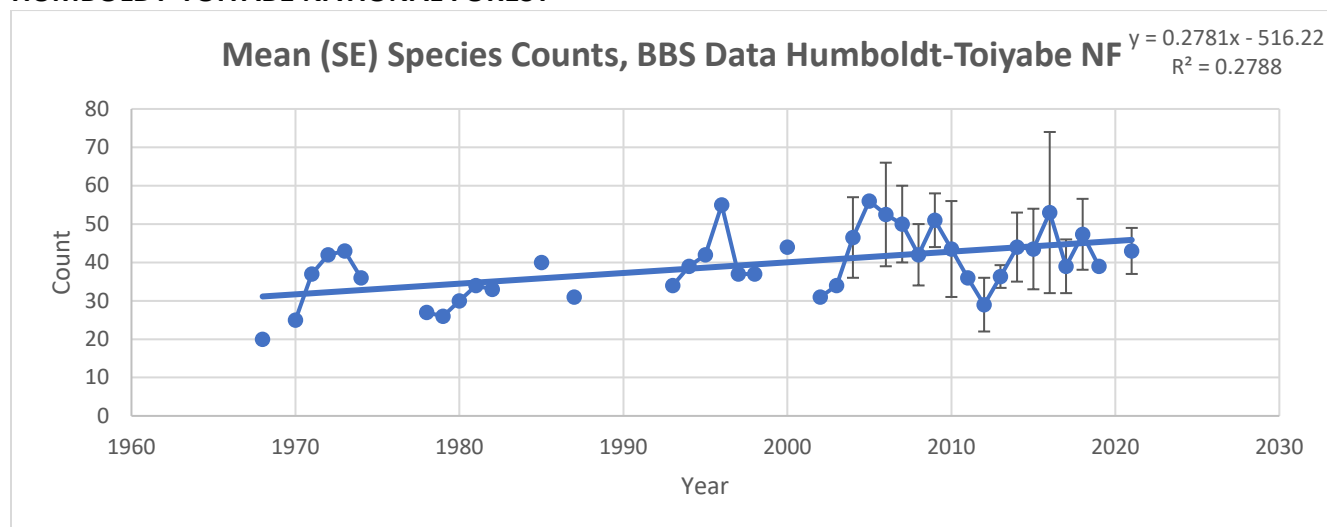
IMBCR Data

Number of 1-km² Transects Sampled per Year, Sawtooth NF

2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
0	0	0	0	0	0	3	4	4	10	10	10	12	16	12



HUMBOLDT-TOIYABE NATIONAL FOREST



BBS Data

Humboldt-Toiyabe Routes	First Year	Years sampled	Last year
Gardnerville	2013	4	2018
Dobbin Creek	1968	36	2018
Ruby Valley	2004	14	2021
Humboldt NF	2021	1	2021

IMBCR Data

Number of 1-km² Transects Sampled per Year, Humboldt-Toiyabe NF

2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
0	0	0	0	0	0	0	0	0	29	30	15	19	21	21

