Red-legged Kittiwake

Rissa brevirostris

Class: Aves
Order: Charadriiformes

Review Status: Peer-reviewed **Version Date:** 11 February 2019

Conservation Status

NatureServe:	*Agency:*		
G Rank: G3	ADF&G: Species of Greatest Conservation Need	IUCN: Vulnerable	Audubon AK: Red
S Rank: S2S3B,S2	USFWS: Bird of Conservation Concern	BLM:	

Final Rank

Conservation category: **VII. Yellow**

low status and either high biological vulnerability or high action need

Category	Range	Score
Status	-20 to 20	-3
Biological	-50 to 50	4
Action	-40 to 40	-4

Higher numerical scores denote greater concern

Status - variables measure the trend in a taxon's population status or distribution. Higher status scores denote taxa with known declining trends. Status scores range from -20 (increasing) to 20 (decreasing). **Score**

Population Trend in Alaska (-10 to 10) 2

The colony on St. George Island, which is home to >80% of the world's breeding population, experienced severe declines in the 1970s and 1980s, but has recovered since then (Byrd et al. 1997a; Kildaw 1998; Denlinger 2006; Kitaysky et al. 2006). Recent data indicate stable or increasing trends for most colonies in Alaska (Goyert et al. 2017; Dragoo et al. 2019 and previous reports). Although outside the scope of this question, it is important to note that there are no data for colonies in Russia. The Bering Island colony off the coast of Kamchatka is the largest colony outside of the Pribilof Islands and is the western-most breeding colony for this species.

Distribution Trend in Alaska (-10 to 10) -5

Stable. Historical colonies recorded in the 1970s are still active today. In the late 1990s, three small, new colonies were formed on the Aleutian Islands (Byrd et al. 2005; Denlinger 2006). These colonies are still active, but are occupied by very few individuals (Robinson et al. 2019). In 2018, scientists observed ~200 red-legged kittiwakes on St. Matthew Island and documented courtship and breeding behaviors (Robinson et al. 2019). Breeding on St. Matthew Island would represent a northward expansion of this species' breeding range by ~400 km (Robinson et al. 2019). Alternatively, this northward shift could be a response to changing ocean conditions, with breeding habitat elsewhere in Alaska becoming less suitable.

Status Total: -3

Biological - variables measure aspects of a taxon's distribution, abundance and life history. Higher biological scores suggest greater vulnerability to extirpation. Biological scores range from -50 (least vulnerable) to 50 (most vulnerable). **Score**

Population Size in Alaska (-10 to 10) -10

>25,000. Population size in Alaska is estimated at ~245,000 individuals (Goyert et al. 2017; Robinson et al. 2019).

Range Size in Alaska (-10 to 10) 4

Forages over open water and nests on the Pribilof Islands, a few Aleutian Islands, and probably on St. Matthew Island (Byrd and Williams 1993a; Byrd et al. 2005; Robinson et al. 2019). Estimated range size during breeding is <10,000 sq. km. Winters on open water across most of the Bering Sea and parts of the North Pacific Ocean from St. Lawrence Island south to Japan (Orben et al. 2018).

Population Concentration in Alaska (-10 to 10) 2

>15 sites. More than 80% of the global population breeds on a single island, St. George (Kildaw 1998). Nearly the entire population breeds on four islands, one of which is in Russia (reviewed in Robinson et al. 2019).

Reproductive Potential in Alaska

Age of First Reproduction (-5 to 5) 1

Unknown, but likely 4 years (Kitaysky et al. 2006). The closely related Black-legged Kittiwake first breeds between 3 to 5 years old (Hatch et al. 2009).

Number of Young (-5 to 5) 5

Produces a single, one-egg clutch per year (Byrd and Williams 1993a; Guitart et al. 2018). However, 2017 marked the fourth consecutive year where red-legged kittiwakes experienced nearly complete nesting failure on St. George Island (Guitart et al. 2018). Given the importance of this colony to the state and global population, we rank this question as A- <1 offspring/year.

Ecological Specialization in Alaska

Dietary (-5 to 5) 1

Piscivorous surface feeder. Red-legged kittiwakes have a specialized diet that consists primarily (>60%) of myctophid fish and young pollock (Byrd and Williams 1993a; Springer et al. 1996; Iverson et al. 2007; Sinclair et al. 2008; Kokubun et al. 2015; Orben et al. 2015a; Yamamoto et al. 2016). To a lesser extent, they consume sandlance and small invertebrates such as euphausiids, squids, and amphipods (Byrd and Williams 1993a; Springer et al. 1996; Sinclair et al. 2008; Kokubun et al. 2015).

Habitat (-5 to 5) 1

Forages and overwinters over open water (Byrd and Williams 1993a). Typically prefers deep water but distribution shifts to shallower waters during fall and winter (Hunt et al. 2014; Kokubun et al. 2015; Orben et al. 2015a; Orben et al. 2018). Sea ice does not limit winter distribution (Orben et al. 2015a; Orben et al. 2018). During breeding, nests on ledges of tall cliffs by the coast and on remote oceanic islands (Byrd and Williams 1993a). Nesting habitat is not thought to be limiting (Byrd et al. 2005).

Biological Total: 4

Action - variables measure current state of knowledge or extent of conservation efforts directed toward a given taxon. Higher action scores denote greater information needs due of lack of knowledge or conservation action. Action scores range from -40 (lower needs) to 40 (greater needs). **Score**

Management Plans and Regulations in Alaska (-10 to 10) -10

Protected under the Migratory Bird Treaty (MBTA 1918). Open to subsistence harvest, but subject to

regulations (AMBCC 2018).

Knowledge of Distribution and Habitat in Alaska (-10 to 10) 2

Distribution of colonies is well-documented and available through the North Pacific Seabird Data Portal (USFWS 2013d), with knowledge of habitat associations (Squibb and Hunt 1983; Kildaw 1998; Byrd et al. 2005). Some information of at-sea habitat and distribution from shipboard surveys (Jahncke et al. 2008; Hunt et al. 2014; Piatt and Drew 2015) and telemetry data (Kokubun et al. 2015; Yamamoto et al. 2016). Comparatively little is known about non-breeding distribution and habitat requirements (but see Orben et al. 2015a; Orben et al. 2018 for Pribilof Island colonies). The winter distribution of red-legged kittiwakes breeding on the Aleutian Islands is the subject of active research (M. Romano, USFWS, pers. comm.).

Knowledge of Population Trends in Alaska (-10 to 10) 2

The monitoring that is in place is only sufficient to detect large changes in population and only at a few colonies. Monitored on St. George and St. Paul, though sample size for the latter colony is very small (Guitart et al. 2018; Mong et al. 2019; M. Romano, USFWS, pers. comm.). Previously monitored on Buldir Island, but monitoring has been suspended following a rockfall (M. Romano, USFWS, pers. comm.). Current trend estimates are derived from count data, which represent attendance at long-term monitoring plots rather than actual population size.

Knowledge of Factors Limiting Populations in Alaska (-10 to 10) 2

Changes in population growth rates and reproductive parameters have been correlated with climate variables, but the ultimate mechanisms influencing population dynamics are thought to be prey availability and prey quality (Hunt et al. 1996; Byrd et al. 2008b; Sinclair et al. 2008; Sydeman et al. 2017a; Goyert et al. 2018; Will et al. 2018). Studies have linked productivity and chick development to food availability and quality (Kitaysky et al. 2006; Zador et al. 2013); however, data to test this hypothesis remain quite limited. Similarly, data on the non-breeding season are scarce, yet winter mortality and pre-breeding body condition are likely important components of population dynamics (Goyert et al. 2018; Will et al. 2018). Additional data are also needed to elucidate the roles of competition (Zador et al. 2013; Paredes et al. 2014; Yamamoto et al. 2016; Sydeman et al. 2017a) and nest site availability.

Action Total: -4

Supplemental Information - variables do not receive numerical scores. Instead, they are used to sort taxa to answer specific biological or management questions.

Harvest:	Unknown
Seasonal Occurrence:	Year-round
Taxonomic Significance:	Monotypic species
% Global Range in Alaska:	>10%
% Global Population in Alaska:	≥75%
Peripheral:	No

References

Byrd, G. V., and J. C. Williams. 1993a. Red-legged Kittiwake (Rissa brevirostris), version 2.0. In Poole, A. F., and F. B. Gill, eds. The Birds of North America. Cornell Lab of Ornithology, Ithaca, NY, USA. DOI: 10.2173/bna.60

Byrd, G. V., J. C. Williams, Y. B. Artukhin, and P. S. Vyatkin. 1997a. Trends in populations of red-legged kittiwake Rissa brevirostris, a Bering Sea endemic. Bird Conservation International 7(2):167–180. DOI: 10.1017/S0959270900001489

Byrd, G. V., H. M. Renner, and M. Renner. 2005. Distribution patterns and population trends of breeding seabirds in the Aleutian Islands. Fisheries Oceanography 14(S1):139–159. DOI: 10.1111/j.1365-2419.2005.00368.x

Byrd, G. V., W. J. Sydeman, H. M. Renner, and S. Minobe. 2008b. Responses of piscivorous seabirds at the Pribilof Islands to ocean climate. Deep-Sea Research II 55(16–17):1856–1867. DOI: 10.1016/j.dsr2.2008.04.015

Denlinger, L. M., comp. 2006. Alaska Seabird Information Series. Unpublished report, U.S Fish and Wildlife Service, Migratory Bird Management, Anchorage, AK, USA.

Dragoo, D. E., H. M. Renner, and R. S. A. Kaler. 2019. Breeding status and population trends of seabirds in Alaska, 2018. AMNWR 2019/03, U.S. Fish and Wildlife Service, Homer, AK, USA.

Drew, G. S., and J. F. Piatt. 2015. North Pacific Pelagic Seabird Database (NPPSD): U.S. Geological Survey data release (ver. 3.0, February, 2020). DOI: 10.5066/F7WQ01T3

Goyert, H. F., E. O. Garton, B. A. Drummond, and H. M. Renner. 2017. Density dependence and changes in the carrying capacity of Alaskan seabird populations. Biological Conservation 209:178–187. DOI: 10.1016/j.biocon.2017.02.011

Goyert, H. F., E. O. Garton, and A. J. Poe. 2018. Effects of climate change and environmental variability on the carrying capacity of Alaskan seabird populations. The Auk 135(4):975–991. DOI: 10.1642/AUK-18-37.1

Guitart, S. R., S. B. Carvey, L. M. White, and M. D. Romano. 2018. Biological monitoring at St. George Island, Alaska in 2018. Report AMNWR 2018/14, U.S. Fish and Wildlife Service, Homer, AK, USA.

Hatch, S. A., G. J. Robertson, and P. H. Baird. 2009. Black-legged Kittiwake (Rissa tridactyla), version 2.0. In Poole, A. F., ed. The Birds of North America. Cornell Lab of Ornithology, Ithaca, NY, USA. DOI: 10.2173/bna.92

Hunt, G. L., M. B. Decker, and A. Kitaysky. 1996. Fluctuations in the Bering Sea ecosystem as reflected in the reproductive ecology and diets of kittiwakes on the Pribilof Islands, 1975 to 1991. Pages 142–153 in S. P. R. Greenstreet and M. L. Tasker, eds. Aquatic Predators and their Prey. Fishing News Books, Cambridge, MA, USA. Available online: https://escholarship.org/uc/item/0fw3109n

Hunt, G. L., M. Renner, and K. Kuletz. 2014. Seasonal variation in the cross-shelf distribution of seabirds in the southeastern Bering Sea. Deep Sea Research Part II: Topical Studies in Oceanography 109:266–281. DOI: 10.1016/j.dsr2.2013.08.011

Iverson, S. J., A. M. Springer, and A. S. Kitaysky. 2007. Seabirds as indicators of food web structure and ecosystem variability: Qualitative and quantitative diet analyses using fatty acids. Marine Ecology Progress Series 352:235–244. DOI: 10.3354/meps07073

Jahncke, J., L. S. Vlietstra, M. B. Decker, and G. L. Hunt. 2008. Marine bird abundance around the Pribilof Islands: A multi-year comparison. Deep Sea Research Part II: Topical Studies in Oceanography 55(16–17):1809–1826. DOI: 10.1016/j.dsr2.2008.04.003

Kildaw, S. D. 1998. Population status and patterns of distribution and productivity of kittiwakes on St. George Island, Alaska. PhD thesis, University of Alaska Fairbanks, AK, USA.

Kitaysky, A. S., E. V. Kitaiskaia, J. F. Piatt, and J. C. Wingfield. 2006. A mechanistic link between chick diet and decline in seabirds? Proceedings of the Royal Society B: Biological Sciences 273(1585):445–450. DOI: 10.1098/rspb.2005.3351

Kokubun, N., T. Yamamoto, D. M. Kikuchi, A. Kitaysky, and A. Takahashi. 2015. Nocturnal foraging by red-legged kittiwakes, a surface feeding seabird that relies on deep water prey during reproduction. PLoS ONE 10(10):e0138850. DOI: 10.1371/journal.pone.0138850

Migratory Bird Treaty Act (MBTA). 1918. U.S. Code Title 16 §§ 703-712 Migratory Bird Treaty Act.

Mong, R. N., S. A. Tanedo, and M. D. Romano. 2019. Biological monitoring at St. Paul Island, Alaska in 2018. AMNWR 2019/01, U.S. Fish and Wildlife Service, Homer, AK, USA.

Naves, L. C. 2018. Geographic and seasonal patterns of seabird subsistence harvest in Alaska. Polar Biology 41(6):1217–1236. DOI: 10.1007/s00300-018-2279-4

Orben, R. A., D. B. Irons, R. Paredes, D. D. Roby, R. A. Phillips, and S. A. Shaffer. 2015a. North or south? Niche separation of endemic red-legged kittiwakes and sympatric black-legged kittiwakes during their non-breeding migrations. Journal of Biogeography 42(2):401–412. DOI: 10.1111/jbi.12425

Orben, R., N. Kokubun, A. Fleishman, A. Will, T. Yamamoto, S. Shaffer, R. Paredes, A. Takahashi, and A. Kitaysky. 2018.

Persistent annual migration patterns of a specialist seabird. Marine Ecology Progress Series 593:231–245. DOI: 10.3354/meps12459

Paredes, R., R. A. Orben, R. M. Suryan, D. B. Irons, D. D. Roby, A. M. A. Harding, R. C. Young, K. Benoit-Bird, C. Ladd, H. Renner, S. Heppell, R. A. Phillips, and A. Kitaysky. 2014. Foraging responses of black-legged kittiwakes to prolonged food-shortages around colonies on the Bering Sea shelf. PLoS ONE 9(3):e92520. DOI: 10.1371/journal.pone.0092520

Robinson, B. W., A. S. Johnson, I. J. Lovette, and M. D. Romano. 2019a. Potential northward expansion of the breeding range of red-legged kittiwake Rissa brevirostris. Marine Ornithology 47:229–234.

Sinclair, E. H., L. S. Vlietstra, D. S. Johnson, T. K. Zeppelin, G. V. Byrd, A. M. Springer, R. R. Ream, and G. L. Hunt. 2008. Patterns in prey use among fur seals and seabirds in the Pribilof Islands. Deep Sea Research Part II: Topical Studies in Oceanography 55(16–17):1897–1918. DOI: 10.1016/j.dsr2.2008.04.031

Springer, A. M., J. F. Piatt, and G. V. Vliet. 1996. Sea birds as proxies of marine habitats and food webs in the western Aleutian Arc. Fisheries Oceanography 5(1):45–55. DOI: 10.1111/j.1365-2419.1996.tb00016.x

Squibb, R. C., and G. L. Hunt. 1983. A comparsion of nesting-ledges used by seabirds on St. George Island. Ecology 64(4):727–734. DOI: 10.2307/1937195

Sydeman, W. J., S. A. Thompson, J. F. Piatt, M. García-Reyes, S. Zador, J. C. Williams, M. Romano, and H. M. Renner. 2017a. Regionalizing indicators for marine ecosystems: Bering Sea–Aleutian Island seabirds, climate, and competitors. Ecological Indicators 78:458–469. DOI: 10.1016/j.ecolind.2017.03.013

U.S. Fish and Wildlife Service (USFWS). 2013d. North Pacific Seabird Data Portal. Available online: axiom.seabirds.net/maps/north-pacific-seabirds/ Accessed 2019-10-29.

Will, A., E. Kitaiskaia, and A. Kitaysky. 2018. Red-legged kittiwake feathers link food availability to environmental changes in the Bering Sea. Marine Ecology Progress Series 593:261–274. DOI: 10.3354/meps12509

Yamamoto, T., N. Kokubun, D. M. Kikuchi, N. Sato, A. Takahashi, A. P. Will, A. S. Kitaysky, and Y. Watanuki. 2016. Differential responses of seabirds to environmental variability over 2 years in the continental shelf and oceanic habitats of southeastern Bering Sea. Biogeosciences 13(8):2405–2414. DOI: 10.5194/bg-13-2405-2016

Zador, S., G. Hunt, T. TenBrink, and K. Aydin. 2013. Combined seabird indices show lagged relationships between environmental conditions and breeding activity. Marine Ecology Progress Series 485:245–258. DOI: 10.3354/meps10336

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