California Department of Fish and Wildlife Wolf-Livestock Compensation Pilot Program DRAFT

Fiscal Year 2022/23

Wildlife and Fisheries Division
Wildlife Branch

Wolf-Livestock Compensation Pilot Program

I. FORWARD

The Department's Conservation Plan for Gray Wolves In California (Wolf Plan) proposed a future that would include a wolf compensation program for livestock producers impacted by wolf presence in California. The Budget Act of 2021 was the legislature's first authorization to fund the Department to implement a "wolf conflict compensation pilot program" and authorized the Department to "develop a grant process to allocate funds to pay for the deterrence of wolf presence near livestock, the impacts of wolf presence on livestock, and for verified loss of livestock for participating ranchers" occurring on or after September 23, 2021. To that end, the Department convened a diverse group of interested parties with diverse perspectives, experience, and expertise, to participate in a wolf stakeholder working group (Wolf SWG). The Wolf SWG aided the Department in gathering information from other programs, and provided input for development of an interim program.

This effort led the Department to implement the first two prongs of the Interim Wolf-Livestock Compensation Grants Program: direct loss compensation (prong 1) in February 2022; and deterrent method compensation (prong 2) in May 2022. In this final phase of program development, the Department is broadening the Wolf SWG to solicit input and establish a mechanism for compensation of indirect impacts on livestock due to wolf presence (prong 3). Each prong has its own legal and policy implications that the Department will continue to explore going forward.

II. PILOT PROGRAM OVERVIEW

Direct Loss Compensation (Prong 1)

Producers are eligible for compensation of direct loss of livestock (death, injury) due to suspected wolf depredation, as determined during a depredation investigation and documented in a CDFW Livestock Loss Determination Form. The following payment formula is used, based on fair market value (FMV) at the time of sale, as determined by the U.S. Department of Agriculture, unless another valuation method sets a different value:

- CURRENT: 100% of FMV for each head of livestock injured or killed due to confirmed and probable wolf depredation.
- PROPOSED: 100% of FMV for each head of livestock injured or killed due to confirmed, probable, and possible wolf depredation.

The Department classifies wolf depredation as "confirmed" when there is physical evidence that an animal was injured or killed by a wolf; "probable" when there is evidence to suggest wolf predation (e.g., telemetry data), but not enough evidence to confirm it; and "possible" when there is evidence indicating an animal was predated, and predation by a wolf cannot reasonably be excluded, in the investigator's best professional judgment.

The Department recognizes that producers may experience a higher ratio of total livestock losses (dead, missing) to confirmed kills, due to suspected wolf depredation.

- <u>PROPOSED: 3.5 (multiplier) x FMV</u> for each head of cow "*to help account for lost future productivity (i.e., future calf production) from that cow. If a P4P program is implemented, then this multiplier is negotiable.*"

Nonlethal Deterrent Methods (Prong 2)

Eligible producers will continue to be compensated for the use of a wide variety of nonlethal deterrent tools and actions. Producers may use known methods, as well as techniques that may be newer in understanding or use, to deter wolf presence near livestock. The following payment formula will be used, based on FMV at the time of purchase and/or other valid valuation method as appropriate: 100% of valuation method for each deterrent method used.

Pay For Presence (Prong 3)

The framework outlined in this draft concept is intended to meet the goals of the Department for straightforward implementation of this first-ever state program. The resulting program, from application to payment, will be designed with efficiency and simplicity as key tenets. In anticipation of implementation, the Department has continued planning internal administrative processes such that the three-prong pilot program 'roll out' can be completed in a timely manner. The following draft concept has been developed with consideration of the best available literature and various sources including the Wolf Plan, Part II, Appendix G (Phases 1-3 of Wolves in California, Planned/Potential Options Common to all 3 Phases of Plan), other programs, and proposals. Ultimately, the Department will fold recommendations into its internal decision-making to finalize adoption of the program.

III. PAY FOR PRESENCE FRAMEWORK

Known Wolf Territory

The Department will identify each known wolf pack territory and core area within the territory based on the best available data (e.g., satellite collar data, cameras, DNA) each calendar year. A pack territory can change over time due to many factors, such as wildfire. A kernel density estimator (KDE) will be used to calculate resident wolf pack territory and core area in California, similar to the federal Mexican Wolf Program. It is one of the most statistically efficient methods available for home range and probability density estimation.

- Pack territory: 95% KDE.
- Core area: 50% KDE of pack territory.

The Department will work closely with each applicant to determine if (1) a producer operates in a known pack territory; and (2) within the core area of that territory.

Eligible Producers

Producers raising livestock within the known territory of a resident wolf pack may apply for compensation. The program does not compensate producers for the

presence of a dispersing wolf outside of known pack territory, as they are known to travel widely, and their movements are unpredictable. The Department recognizes that there may be extenuating circumstances, whereby eligibility may be considered on a case-by-case basis.

Payment Formula

The Department recognizes that the impact of wolf presence on livestock in a known wolf territory may include indirect costs such as weight loss and/or reduced productivity. The following payment formula is proposed, based on FMV at the time of sale, unless another valuation method sets a different value.

- PROPOSED (INDIRECT LOSS): 3.5% of FMV for each head of calf, inside the core area of a wolf pack territory, that survive to time of annual sale.
- PROPOSED (INDIRECT LOSS): 3.0% of FMV for each head of cow, inside the core area of a wolf pack territory, that survive to time of annual sale.
- PROPOSED (INDIRECT LOSS): 2.0% of FMV for each head of cow and calf, outside of the core area, within a wolf pack territory, that survive to time of annual sale. Livestock operations further from the core area will generally experience less resident wolf activity.

To date, only cattle have been confirmed to be depredated by wolves in California. Other livestock, such as sheep, may be at risk of wolf depredation and/or other impacts due to wolf presence in the future. As more information becomes available, the pay for presence formula will be adjusted to include livestock other than cattle.

Application Period

Compensation is retroactive from September 23, 2021, and available annually during the pilot program until all funds are expended, or June 30, 2026, whichever comes sooner. The Department will accept applications year-round.

Application Package

The application form with the following supporting documentation will be considered as part of a complete application package:

- Location(s) of operation.
- Brief description of operation (e.g., pasture, grazing allotment).
- Dates livestock are at location.
- Type of livestock.
- Total head of livestock (at start of season, at time of sale).
- Proof of FMV or other valid valuation method.

The Department will submit approved application packages to the State Controller's Office for invoice processing on January 31st of each year.

Grant Agreement

Upon review of the application, producers will enter into a Depredation Prevention Agreement (i.e., application package) with the Department. The agreement will be based on each producers' unique circumstances, including livestock operation type,

---

==total head of livestock, and land use within a pack territory. One component of the agreement will be evaluation of a nonlethal deterrent strategy to mitigate future potential conflict. The deterrent tools and/or actions used as part of this strategy may also be eligible for prong 2 compensation. During this pilot, collected data will be analyzed closely in coordination with participating producers. The results will be used to inform adjustments to the payment formula as the program expands through this adaptive process.== Further, the Department recognizes that there is little or no data quantifying the effects of wolf presence near livestock in California. Additional research and analysis are required.

LITERATURE REVIEW

Agarwala, M., Kumar, S., Treves, A., & Naughton-Treves, L. 2010. Paying for wolves in Solapur, India and Wisconsin, USA: comparing compensation rules and practice to understand the goals and politics of wolf conservation. Biological Conservation, 143(12), 2945-2955.

Antonelli, S., K. Boysen, C. Piechowski, M. Smith, and G. Willard. 2016. An analysis of wolf-livestock conflict hotspots and conflict reduction strategies in northern California. Defenders of Wildlife and the Bren School of Environmental Science and Management.

Bautista, C., J. Naves, E. Revilla, et al. 2019. Large carnivore damage in Europe: Analysis of compensation and prevention programs. Biological Conservation 235: 308-316.

Bradley, E.H., and D.H. Pletscher. 2005. Assessing factors related to wolf depredation of cattle in fenced pastures in Montana and Idaho. Wildlife Society Bulletin 33:1256-1265.

Bruns, A., M. Waltert, and I Khorozyan. 2020. The effectiveness of livestock protection measures against wolves (*Canis lupus*) and implications for their co-existence with humans. Global Ecology and Conservation 21:e00868.

Davidson-Nelson S.J., and T.M. Gehring. 2010. Testing fladry as a nonlethal management tool for wolves and coyotes in Michigan. Human-Wildlife Interactions 4:87–94.

Dellinger, J.A., C.R. Shores, A. Craig, M.R. Heithaus, W.J. Ripple, and A.J. Wirsing. 2019. Habitat use of sympatric prey suggests divergent anti-predator responses to recolonizing gray wolves. Oecologia 189:487-500.

Dellinger, J.A., C.R. Shores, M. Marsh, M.R. Heithaus, W.J. Ripple, and A.J. Wirsing. 2018. Impacts of recolonizing gray wolves (*Canis lupus*) on survival and mortality in two sympatric ungulates. Canadian Journal of Zoology 96:760-768.

Eklund A., J.V. Lopez-Bao, M. Tourani, G. Chapron, and J. Frank. 2017. Limited evidence on the effectiveness of interventions to reduce livestock predation by large carnivores. Scientific Reports 7:2097.

Gehring, T.M., K.C. Vercauteren, M.L. Provost, A.C. Cellar. 2010. Utility of livestock-protection dogs for deterring wildlife from cattle farms. Wildlife Research 37:715-721.

Iliopoulos, Y., C. Astaras, Y. Lazarou, M. Petridou, S. Kazantzidis, and M. Waltert. 2019. Tools for co-existence: fladry corrals efficiently repel wild wolves (*Canis lupus*) from experimental baiting sites. Wildlife Research 46:484-498.

Kinka, D., J.T. Schultz, and J.K. Young. 2021. Wildlife responses to livestock guardian dogs and domestic sheep on open range. Global Ecology and Conservation 31:e01823.

Kinka, D., and J.K. Young. 2019. Evaluating domestic sheep survival with different breeds of livestock guardian dogs. Rangeland Ecology and Management 72:923-932.

Kovacs, K. E., K.E. Converse, M.C. Stopher, J.H. Hobbs, M.L. Sommer, P.J. Figura, D.A. Applebee, D.L. Clifford, and D.J. Michaels. Conservation Plan for Gray Wolves in California. 2016. California Department of Fish and Wildlife, Sacramento, CA 329 pp.

Lance, N.J., S.W. Breck, C. Sime, P. Callahan, and J.A. Shivik. 2010. Biological, technical, and social aspects of applying electrified fladry for livestock protection from wolves (*Canis lupus*). Wildlife Research 37:708-714.

Lehmkuhler, J., Palmquist, G., Ruid, D., and A. Wydeven. 2007. Effects of Wolves and Other Predators on Farms in Wisconsin: Beyond Verified Losses.

Macon, D., R. Baldwin, D. Lile, J. Stackhouse, C.K. Rivers, T. Saitone, T. Schohr, L. Snell, J. Harper, R. Ingram, K. Rodrigues, L. Macaulay, and L. Roche. 2018. Livestock protection tools for California ranchers. University of California Agriculture and Natural Resources Publication 8598.

Mech, L.D., E.K. Harper, T.J. Meier, and W.J. Paul. 2000. Assessing factors that may predispose Minnesota farms to wolf depredations on cattle. Wildlife Society Bulletin 28:623-629.

Miller J.R.B., K.J. Stoner, M.R. Cejtin, T.K. Meyer, A.D. Middleton, and O.J. Schmitz. 2016. Effectiveness of contemporary techniques for reducing livestock depredations by large carnivores. Wildlife Society Bulletin 40:806–815.

Montag, J. M. 2003. Compensation and predator conservation: limitations of compensation. Carnivore Damage Prevention News 6: 2-6. www2.nina.no/lcie_new/pdf/634991551700552895_CDPNews6.pdf

Morehouse, A.T., J. Tigner, and M.S. Boyce. 2018. Coexistence with large carnivores supported by a predator-compensation program. Environmental Management 61: 719-731.

Morrison, C. 2012. Carnivores and conflict: A community approach to carnivore compensation. Report 1: Summary of carnivore compensation programs. Waterton Biosphere Reserve Association Carnivore Working Group.

Morrison, C. 2013 Carnivores and conflict: A community approach to carnivore compensation. Report 1: Proposed amendments to Alberta Wildlife Predator Compensation Program. Waterton Biosphere Reserve Association Carnivore Working Group.

Muhly, T.B., M. Alexander, M.S. Boyce, R. Creasey, M. Hebblewhite, D. Paton, J.A. Pitt, and M. Musiani. 2010. Differential risk effects of wolves on wild versus domestic prey have consequences for conservation. Oikos 119: 1243-1254.

Musiani, M., C. Mamo, L. Boitani, C. Callaghan, C.C. Gates, L. Mattei, E. Visalberghi, S. Breck, and G. Volpi. 2003. Wolf depredation trends and the use of fladry barriers to protect livestock in western North America. Conservation Biology 17:1538-1547.

Naughton-Treves, L., Grossberg, R., & Treves, A. (2003). Paying for tolerance: rural citizens' attitudes toward wolf depredation and compensation. Conservation biology, 17(6), 1500-1511.

Parks, M., and T. Messmer. 2016. Participant perception of range rider programs operating to mitigate wolf-livestock conflicts in the western United States. Wildlife Society Bulletin 40:514-524.

Rashford, B.S., T. Foulke, and D.T. Taylor. 2010. Ranch-level economic impacts of predation in a range livestock system. Rangelands 32: 21-26.

Ramler, J.P., M. Hebblewhite, D. Kellenberg, and C. Sime. 2014. Crying wolf? A spatial analysis of wolf location and depredation on calf weight. American Journal of Agricultural Economics 96: 631-656.

Ravenelle, J. and P.J. Nyhus. 2017. Global patterns and trends in human-wildlife conflict compensation. Conservation Biology 31: 1247-1256.

Sime, C.A., E. Bangs, E. Bradley, J. Steuber, K. Glazier, P.J. Hoover, V. Asher, K. Laudon, M. Ross, and J. Trapp. 2007. Gray wolves and livestock in Montana: a recent history of damage management. Proceedings of the 12th Wildlife Damage Management Conference.

Steele, J.R., B.S. Rashford, T.K. Foulke, J.A. Tanaka, and D.T. Taylor. 2013. Wolf (*Canis lupus*) predation impacts on livestock production: direct effects, indirect effects, and implications for compensation ratios. Rangeland Ecology and Management 66: 539-544.

Stone, S.A., S.W. Breck, J. Timberlake, P.M. Haswell, F. Najera, B.S. Bean, and D.J. Thornhill. 2017. Adaptive use of nonlethal strategies for minimizing wolf-sheep conflict in Idaho. Journal of Mammalogy 98:33-44.

Treves, A., M. Krofel, and J. McManus. 2016. Predator control should not be a shot in the dark. Frontiers in Ecology and the Environment 14:380-388.

Valerio, A., C.S. Borrego, L. Boitani, L. Casadei, A. Giulani, R.B. Wielgus, S.L. Simek, and M. Valerio. 2021. Detecting the effects of predator-induced stress on the global metabolism of an ungulate prey using fecal metabolomic fingerprinting. Scientific Reports 11:6129.

Van Eeden, L.M., A. Eklund, J.R.B. Miller, et al. 2018. Carnivore conservation needs evidence-based livestock protection. Plos Biol 16:e2005577.

Wagner, K. K., Schmidt, R. H., & Conover, M. R. 1997. Compensation programs for wildlife damage in North America. Wildlife Society Bulletin, 312-319.

Widman, M., M. Steen, and K. Elofsson. 2019. Indirect costs of sheep depredation by large carnivores in Sweden. Wildlife Society Bulletin 43: 53-61.

Wilson, S.M., E.H. Bradley, and G.A. Neudecker. 2017. Learning to lives with wolves: community-based conservation in the Blackfoot Valley of Montana. Human-Wildlife Interactions 11:4.

Young, J.K., Z. Ma, A. Laudati, and J. Berger. 2015. Human-carnivore interactions: lessons learned from communities in the American West. Human Dimensions of Wildlife 20:349-366.