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DEPARTMENT OF FISH AND WILDLIFE
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March 25, 2026

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SUBJECT: GENERAL WASTE DISCHARGE REQUIREMENTS FOR COMMERCIAL LILY BULB OPERATIONS IN THE SMITH RIVER PLAIN, DRAFT ENVIRONMENTAL IMPACT REPORT (SCH# 2024100484)

Dear Brenna Sullivan,

On February 2, 2026, the California Department of Fish and Wildlife (CDFW) received a Draft Environmental Impact Report (DEIR) from the North Coast Regional Water Quality Control Board (North Coast Water Board/Lead Agency) for General Waste Discharge Requirements for Commercial Lily Bulb Operations in the Smith River Plain (Project/Order). CDFW appreciates the opportunity to provide feedback and understands the Lead Agency will accept comments through March 30, 2026.

As the Trustee Agency for the State's fish and wildlife resources, CDFW has jurisdiction over the conservation, protection, and management of fish, wildlife, native plants, and the habitat necessary to sustain their populations (Fish & G. Code, §§ 1801 & 1802). As a Responsible Agency, CDFW administers the California Endangered Species Act (CESA) and other provisions of the Fish and Game Code that conserve the State's fish and wildlife public trust resources. CDFW offers the following comments and recommendations in our role as Trustee and Responsible Agency pursuant to the California Environmental Quality Act (CEQA; Pub. Resources Code, §21000 et seq.). These comments are intended to minimize Project impacts on public trust resources.

Project Description

If adopted, the Order would apply to all commercial lily bulb operations in the Smith River Plain Hydrologic Subarea and coastal terraces between Pyramid Point and the Oregon border, in Del Norte County, California. Regulatory coverage would extend to all fields cultivated for lily bulbs within a sequential five-year period, as well as appurtenant field roads, greenhouses, and pesticide mixing areas. Lily bulb operations have the potential to discharge agricultural pollutants to surface water and groundwater from runoff, the application of pesticide and fertilizer, erosion, and the removal and suppression of riparian vegetation. The purpose of the Order is to protect and restore beneficial uses and achieve water quality objectives specified in the North Coast Basin Plan. The Order would establish a regulatory mechanism to control waste discharges from commercial lily bulb operations through requirements, prohibitions, and provisions. Enrollees would be required to apply management practices to control discharges, conduct monitoring and reporting, and implement adaptive management.

CDFW Consultation History

CDFW has been engaged in developing the Order for over a decade, advocating for salmonids and underscoring the need for substantive water quality protection. In 2017 and 2018, CDFW conducted water quality sampling and co-authored the resultant Smith River Plain Dissolved Copper Monitoring Report (NMFS and CDFW 2018) with the National Marine Fisheries Service (NMFS). CDFW also collaborated on the Smith River Plain Water Quality Management Plan (NCRWQCB 2021). Most recently, CDFW commented on the Notice of Preparation (NOP) for this DEIR, served on the Technical Advisory Group (TAG), and participated in multiple agency meetings.

Biological Significance

The Smith River is one of the most pristine, undammed river systems in California, renowned for its natural beauty, biological diversity, and ecological importance. The watershed is recognized as a salmon stronghold and considered irreplaceable with respect to population resiliency and biodiversity. Although the upper watershed is protected through public land ownership, the estuary and coastal tributaries are subject to ongoing habitat loss and degradation associated with agricultural use. This lower portion of the watershed, known as the Smith River Plain, provides essential freshwater, estuarine, and wetland

habitat for a diverse array of species and life history assemblages. At least 38 species of fish have been documented in the Smith River Plain (Parish and Garwood 2015), including those of cultural, recreational, and commercial importance. Virtually every species uses the estuary, tidal sloughs, and coastal tributaries during at least one life history stage.

Coho Salmon (*Oncorhynchus kisutch;* ST, FT[1]) migrate through the estuary and mainstem river and rear in low-gradient coastal streams and tidal sloughs. Larger tributaries like Rowdy Creek and Morrison Creek also provide spawning habitat (Parish and Garwood 2015, Walkley and Garwood 2017). Although spawning is concentrated in the Mill Creek sub-basin (Garwood and Larson 2014, Walkley and Garwood 2017), a substantial portion of the population depends on natal and non-natal winter rearing habitat in coastal tributaries and sloughs (Parish and Garwood 2015, Parish and Garwood 2016). These low-velocity waters provide refuge and increased foraging opportunities vital to growth and development, as well as transitional habitat for smoltification. The Smith River population is listed as part of the Southern Oregon/Northern California Coast (SONCC) Coho Salmon Evolutionarily Significant Unit (ESU) and is designated as a core, functionally independent population, meaning that it is critical to the recovery of the ESU. Unfortunately, this population is at high risk of extinction and likely below the depensation threshold (NMFS 2014).

The Smith River is also an important stronghold for other salmonid species, including Chinook Salmon (*O. tshawytscha*; SSC) and steelhead (*O. mykiss irideus*; SSC), which migrate through the mainstem and rear in the lower estuary and coastal tributaries (Zajanc 2003, Parish and Garwood 2015, Parish and Garwood 2016). Spawning has also been documented in the upper reaches of Rowdy Creek and Morrison Creek (Larson 2004, Garwood and Larson 2014), and Chinook Salmon spawn below the Fred Haight Bridge, within the area impacted by lily bulb cultivation (J. Walkley, pers. comm.). The entire Smith River watershed hosts a significant population of Coastal Cutthroat Trout (*O. clarkii*; SSC), which are widespread and abundant in coastal tributaries. The mainstem Smith River is an important migratory corridor for Green Sturgeon (*Acipenser medirostris*; SSC), Western Brook Lamprey (*Lampetra richardsoni*; SSC), Eulachon (*Thaleichthys pacificus*; FT, SSC) and Pacific Lamprey (*Entosphenus tridentatus*; SSC), while the estuary provides habitat for a variety of marine and estuarine fish, including the

[1] Abbreviations: ST – State listed, threatened; FT – federally listed, threatened; FE – federally listed, endangered; SSC – CDFW Species of Special Concern

northernmost population of Tidewater Goby (*Eucyclogobius newberryi*; FE, SSC) (Schmelzle 2015).

Comments and Recommendations

CDFW supports the North Coast Water Board's efforts to protect and restore water quality through General Waste Discharge Requirements for commercial lily bulb operations. Years of water quality monitoring have established a clear nexus between lily bulb cultivation and degraded water quality conditions in the Smith River Plain. Copper fungicides are of particular concern due to their neurobehavioral toxicity, though synthetic pesticides like imidacloprid and ethoprop pose similar threats to salmonids and other aquatic life.

Concentrations of dissolved copper and synthetic pesticides are consistently elevated at monitoring stations downstream of lily bulb fields, often at levels considered toxic to aquatic life. In 2018, Tillas Slough and Delilah Creek were added to the 303(d) List of Impaired Water Bodies for copper, and in 2026, Delilah Creek was added for diuron. Although the most recent Smith River Plain Surface Water Monitoring Report (NCRWQCB 2025) detected fewer exceedances of water quality criteria relative to the 2013-2015 study (NCRWQCB 2018), attributed to voluntary compliance with best management practices and an overall decline in cultivation, there are still consistent and widespread exceedances of copper toxicity thresholds, as well as exceedances of some synthetic pesticides (NCRWQCB 2025). The Smith River population of Coho Salmon is particularly vulnerable to water quality degradation in the lower watershed because it relies on winter rearing habitat in coastal tributaries and sloughs, which are directly impacted by these agricultural pollutants.

Even at low concentrations, dissolved copper can impair or destroy sensory systems that mediate ecologically important behaviors, such as the ability to detect and evade predators, identify potential mates, and respond to migratory cues (Baldwin et al. 2003, NMFS 2007, Sandahl et al. 2007, McIntyre et al. 2012). Effects manifest within minutes of exposure and persist for days to weeks (Baldwin et al. 2003), and there is no evidence of acclimation or compensation (Sandahl et al. 2007). Ethoprop and imidacloprid affect many of the same behaviors (Chung et al. 2023, Laetz et al. 2013, Sandoval-Herrera et al. 2019) and could result in additive or synergistic toxicity. Collectively, these physiological and behavioral effects render fish less responsive to cues in their environment, placing them at greater risk of predation. A reduction in individual

survival and lifetime reproductive success has potential implications for the long-term viability of the Smith River population, particularly if entire cohorts are affected. Spikes in toxicity during the winter storm season (NMFS and CDFW 2018, NCRWQCB 2018, NCRWQCB 2025) correspond to critical periods of juvenile growth and development. Every life stage risks exposure, whether as adults passing through the lower estuary during spawning migration or sub-yearlings and smolts rearing in coastal tributaries and sloughs.

The Smith River Plain is essential to the resiliency and recovery of Coho Salmon and other anadromous fish. There has been significant progress in the restoration of salmon and steelhead habitat, from the removal of fish passage barriers to instream habitat restoration and the reestablishment of ecosystem processes. In addition to projects in the mid- and upper watershed, there are multiple projects in the coastal plain, including Deliliah Creek, Rowdy Creek, and Dominie Creek. There are also plans for extensive estuary and floodplain restoration. However, without also improving water quality, we risk undermining these efforts and creating an ecological trap. Prompt, meaningful action is crucial to the continued existence and recovery of the Smith River population of Coho Salmon.

Pesticide Application Rates

Results of the 2025 Surface Water Ambient Monitoring Program (SWAMP) study (NCRWQCB 2025) demonstrate that current management practices are inadequate to prevent or substantially reduce toxic levels of copper and synthetic pesticides from entering coastal tributaries and sloughs. Chronic and acute copper toxicity were predicted in 31 and 16 percent, respectively, of the samples taken below lily bulb fields (NCRWQCB 2025). Exceedances of water quality criteria were also reported for all three synthetic pesticides, most notably imidacloprid, which exceeded its benchmark six times in Delilah Creek and twice in Tillas Slough (NCRWQCB 2025). Although most exceedances occurred during the winter storm season, both predicted copper toxicity and imidacloprid occasionally registered above thresholds during the dry season, likely due to groundwater baseflow (NCRWQCB 2025). These exceedances indicate persistence in the environment, with the potential for lingering effects well after crop production has ended. However, the Order argues that water quality degradation during initial compliance "is expected to be limited and, in many cases, reversible" (Finding No. 117). There is little data to support this conclusion, and without more stringent controls, the unavoidable delay in implementation is likely to be detrimental to salmonids due to their strict three-year life history. A

substantial portion of the copper enters tributaries in its particulate form bound to sediment and dissolved organic matter (Hurst et al. 2022), where it then accumulates in sediment. However, a change in environmental conditions (such as pH) can shift speciation in favor of the toxic dissolved form. Depressed pH associated with storm events was a primary driver of predicted copper toxicity (NCRWQCB 2025), a trend which may reflect chemical speciation shifts in accumulated sediment in addition to increased dissolved copper in agricultural runoff. Although it may be impossible to redress years of copper accumulation, every feasible measure should be taken to prevent or substantially reduce further discharge.

Many existing lily bulb fields have already implemented best management practices and conform to the Streamside Area setbacks as proposed in the Order. However, these practices have clearly been insufficient to curtail toxic conditions. Moreover, a recent study by Hurst et al. (2024) found that simple grass filter strips reduced the discharge of particulate copper by only 20 percent, did little to address dissolved copper, and were quickly overwhelmed during the winter storm season. Although sample size was limited, these results suggest that Streamside Area widths, particularly as proposed, are unlikely to result in significant reductions in copper discharge. Given the climate and hydrology of the Smith River Plain, even wider setbacks, such as those presented in Tier 1 Adaptive Management, may be inadequate as a standalone practice.

The most reliable approach is to systematically reduce pesticide application rates in tributary watersheds with exceedances, as the North Coast Water Board originally recommended in its 2025 SWAMP Report. Normalized application rates of copper were highly correlated with predicted chronic copper toxicity, and imidacloprid showed a similar trend (NCRWQCB 2025). CDFW therefore recommends requiring attainment of active ingredient performance standards for all enrollees rather than presenting it as one of several options in Tier 1 Adaptive Management (**Recommendation 1**). The Order already contains innate delays associated with implementation; the baseline requirements should therefore be sufficiently robust to address water quality degradation on a biologically meaningful timescale.

Streamside Area Requirements

CDFW supports the concept of Streamside Areas, which can be an effective means of tempering adverse water quality impacts associated with adjacent land use practices. However, the efficacy of stream setbacks depends on

design and implementation, as well as environmental context. As discussed in the Findings (46), research indicates that stream setbacks of 33 to 100 feet are generally necessary for water quality protection and bank stabilization (Castelle et al. 1994, Wenger 1999, Fischer and Fischenich 2000, Fischer et al. 2000, Mayer et al. 2006, NRCS 2020). Optimum width depends in part on how pollutants are transported; sediment-bound pollutants may be efficiently trapped within the first 25 feet, but widths of at least 50 feet may be necessary for soluble pollutants (King et al. 2016, Cole et al. 2020). However, as previously mentioned, simple grass filter strips may have limited functionality in a floodplain system characterized by heavy winter rain and seasonal inundation (Hurst et al. 2024). CDFW has previously recommended more active planting and management to optimize the capacity of Streamside Areas. However, CDFW understands Streamside Areas are intended to implement the Temperature Policy of the Basin Plan, and the North Coast Water Board cannot prescribe the particular manner of compliance with its orders.

Given these regulatory constraints and the hydrology and soil type of the Smith River Plain, CDFW recommends increasing the minimum width of Streamside Areas to 100 feet on perennial streams and 50 feet on intermittent and ephemeral streams, as measured from the top of bank or edge of existing riparian dripline, whichever is greater (**Recommendation 2**). At least half of this total width should be managed as the Riparian Vegetation Area, as proposed. Although a simpler Vegetated Buffer may be appropriate for hydrologically connected ditches, the minimal ten-foot width currently afforded would directly undermine the larger setbacks required for streams. Hydrologically connected ditches should be treated as an extension of the stream system because they collect, concentrate, and expedite agricultural runoff, functioning as conduits for pollutant transport. CDFW recommends increasing the minimum width of Streamside Areas to 30 feet on hydrologically connected undesignated channels (i.e., ditches) (**Recommendation 3**), as currently proposed in one of several Tier 1 Adaptive Management options.

Although CDFW understands the purpose of offsite mitigation, it does not support the Riparian Vegetation Area Restoration Alternative because the riparian component is fundamental to improving and protecting water quality and associated fish and wildlife values. A growing body of scientific evidence underscores the importance of riparian shade in lowering stream temperatures (Platts 1979, Bowler et al. 2012, Garner et al. 2017, Fuller et al. 2022), not to mention the myriad benefits associated with pollutant trapping and soil

stabilization. Offsite mitigation may be suitable where it provides a net benefit to impacted ecosystems, but in this case, riparian restoration elsewhere in the sub-watershed would have no bearing on the fundamental problem of water quality degradation in core rearing habitat. The shading and filtering capacity of existing riparian corridors is already limited due to channelization and the suppression and removal of riparian vegetation. Allowing offsite mitigation in lieu of meeting the Riparian Vegetation Area minimum widths would subvert the stated goals of the Order. If the North Coast Water Board chooses to retain the Riparian Vegetation Area Restoration Alternative, CDFW recommends requiring enrollees who select this option to first demonstrate attainment of water quality objectives and compliance with receiving water limitations despite reduced riparian setbacks (**Recommendation 4**).

Adaptive Management Program

The Adaptive Management Program is integral to improving and protecting water quality in the Smith River Plain. CDFW supports the iterative process as well as the decision to enter all fields in tributary watersheds with documented exceedances into Tier 1 Adaptive Management upon enrollment. However, CDFW is concerned about the field-specific approach for all exceedances thereafter (H.5), which may prolong water quality degradation as individual fields rotate through crop production. Current practices have already proven insufficient and fields within a tributary watershed experience similar environmental constraints that may necessitate more advanced controls. With this staggered system, multiple salmonid cohorts could be exposed to toxic conditions in the three- to five-year crop production cycle before more advanced controls finally take effect throughout the watershed. Instead, CDFW recommends a unilateral approach whereby *all fields* located within the affected tributary watershed shall be subject to the Adaptive Management Program, regardless of crop status at the time of the exceedance (**Recommendation 5**). To account for site-specific conditions and provide a pathway for exemption from Adaptive Management requirements, the North Coast Water Board could allow an enrollee to instead implement edge-of-field sampling to demonstrate attainment of water quality objectives and compliance with receiving water limitations, as described in H (3) (**Recommendation 6**). A more systematic approach to Adaptive Management cannot undo decades of water quality degradation, but it may compensate for the inevitable delays associated with the initial implementation of the Order.

Monitoring and Reporting Program

The Monitoring and Reporting Program is essential to evaluate the effectiveness of the Order's terms and conditions, assess compliance, and trigger Adaptive Management. The North Coast Water Board's decision to transition from the hardness-based California Toxics Rule (CTR) to the Biotic Ligand Model (BLM) will provide a more sensitive and biologically relevant prediction of copper toxicity, and the addition of two surface water monitoring stations will facilitate a more targeted approach to address benchmark exceedances. However, the proposed sampling frequency may not be sufficient to allow for oversight and meaningful feedback. The most recent SWAMP studies (NCRWQCB 2018, NCRWQCB 2025) included three or more wet season sampling events and at least two dry season sampling events, and occasionally extended almost year-round (e.g., 2022, 2023). The Order would instead reduce sampling frequency to only three times per water year during the wet season, omitting dry season sampling altogether. It would further restrict sampling by changing the definition of "wet season" from October through May to November 1 through April 30. However, storms producing more than an inch of precipitation occur outside that narrower window and could rapidly mobilize agricultural pollutants. Missing the "first flush" of the rainy season due to a mismatch with the prescribed sampling schedule could fail to detect exceedances during a critical period for salmonids. Moreover, there were several exceedances of water quality criteria for imidacloprid and predicted copper toxicity during the period that would now be defined as the "dry season" (NCRWQCB 2018, NCRWQCB 2025). In fact, the only exceedances of imidacloprid in 2024 occurred during the dry season and were not associated with precipitation in the preceding 24 hours – exceedances that would not have been detected under the proposed sampling schedule. To improve the sensitivity of the monitoring program and ensure timely feedback, CDFW recommends adhering to the sampling framework of earlier SWAMP studies, with at least three wet and two dry season sampling events and a schedule that captures the shoulder seasons in October and May (**Recommendation 7**). Sampling could be pared back in the future if results confirm that reduced sampling would not affect detection probability.

DEIR Mitigation Measures

CDFW agrees with the DEIR's assessment of the Order as largely beneficial to biological resources, though we believe it must be strengthened to effectuate immediate and substantial change. The only comment pertaining to the DEIR is a refinement of Mitigation Measure BIO-1, which addresses potential impacts to

biological resources associated with the construction and maintenance of management practices (e.g., grassed swales, detention basins). Rather than advising enrollees to avoid and minimize disturbance to sensitive habitats and special status species, CDFW recommends explicitly restricting new construction to the footprint of existing fields *outside* Streamside Areas (**Recommendation 8**). If construction would encroach into Streamside Areas or extend beyond the footprint of existing fields and appurtenant field roads, the enrollee would have to assess habitat conditions and undertake additional environmental review and permitting, as described in the mitigation measure.

Summary of Recommendations

1) Require attainment of active ingredient performance standards for all enrollees rather than presenting it as one of several options in Tier 1 Adaptive Management.

2) Increase the minimum width of Streamside Areas to 100 feet on perennial streams and 50 feet on intermittent and ephemeral streams, as measured from the top of bank or edge of existing riparian dripline, whichever is greater.

3) Increase the minimum width of Streamside Areas to 30 feet on hydrologically connected undesignated channels (i.e., ditches).

4) If the North Coast Water Board chooses to retain the Riparian Vegetation Area Restoration Alternative, require enrollees who select this option to first demonstrate attainment of water quality objectives and compliance with receiving water limitations despite reduced riparian setbacks.

5) Implement a unilateral approach to adaptive management whereby *all fields* located within the affected tributary watershed shall be subject to the Adaptive Management Program, regardless of crop status at the time of the exceedance.

6) To account for site-specific conditions and provide a pathway for exemption from adaptive management requirements, the North Coast Water Board could allow an enrollee to instead implement edge-of-field sampling to demonstrate attainment of water quality objectives and compliance with receiving water limitations.

7) To improve the sensitivity of the monitoring program and ensure timely feedback, adhere to the sampling framework of earlier SWAMP studies, with at least three wet and two dry season sampling events and a schedule that captures the shoulder seasons in October and May.

8) Rather than advising enrollees to avoid and minimize disturbance to sensitive habitats and special status species, explicitly restrict new construction to the footprint of existing fields *outside* Streamside Areas.

Thank you for the opportunity to comment on this DEIR. Please contact Kathryn Rian, Environmental Scientist, at Kathryn.Rian@wildlife.ca.gov with any questions or comments.

Sincerely,

DocuSigned by:
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