Chapter 7
Watershed Management Goals and Strategies

Long Term Vision for the Van Duzen River Basin

Our long term vision for the Van Duzen River Basin is a return to a more pristine natural environment, where healthy ecosystems function to maintain and promote vibrant cold water species throughout the region. While we are concerned about natural ecosystems throughout the Pacific Northwest, and of course, Northern California, we are especially concerned about the state of watershed health in the Lower Van Duzen River Basin. We envision an area that offers clean, cold water for the benefit of the local communities and visitors who will be able to enjoy a multitude of activities afforded by a healthy watershed and riverine system, including swimming, hiking, nature trails, world class fishing, clean surface and ground water sources, and clean, safe drinking water.

Short Term and Long Term Goals

Our short term goals are perceived as those that will be achieved in the next five to ten years, as opposed to long term goals that could reasonably be expected in the next 30 to 50 years. Short term goals are obviously more easily and readily attained than long term goals, and consist primarily of achieving improved policies with respect to timber harvest, placement of monitoring equipment into streams, calculations of upslope conditions, and placing habitat improvement mechanisms into key streams of importance.

Long term goals would relate more to the ecological and economic benefits of a new paradigm established through pursuing the strategies of the watershed management plan, including significantly reduced levels of siltation and sedimentation, deeper pools and stream channels, adequate shade and sufficiently cool microclimates around streams owing in large part to a vigorous riparian zone and canopy, intact multi-aged redwood forests that promote greater tree maturity which adds to forest complexity and ecological stability, and finally, renewed and vigorous runs of salmon, steelhead, and cutthroat trout in the streams and tributaries of the lower basin. It would be highly unlikely that any real improvement in stream conditions could be accomplished in the short term. However, the establishment of strategies and connectivity among concerned citizens, private industry, and state agencies can immediately begin building the framework necessary to assure that the anticipated long term goals become a reality.

Strategies for Future Activities in Watersheds (Land Use, Planning, Regulation, and Partnerships)

The primary problems facing the Van Duzen River Basin today are those that relate to siltation and sedimentation of streams, sedimentation being the primary cause of reduced numbers of salmonids during all parts of their life cycle (either directly in the form of silt or indirectly in the form of course sediment). As an organization, Friends of the Eel River promotes the benefits of clean water at every opportunity, and through its many interactions with the public, such as summer events and the newsletter, continually strives to educate people about 1) ways in which these streams have been degraded, and 2) ways in which we as members of the community can work for change and the improvement of conditions in the watersheds. Some of these options include:

- Hold public forums and other opportunities such as stakeholder meetings that will be organized to allow for public comments, and encourage the local community to learn about the importance of watersheds and a vibrant cold-water fishery. Members of the Van Duzen Watershed Project routinely speak up for preservation of forests, especially redwood forests, not only for the benefit of watersheds and fish, but of late, because intact forests have taken on even greater importance with regard to Carbon Sequestration.

- Speak about benefits of a healthy river system. Members of the community need to be made aware of the economic benefits that healthy streams bring, both in terms of 1) tourism when visitors tour our area and stay to enjoy the natural beauty of the redwood forest and pristine rivers and streams (healthy watersheds are attractive and serve to encourage visitors to stay in the area and of course patronize local businesses while they are here), and 2) the sport fishing industry, which used to attract people from across the country in quest of the world class salmon and steelhead that could be found here.
- Work within local county agencies, including county planning departments, to encourage sound management principles in, for example, the county General Plan. Members of the Van Duzen Watershed Project have used their acquired knowledge to speak at planning commission meetings for more sustainable forests and a greater emphasis on healthy watersheds.
- Work with the Van Duzen Firesafe Council to maintain and continue to improve the serviceability of all county roads, especially with regard to the buildup of debris, understory vegetation, and excess fuels, as well as recognition and rehabilitation of failed culverts.
- One of the advantages of an implementation project is the opportunity to work with industry in a cooperative manner that would benefit both the company and the objectives of the project. Our monitoring, as well as restoration projects on the hillsides and in the streams, will achieve much greater success when performed in cooperation with Humboldt Redwood Company (HRC), which owns the majority of the lands where the sensitive watersheds are found. Therefore the success of an implementation project absolutely depends on the cooperation between the project and the company that would be achieved through mutual objectives.

  If, as it has stated repeatedly, the company is concerned about the impacts of it activities in the watershed, and it is concerned about reducing sedimentation in the streams and the survival and success of salmon, then mutual objectives exist and should be jointly sought. HRC has been receptive to our proposals of monitoring and restoration projects on their lands. This cooperative venture could realistically mark the beginning of a new paradigm that will foster a new opportunity for recovery of the redwood forests, clean water, and salmon in the Van Duzen River Basin.

Regulatory Strategies

- Part of the strategy behind a watershed project implementation program will be to advocate for proper use of land and engage governmental agencies such as the Humboldt County Planning Department and the CA Department of Forestry (CDF) with regard to the importance of healthy forests and clean water. It is especially important that CDF be made aware of the need to implement more rigorous regulations and more stringent safeguards for forests, especially with regard to cumulative effects, that are increasingly problematic as forests are harvested repeatedly over time.

CDF needs to identify and adopt new and improved Best Management (Forest) Practice (BMP) regulations that advocate for more sustainable harvest methods. Some of these methods would include longer periods between re-entry into these forests, especially redwood that require at least 40 to 60-year intervals, 300 foot buffers around fish-bearing streams, restricted harvest on steep and/or geologically unstable slopes, elimination of clear cutting in favor of multi-aged harvest (Berrill and O'Hara 2003), and extremely restricted use of tractor yarding methods.

- Redwood forests are among the most efficient absorbers of carbon dioxide in the entire world. Therefore, the value of intact, healthy, and mature redwood forests takes on even greater importance in light of climate change that is virtually undisputedly the result of carbon dioxide accumulation in the earth's atmosphere. Local, state, and federal governments need to be continually reminded of the importance of forests and their very important role in carbon sequestration.
- It is also important that the County of Humboldt take on greater responsibility with regard to how it views its lands and land management, and how timber harvest plans are interpreted. The County General Plan is currently being reviewed for the next 25 year cycle, and it is critical that planners and county officials understand the importance of intact forests and the role these forests play in reducing the amount of sediment entering local streams, and reducing the amount of carbon dioxide in the earth's atmosphere.

  County ordinances need to be enacted that will recognize the importance of intact timberlands, and restrict the urbanization of these lands. These lands need to be perpetuated as forests and therefore harvested for timber. However, additional ordinances that specifically define the manner of acceptable harvest need to be in place. Timber harvest should be rigorously monitored in the ways discussed in previous chapters, especially with regard to riparian no cut buffers, steep slopes, unstable geology, harvest and yarding practices, and re-entry time intervals. County officials need to adopt a plan that will preserve large tracts of forest as timberland that can be a source of timber, if harvested sustainably using multi-age harvest methods, and an asset to the community at large. Humboldt County is at a crossroads, and decisions made now will affect the look and complexion of these lands for years to come. Decisions made by County officials today will determine to a very large extent whether we will have salmon and clean water in the years to come.

Restoration Projects to Benefit Watersheds

Strategies for restoration projects are thoroughly described and discussed in the numerous chapters within the Watershed Management Plan, and fall into three categories: 1) policy augmentation and change, 2) modification of upslope conditions, and 3) modifications to improve stream habitat and physical factors such as temperature that impact cold-water species. Most of those in the policy category are listed under regulatory strategies above. Some of the projects proposed for improving upslope conditions include:

- Decommission logging roads whenever possible, especially bulldozer-cut skid trails; remove all road remnants that directly impact streams.
- Train timber harvest employees to serve as scouts on roads and around culverts, and to regularly check all roads and culverts for failures.
- Removal and/or replacement of failed culverts with more safely designed structures, such as concrete bridges.
- Re-engineer roads so that they do not serve as through-ways for water and debris torrents as they have in the past.
- Encourage all timber companies and logging operators (e.g., through tax incentives) to move from tractor yarding towards more ecologically sound methods of aerial yarding (helicopter, cable, etc.).

Some of the projects proposed for improving instream conditions include:

- Implement an instream monitoring program where turbidity threshold sampling (TTS) stations can be established to collect data on turbidity and suspended sediment on an annual basis.
- Engage in the planting of hardwoods and conifers within stream riparian zones to increase the shading and microclimate moderating capacity, as well as enhancement and deepening of the channel over time.
- Inventory and map sources of stream bank erosion (e.g., landslides) and prioritize according to present and potential sediment yield, to identify sites that should be treated to reduce the amount of fine sediment entering streams.
- Where appropriate, provide support for stream banks with bouldering, cabling, and wing diverters to prevent loss of soil and encourage stream meandering.
- Add large wood to streams where appropriate to encourage scouring and pool enhancement, especially critical for salmonid habitat.

Research and Monitoring to Fill Data Gaps

The overriding question with regard to data gaps is “How much sediment yield and sediment delivery is natural, and how much is the result of human activity such as timber harvest (i.e., controllable)?” Pacific Watershed Associates attempted to answer this question while developing the first estimates of Total Maximum Daily Load or TMDL for the Van Duzen River Basin (PWA 1999). They concluded that the amount of controllable sediment deposited within the basin was equal to about 23% of the total, thus indicating that 77% of the sediment throughout the basin was of natural origin, and further stated that their metrics probably overestimated the amount of controllable sediment. Additionally, it was reported that of the three sub basins (upper, middle, and lower), there was dramatically more management-related

sediment in the lower sub basin (36%) versus the middle (16%) or the upper sub basin (20%). While our inclination is that these data actually underestimate the amount of controllable sediment, we have no data to corroborate this contention.

- Therefore, more on-the-ground data need to be collected in the manner of the PWA study, in order to confirm and verify these reported results. As it has been over ten years since the project was concluded, it would be within the realm of a sound implementation project of engage PWA in a cooperative effort to initiate a second TMDL study of the Van Duzen River Basin to verify the relationships between management-related and natural sediment yield processes, and also to update and determine how the sediment budget in the basin has changed over the last ten years.

Another looming data gap is the relationship between sediment yield on the land, as was reported in the PWA study in 1999, and the levels of suspended sediment in the streams, as could be recorded by turbidity threshold sampling (TTS) stations. To date, there have been no studies proposed to quantify how suspended sediment and turbidity are affected by sediment yield, in space and time. In other words, how much suspended sediment and/or turbidity in the streams is produced from sediment coming from landslides and other types of earthflows, and how much time is necessary before these effects are observed. Obviously, questions such as this are not easily answered and may never be fully answered, but studies can be structured in such a way as to at least address the problem.

- In the event that a second TMDL study were to take place, it would be of great value to have multiple TTS monitoring stations in place prior to, and after the TMDL effort. With sound instream data on turbidity and suspended sediment, the initial steps to establish and quantify this relationship could be made. Eventually, with time, TTS stations, located appropriately with regard to unstable terrain, could be effective surrogates for on-the-ground and aerial photo reconnaissance, and serve as excellent indicators of current water quality conditions, and whether the conditions are meeting TMDL expectations.

Educational Strategies

The Watershed Science in the Schools Program was very successful because it brought together teachers, administrators, students, and members of the community in a mutual concern for common goals, which include preservation and restoration of watersheds, forests, and clean water, and the wildlife that depend on them.

The implementation project will be structured to provide a chance for volunteers from the local community to work with students and provide, in a sense, extended educational opportunities for the students to become exposed to concepts not normally covered in the classroom. Some of these concepts would include: 1) the inter-relatedness between geological processes and vegetation, 2) the impact of timber harvest management on forest complexity and stability, sedimentation, riparian zones, and the channel migration zone, 3) the impact of introduced

species such as the pike minnow not only on salmonids but on other life forms (amphibians, reptiles, insects, etc.) that use the river and streams during their life cycles, 4) the relationship between forest complexity and ecological stability and economic sustainability, 5) the importance of the redwood forest not only in conferring stability in the watershed and clean water in the streams, but the important role in carbon sequestration, and the importance of adopting realistic methods to offset global climate change. Some of the other programs that will be supported by the project will include the following.

- Conduct workshops at local schools regarding salmon migration.
- Employ place-based learning (a process that uses the local environment as a context for learning) in the Adopt-a-Watershed model.
- Encourage local schools to adopt a local stream for study.
- Conduct macro invertebrate sampling in the field with students.
- Conduct gravel experiments in the field with students.
- Take turbidity samples in the field with students.
- Train students to use a turbidimeter.
- Encourage students to use their power of observation.
- Train students to use proper protocol in recording data.
- Train students in the use of GPS devices.
- Encourage science fair projects related to the watershed.
- Facilitate high school students from the Fortuna Creeks Project to mentor elementary school students.
- Implement the Science in the Schools program where scientists share information about careers in science, daily life experiences, and education.
- Model scientific procedures and management practices with students and scientists working in streams, observing, collecting, and analyzing data.
- Encourage members of the community to participate in events sponsored by local watershed groups, including Friends of the Eel River, Friends of the Van Duzen River, and Humboldt Watershed Council.

Impact of the Watershed Plan on Future Decision-Making Processes

State agencies are obviously faced with very difficult decisions with regard to protecting and conserving environmental quality throughout the State of California. Forces of conflicting interest are constantly at odds vying for pre-eminence in the eyes of state officials, and always seeking favorable decisions by state policy makers. As one agency among many, and as one problem among many, the CA Water Quality Control Board (WQCB) is faced with the arduous task of trying to appease state authorities, federal agencies and other state agencies, and the private sector. Therefore, the task of protecting environmental quality is altogether more difficult when so many different interests expect to be satisfied. However, it is the prime directive of the WQCB to safeguard the sources of surface and ground water throughout the

state, and because of this, the task set before it is great. As an organization, we heartily appreciate the opportunities that this agency provides to groups such as ours to engage in water quality protection and preservation, and hope that these opportunities will continue in the future.

We realize the need and understand the importance of engaging in cooperation with other entities, some of whom may be involved in activities that directly counter our own interests. However, it is often the case that this type of cooperation, even when potentially uncomfortable, often produces better results than would have been achieved without it. Moreover, in many cases the overall outcome can result in more favorable conditions for all parties concerned. For example, improving best management practices (BMPs) will ultimately create a more stable forest ecosystem that will better protect stream environments, and foster a greater return of salmon and steelhead. These conditions will also, in the long run, produce greater monetary returns for lumber companies, and will also be of benefit to the local communities – residents because they will experience a higher quality of life, and the business community because of greater revenues stemming from increased tourism and sport fishing. Therefore, all participants in the cooperative effort will realize some benefit, which emerges as one of the long term goals of the implementation project.

Certainly, however, if the long term goals of the Watershed Management Plan are to be achieved, cooperation cannot stop at the grass roots level. Adequate policies must be in place to encourage and obligate the forest practices industry to implement new BMPs and to continue to focus on methodologies that contribute to the overall well being of the resource. If these policies are to be implemented, cooperation must also exist between state agencies, specifically between the California Water Quality Control Board and the CA Department of Forestry (CDF). Currently, we see the role CDF with respect to setting standards for timber harvest plans (THPs) to be nothing short of abysmal. While we accept that WQCB would prefer to have more influence on the THP approval process, it is our perception that CDF rigidly restricts any outside interference. In corroboration of this statement, it has been extremely difficult and virtually impossible for us as members of the community to have any influence on the decisions made by CDF with regard to proposed THPs in this area.

Therefore, we feel it is necessary for WQCB to exert an even greater effort to cooperate and influence the policies and decisions made by CDF with regard to timber harvests in Northern California. The CA Department of Forestry absolutely needs to change the paradigm of timber harvest in this part of the state to a more ecologically balanced set of standards. While these standards or recommendations have been thoroughly discussed in this document and numerous parts of our watershed management plan, the most important of these must be 1) elimination of clear cutting as a silvicultural practice in favor of multi-aged harvest methods, 2) elimination of, or severe limitation on tractor yarding and road construction in the forest ecosystem, 3) increased riparian buffer zones to 300 feet around fish bearing streams, 4) elimination of timber harvest on steep and/or geologically unstable slopes, and restriction of forest re-entry times after timber harvest to at least 40 to 60-year intervals.

By passing nearly blanket approval of nearly all THPs over the last 30 years the California Department of Forestry, as represented primarily by the Fortuna office, has been complicit in the onslaught on forests perpetuated by Maxaam and other timber companies. CDF should be aware that it can no longer be "business as usual" because its actions interfere with the precepts of clean water, which is the responsibility the Water Quality Control Board. For this level of cooperation between these two agencies, there needs to be greater communication and clarification of the priorities of the State and people of California. For healthy watersheds and clean water to exist, CDF needs to act to alleviate some of the pressures that have been and continue to be imposed on the land by human activity.

The Water Quality Control Board is very concerned that funding invested in restoration projects prove to be good investments that result in successful projects with clearly defined beneficial outcomes. This priority is, of course, understandable and justifiable. However, it is inherently understood by most individuals who are familiar with ecology, hydrology, and stream morphology, that given enough time in the absence of human activity, these watersheds would return to a healthy state on their own. Moreover, if the activities that led to these problems are not abated in an environmentally acceptable manner, no amount of restoration will succeed, and these projects, for the most, will be doomed to failure. Therefore, the very best recommendation for the Lower Van Duzen River Basin and all other basins throughout the Pacific Northwest is that these watersheds need to rest, and rest means to be left alone for a while. Trees need time to reach greater maturity, forests need time to achieve greater complexity, streams need time to run clean, and salmon need time to return to their earlier abundance.

Chances for Success

There is a high probability that these watersheds will return to normal functioning systems with healthy streams that serve as vibrant habitat for salmon and steelhead and cutthroat trout, but only if recommendations for regulatory strategies that could benefit the watershed such as ordinances, permits, land conservation practices, site design, and improved best management practices are observed and enforced by state regulatory agencies. Moreover, success will only occur if reviews of future harvest plans follow rigorous guidelines for management strategies that adhere to recommended BMPs and clearly foster a philosophy of restoring and maintaining properly functioning ecosystems. The California Department of Forestry needs to adopt a new paradigm away from rubber stamping industrial requests backed by corporate pressure and mandates, and move towards a greater responsibility for watershed health by focusing on stewardship of the land, forests, and streams rather than corporate profitability. Whether these goals actually become realized will depend upon the commitment of all aspects of society, from the local communities at the grass roots level through private industry, and up through and including our governmental agencies. With a unified commitment among all branches of society, maybe these goals will come to pass.