September 9, 2003

Dear Colleague,

We understand you are interested in the nearshore/marine environment of Puget Sound. As you are well aware, this environment is critical to the health of our salmon and the many other creatures that form the rich diversity of Puget Sound. We would like your comments on the attached early draft of the proposed Nearshore-Marine Component of the Puget Sound Technical Recovery Team and Shared Strategy *Integrated Recovery Planning for Listed Salmon* (Watershed Guidance) document. We hope this nearshore-marine component can serve all of us by defining how to use the good work of many throughout Puget Sound to build the nearshore-marine components of the Shared Strategy Salmon Recovery Plan.

Three specific questions we would like your feedback on are:
1. Does this approach build on and enhance your current work in the nearshore-marine environments?
2. Will the existing information assimilated through this approach guide us in taking the best possible actions to protect and restore the areas of significance in Puget Sound for salmon?
3. What suggestions do you have that could improve its usefulness to you?

Your comments on this early draft by September 19th will help us develop a new draft by the end of September. Many of you are included in this original distribution because of your connection to key groups working on these issues. Please distribute this document to others who you know would be interested in participating in this early review and comment.

Shared Strategy for Puget Sound (Shared Strategy) is collaborative effort of many interested groups to develop a salmon recovery plan for the Puget Sound region. The recovery plan will include a chapter for each of the fourteen watersheds in Puget Sound plus chapters which address region-wide issues. The watershed chapters will be developed by groups working within the planning areas designated on the attached map. These chapters will include both fresh and saltwater components. Additionally, a regional chapter will be developed specific to nearshore-marine issues to incorporate initiatives like the Puget Sound Nearshore Ecosystem Restoration Project (PSNERP) and technical and implementation issues best addressed at the regional scale. The recovery plan is scheduled for completion by mid-2005 and initial draft content for habitat, harvest and hatcheries will be prepared by June 2004.

The Nearshore/Marine Guidance is a component of the *Integrated Recovery Planning for Listed Salmon: Technical Guidance for Watershed Groups in Puget Sound* (Watershed Guidance) draft document. The Shared Strategy staff, work group and the NOAA

1

44 Fisheries-appointed Puget Sound Technical Recovery Team (TRT)[1] worked closely to
45 develop the Watershed Guidance.   The proposed Nearshore-Marine component is
46 concurrently being reviewed by the TRT, Shared Strategy work group and others during
47 this early review process.
48
49 The Watershed Guidance is based on the foundation that viable salmon populations occur
50 when sufficient abundance, productivity, spatial distribution and life history trait diversity
51 exists through each of their life stages. The bottom line of recovery is measuring how
52 populations perform against these viable salmonid population (VSP) parameters
53 (abundance, productivity, spatial distribution and life history trait diversity) and taking
54 actions to improve conditions for salmon populations and reduce the risk of extinction. In
55 freshwater systems our knowledge, along with recently developed models, can provide
56 for quantitative predictions of how populations will perform given alternative suites of
57 actions. However, available tools, information and the added complexity of the
58 combined use of the nearshore-marine environment by all Puget Sound populations limit
59 our present ability to make quantitative predictions relative to the VSP parameters in the
60 timeframe of the Shared Strategy process (a plan by June 2005). Due to these
61 constraints, the proposed Nearshore-Marine component of the Watershed Guidance uses
62 spatial structure, quality, quantity and diversity of habitat types as a near-term surrogate
63 for the VSP parameters. Useful work can be completed in the Shared Strategy timeframe
64 by defining the linkages between habitat type and salmonid population spatial structure
65 and diversity. Information gathered and learned through this intermediate step will
66 inform and support the longer-term progress towards being able to describe the salmon-
67 specific impacts and benefits of habitat actions through the VSP parameters and our
68 understanding of nearshore processes.
69
70 Shared Strategy is based on the belief that current efforts underway across the region can
71 be built upon to create a salmon recovery plan. This is true for the nearshore-marine
72 environments. There are many groups working at the local scale as well as focused on
73 the whole Puget Sound. We hope this guidance recognizes and taps into the expertise and
74 current efforts of all groups interested in the nearshore/marine environment and
75 ultimately supports restoration and protection efforts broader than salmon. To this end,
76 we designed the attached document consistent with existing guidance from:
77   • **Puget Sound Technical Recovery Team:** *Planning Ranges and Preliminary*
78   *Guidelines for the Delisting and Recovery of the Puget Sound Chinook Salmon*
79   *Evolutionarily Significant Unit* and *Integrated Recovery Planning for Listed*
80   *Salmon: Technical Guidance for Watershed Groups in Puget Sound*
81   • **Puget Sound Nearshore Ecosystem Restoration Project (PSNERP) Nearshore**
82   **Science Team:** Science Framework, *Guidance for Protection and Restoration of*

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[1] The Puget Sound Technical Recovery Team is a group of regional scientists convened by the National
Oceanic and Atmospheric Administration (NOAA Fisheries) to develop the biological basis for a salmon
recovery plan for the Puget Sound Evolutionarily Significant Unit (ESU).

EARLY DRAFT
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Puget Sound Nearshore Scientists and Practitioners
9/8/2003

83   *the Nearshore Ecosystems of Puget Sound* and *Juvenile Salmon in the Nearshore:*
84   *A White Paper*
85   • **Salmon Recovery Funding Board Screening Committee**[2]: *Guidance for*
86   *Evaluating SRFB Nearshore Assessments and Nearshore Proposal Review*
87   *Documents.*
88   • **United States Fish and Wildlife Service's Puget Sound and Olympic**
89   **Peninsula Recovery Unit Teams:** Guidance currently under development.
90
91   Of equal importance is the intent to support local efforts in refining and/or developing
92   the nearshore component of their chapter and integrating this work with their freshwater
93   approach. Our interest in putting this document out early for review and comment is to
94   solicit feedback on the approach and improve it based on local and regional expertise and
95   needs.
96
97   The attached document mirrors the Watershed Guidance in that it uses a series of
98   questions following the five steps of the Shared Strategy process to assist planners in
99   creating a scientifically sound technical basis for their recovery plan strategies.
100   Consistent with the Watershed Guidance the questions in this document seek to clarify
101   how habitat can be used as a surrogate to address the constraints associated with VSP
102   parameters in the nearshore-marine environments. Timeframes specific to producing
103   information are noted in the document.   We will incorporate comments from you by the
104   end of September and convene groups to discuss the approach in October.
105
106   We are just beginning to develop our database of those working on nearshore-marine
107   issues. They can also contact me directly to be added to the list for future distributions of
108   information. We apologize for duplicate mailings but are using several databases to
109   ensure that the distribution of this document is broad and inclusive. The cover letter and
110   document will also be available on our website at www.sharedsalmonstrategy.org by
111   middle of this week.
112
113   Please submit your comments to Carol MacIlroy at cmacilroy@sharedsalmonstrategy.org
114   by September 19th.   I may also be contacted at 206-447-7626 with questions and/or
115   comments.
116
117   Sincerely,
118   Carol MacIlroy
119   Watershed Liaison, Shared Strategy for Puget Sound

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[2] Tim Smith (PSNER Policy), Tom Mumford and Hugh Shipman (PSNER Technical), Bill Graeber (PS TRT), Lloyd Moody (Shared Strategy) and Terry Wright (NWIFC).

Proposed Nearshore-Marine Component of the Watershed Guidance

Comment: Citations yet to be included.

Context for Nearshore-Marine Component

Shared Strategy for Puget Sound (Shared Strategy) is collaborative effort of numerous groups throughout the region to develop a salmon recovery plan for the Puget Sound region. The recovery plan will include individual chapters for each of the fourteen watersheds in Puget Sound plus chapters that address region-wide issues. The watershed chapters will include both fresh and saltwater components. Additionally, a regional chapter will be developed specific to nearshore-marine issues to incorporate initiatives like the Puget Sound Nearshore Ecosystem Restoration Project (PSNERP) and technical and implementation issues best addressed at the regional scale. The recovery plan is scheduled for completion by mid-2005 and initial draft content for habitat, harvest and hatcheries will be prepared by June 2004.

The Nearshore/Marine Guidance is a component of the *Integrated Recovery Planning for Listed Salmon: Technical Guidance for Watershed Groups in Puget Sound* (Watershed Guidance) draft document. The Shared Strategy staff, Shared Strategy work group and the NOAA Fisheries-appointed Puget Sound Technical Recovery Team (TRT)[3] worked closely to develop the Watershed Guidance. That guidance is based on the foundation that viable salmon populations occur when sufficient abundance, productivity, spatial distribution and life history trait diversity exists through each of their life stages.

The bottom line of recovery is measuring how populations perform against the viable salmonid population (VSP) parameters (abundance, productivity, spatial distribution and life history trait diversity) and taking actions to reduce the risk of extinction for all populations. In freshwater systems our knowledge, along with recently developed models, can provide for quantitative predictions of how populations will perform given alternative suites of actions. However, available tools, information and the added complexity of the combined use of the nearshore-marine environment by all Puget Sound populations limit our present ability to make quantitative predictions relative to the VSP parameters in the timeframe of salmon recovery planning (a plan by June 2005). Due to these constraints, the proposed Nearshore-Marine component of the Watershed Guidance uses the spatial structure, quality, quantity and diversity of habitat types as a near-term surrogate for the VSP parameters. Initial work will be completed in the Shared Strategy timeframe describing the linkages between habitat type and salmonid population spatial structure and diversity. Information gathered and learned through this intermediate step

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[3] The Puget Sound Technical Recovery Team is a group of regional scientists convened by the National Oceanic and Atmospheric Administration (NOAA Fisheries) to develop the biological basis for a salmon recovery plan for the Puget Sound Evolutionarily Significant Unit (ESU).

158 will inform and support the longer-term progress towards being able to describe the
159 salmon-specific impacts and benefits of habitat actions through the VSP parameters and
160 our understanding of nearshore processes.
161
162 Shared Strategy is based on the belief that current efforts are already underway across the
163 region that can be built upon to create a salmon recovery plan. This is true for the
164 nearshore-marine environments. There are many groups working at the local scale as
165 well as focused on the whole Puget Sound. This document is consistent with existing
166 guidance from:
167 • **Puget Sound Technical Recovery Team:** *Planning Ranges and Preliminary*
168   *Guidelines for the Delisting and Recovery of the Puget Sound Chinook Salmon*
169   *Evolutionarily Significant Unit* and *Integrated Recovery Planning for Listed*
170   *Salmon: Technical Guidance for Watershed Groups in Puget Sound*
171 • **PSNERP Nearshore Science Team:** Science Framework, *Guidance for*
172   *Protection and Restoration of the Nearshore Ecosystems of Puget Sound* and
173   *Juvenile Salmon in the Nearshore: A White Paper*
174 • **Screening Committee**[4]: *Guidance for Evaluating SRFB Nearshore Assessments*
175   *and Nearshore Proposal Review Documents.*
176 • **United States Fish and Wildlife Service's Puget Sound and Olympic**
177   **Peninsula Recovery Unit Teams:** Guidance currently under development.
178
179   Of equal importance, this component of the guidance is intended to support local efforts
180 in refining and/or developing the nearshore-marine component of their chapter and
181 should be used as part of an overall strategy to ultimately address the VSP parameters
182 through all life stages.
183
184 **Nearshore-Marine Component of a Salmon Recovery Plan**
185 The estuaries, shoreline areas between estuaries, and open marine waters of Puget Sound
186 region provide an array of habitats critical to salmon survival. The estuary and shoreline
187 areas together comprise what is known as the nearshore. The region's nearshore and
188 marine environments provide four main habitat functions. They are food production and
189 foraging areas, refuge (from predation, winter storms, etc.), areas for physiological
190 change to occur and migratory corridors. Although currently available marine and
191 nearshore habitats support today's salmon populations, salmon recovery will require (1)
192 habitat protection to ensure anticipated human population growth and land development
193 in the Puget Sound basin do not degrade existing habitat functions (2) habitat restoration
194 to ensure sufficient habitat capacity for desired salmon populations into the future and (3)
195 management of harvest and hatcheries in a manner that supports viable salmonid
196 populations.
197

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[4] Tim Smith (PSNER Policy), Tom Mumford and Hugh Shipman (PSNER Technical), Bill Graeber (PS
TRT), Lloyd Moody (Shared Strategy) and Terry Wright (NWIFC).

198   The goal of the nearshore component of a salmon recovery plan is to develop actions and
199   planning area commitments to undertake those actions which protect and restore those
200   places of significance to salmon in the nearshore and marine areas of the Puget Sound
201   region. Fourteen planning areas are included in the Shared Strategy process and are
202   delineated roughly by watershed. A fifteenth planning area focuses on nearshore-marine
203   issues relevant across the region. Commitments developed by these groups must define
204   immediate actions while also, preserving opportunities for future protection and
205   restoration as PSNERP, Skagit System Cooperative and other scientific efforts improve
206   our understanding of how and where nearshore and marine habitats and processes
207   contribute significantly to the viability of salmon populations.

208

209   To achieve habitat protection and restoration goals this guidance asks a series of
210   questions to:
211   1. Determine those places now known in the Puget Sound region to be critical to the
212   growth, movement and survival of salmon.

> **Comment:** Does this list adequately capture the three functions we have listed above?

213   2. Determine hypotheses about how ecological processes and harvest and hatchery
214   management actions affect the potency of these areas.
215   3. Help individuals, communities, and governments develop and implement short-
216   term scientifically robust protection and restoration strategies and actions in
217   support of regional salmon recovery.
218   4. Identify those parties able to protect and restore critical habitats and obtain their
219   commitment to implement the actions necessary.

220

221 Founding Assumptions and Principles

222   The following assumptions and principles, as a whole, shaped the approach to the
223   proposed nearshore-marine component of the Watershed Guidance. It is the assumption
224   of Shared Strategy for Puget Sound and the Puget Sound Technical Recovery Team that:
225   1. Salmon and bull trout move, or potentially move, through the entire nearshore and
226   marine ecosystem in Puget Sound seeking opportunities to feed, take refuge from
227   various threats, and transition between freshwater and marine environments with
228   minimal stress.
229   2. Consistent with the Watershed Guidance, an integrated approach to harvest,
230   hatchery and habitat management in the nearshore-marine environments will be
231   integral to addressing cumulative effects on salmonid populations.
232   3. All watershed planning areas have a variety of scientific information that will be
233   useful in defining protection and restoration strategies. Quantitative habitat
234   expectations will be set for nearshore-marine contributions at the regional scale as
235   the watershed level information is compiled across Puget Sound.
236   4. The nearshore-marine system still has functioning habitats and processes critical
237   to protect and restore.
238   5. Given the growth pressures in the region and our still growing understanding of
239   the nearshore habitats and processes the focus of short-term efforts is to protect

240		existing processes and habitats and to ensure future opportunities for restoration
241		and protection.
242	6.	The Shared Strategy salmon recovery plan will incorporate more technically
243		robust long-term strategies under development by NOAA Fisheries, PSNERP,
244		and TNC as part of an adaptive management strategy as our understanding of
245		what actions are required and how those actions directly benefit fish populations
246		improves.
247	7.	At the planning area scale nearshore and freshwater strategies should complement
248		each other to the degree possible in the Shared Strategy timeline. Estuaries
249		should be addressed both as a critical component of a regional network for the
250		nearshore as well as for their important connection to the freshwater systems.
251	8.	Given the scale of nearshore processes, a salmon recovery plan will need to look
252		at nearshore issues at both the planning area and ESU scale. Additionally, how
253		these pieces are incorporated and linked will be iterative until the June 2005 draft
254		is completed. At that point, adaptive management components of the plan will
255		need to address how anticipated improvements in scientific capabilities across the
256		different scales will be incorporated over time. Chinook, chum and bull trout
257		should serve as indicators of protection and restoration effectiveness.
258	9.	Marine and nearshore habitats within Puget Sound region cannot be accurately
259		linked to specific core bull trout populations without additional information.
260		However, these habitats are recognized as important for providing foraging,
261		migration and maintaining life history diversity. Similar to the approach being
262		taken in the freshwater planning processes, the hypothesis is that in addressing
263		nearshore-marine habitat conditions and processes consistent with what we know
264		is necessary for chinook, bull trout requirements will also, in large measure, be
265		met.
266	10.	There are significant efforts underway that provide regional resources to local
267		efforts. These include: Puget Sound Recovery Unit Team's work on developing a
268		recovery plan for bull trout, PSNERP Nearshore Science Team and papers
269		produced through their efforts, Northwest Straits Commission and Marine
270		Resources Committee structure and process, The Nature Conservancy's bio-
271		regional planning efforts, People for Puget Sound's restoration and shoreline
272		inventory work, the Puget Sound TRT's work to model probability of salmonid
273		use within the 5 regions and the TRT's work with NWFSC to develop further
274		technical guidance on how specific habitats may relate to population VSP
275		characteristics and in particular to diversity and spatial structure.
276	11.	Habitat will serve as a surrogate for VSP during the Shared Strategy planning
277		timeframe.
278		a. Puget Sound marine and nearshore habitat types are recognized as key
279		subcomponents of a nested habitat continuum (referenced in question 2.2
280		as ecological zones) that supports the populations within the listed Puget
281		Sound Chinook and Hood Canal summer chum ESUs.

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282   b. Marine and nearshore habitats within the Puget Sound region cannot
283   currently be quantitatively linked to the viability characteristics of specific
284   salmon populations without additional information and technical tool
285   development.
286   c. A high degree of uncertainty currently exists in regard to the relationship
287   between the condition of the nearshore and salmonid population and ESU
288   persistence. This uncertainty affects our ability to manage the nearshore
289   recovery actions; the assumptions about the functional state of the
290   nearshore also add uncertainty to the watershed technical analyses and
291   planning.
292   d. Given current resources and the Shared Strategy planning timeframe it is
293   not possible to develop comprehensive quantitative tools to measure
294   nearshore-marine contributions to both the population and ESU/DPS scale
295   for productivity, abundance, spatial distribution and diversity.
296   e. Therefore, this guidance suggests that habitat structure and function be
297   utilized for the salmon recovery plan as an interim surrogate relating
298   habitat processes, conditions, and actions in the nearshore to salmon
299   population viability characteristics.
300   f. Further technical work is underway concurrent with the development of
301   the habitat surrogate approach to strengthen the technical basis linking the
302   surrogate to population persistence and thereby reducing the current
303   uncertainty to the extent practicable.
304   12. Populations reliant upon by the same quantity of high quality habitats may have a
305   higher chance of persistence than populations reliant upon degraded habitats.
306   Habitats in the Puget Sound region will need to be well distributed throughout the
307   five regions delineated by the PS TRT. As discussed in the TRT's Watershed
308   Guidance, historic templates can assist us in determining low risk scenarios.
309

Structure and Application of the Document

311 The Watershed Guidance and the proposed Nearshore-Marine component are designed to
312 assist policy and technical staff in creating a plan which fulfills the objectives of the
313 Endangered Species Act (ESA) and other recovery goals. Each document specifies a
314 series of key questions that correlate with the Shared Strategy's 5 step process. The
315 questions in the Nearshore-Marine component provide further assistance in the
316 development of the nearshore-marine section of a salmon and bull trout recovery plan
317 given the complexity of applying the viable salmonid population parameters. Each
318 question is followed by an initial answer to the question or key comments noting the
319 ability of scientists or others to answer the question consistent with the June 2005
320 deadline. Action steps are noted along with those responsible for the task and a
321 timeframe for completion. Tools and models are noted where relevant.

> **Comment:** Tools and models are not yet included.

322
323 The series of questions posed in this document relate solely to Steps 2-5 as the Step 1
324 process of developing a plan outline is complete. Questions 2.1 to 2.7 relate to Shared

325 Strategy's Step 2 commitment to determine the results predicted as necessary for salmon
326 recovery. For the nearshore-marine components the responses to these questions will
327 form the assumptions and expectations that can guide the development of protection and
328 restoration strategies at both the planning area and regional scale. These questions are
329 followed by initial answers which can be used immediately while additional supporting
330 and detailed scientific documentation is built. Questions 3.1-3.6 relate to Step 3 in the
331 Shared Strategy process which asks local groups to determine the strategies and actions
332 underway at the local level and their relation to regional expectations. These questions
333 assist planners in developing a process for determining what actions are needed and
334 tools/models are available.

> **Comment:** Tools/models are still to be added and information on Steps 4 and 5

335

336 The following organizations contribute to the development of a nearshore-marine
337 component through their existing or planned efforts.

338

339 **Local organizations working on nearshore topics (may or may not be linked to**
340 **salmon recovery planning groups):** These groups have existing scientific research and
341 local knowledge critical to shaping a regional approach to salmon recovery and
342 determining and implementing local actions. Examples of general group categories
343 include Marine Resource Committees, salmon recovery efforts, and/or nearshore-marine
344 focused efforts. Examples of specific groups include: South Sound Salmon Recovery,
345 Hood Canal Coordinating Council/ North Olympic Peninsula Lead Entity, Bellingham
346 Bay Restoration Project, Whidbey Island MRC.
347 **Puget Sound Action Team (PSAT):** PSAT has committed to lead the development of a
348 regional nearshore-marine chapter of a recovery plan and facilitate the development of
349 responses to the Step 2 series questions where assigned. As a lead in the management of
350 the Puget Sound Ecosystem Restoration Project (PSNERP) they also serve as a liaison
351 between PSNERP and Shared Strategy.
352 **Puget Sound Technical Recovery Team (PSTRT):** The PSTRT defines the biological
353 basis for nearshore-marine recovery related to Puget Sound Chinook and Hood Canal
354 Summer chum.
355 **USFWS Puget Sound /Olympic Peninsula Recovery Unit Team (RUT):** The RUT
356 defines the biological basis for nearshore-marine recovery related to bull trout.
357 **Puget Nearshore Ecosystem Restoration Project (PSNERP):** PSNERP provides
358 scientific support in developing the biological basis for nearshore-marine recovery
359 through its Nearshore Science Team.
360 **Shared Strategy for Puget Sound (Shared Strategy):** Shared Strategy has the ultimate
361 responsibility for the development of a salmon recovery plan that addresses the
362 nearshore-marine environments. Shared Strategy staff will support people working at the
363 planning area and regional scale to ensure consistency and quality of content and
364 facilitate coordination among planner, policy and technical staff.

365

366 **Key Nearshore-Marine Questions**
367 Step 2 Series Questions

The Shared Strategy process for Puget Sound Chinook and Hood Canal Summer chum recovery includes the development of planning ranges and targets against which restoration and protection actions can be measured. Nearshore-marine scientists can not yet confidently set these types of quantified targets. Nonetheless, questions 2.1, 2.2, and 2.6 generate the best available lists of habitat functions, ecological zones, habitat types and processes and the science that substantiates their contribution to salmon recovery. Questions 2.3 and 2.4 create the basis for determining areas of regional significance to salmon recovery. Planning area groups can use these lists and scientific documentation to shape a strategy consistent with others across Puget Sound for short-term actions and commitments in the nearshore-marine environments.

2.1 What habitat functions does the marine/nearshore environment provide for bull trout, chinook and Hood Canal summer chum in Puget Sound, Georgia Basin and the Strait of Juan de Fuca?

There are four main habitat functions provided by the nearshore, estuarine and marine ecosystems: food production and foraging areas, refuge (from predation, winter storms, etc.), areas for physiological change to occur and migratory corridors. (Simenstad et al, 1982)

> **Comment:** Need to add in citations for adults

Responsibility Scale: Regional for planning area application.

Action/Responsibility: Kurt Fresh et al expand and finish white paper on juvenile salmon use to describe habitat functions for various life stages. Draft paper for peer review by October 2003. Final document completed by December 2003.

Action/Responsibility: Fred Goetz writes white paper describing bull trout utilization of nearshore habitat functions with a draft by December 2003 and final by end of February 2004.

Action/Responsibility: Puget Sound TRT, Puget Sound RUT and NST review and endorse four habitat functions by October 2003 and support development of white papers.

Action/Responsibility: Shared Strategy disseminates initial functions to planning areas by fall of 2003 and white papers by December 2003 to assist in their development of chapters.

Ex: Growth of lifestage x of listed population y through food provision during the months of mm to nn.

10

404 **2.2 How does the continuum of habitat types contribute to the delivery of these**
405 **functions and how does this result in the viable salmonid population (VSP)**
406 **parameters being sufficient for Chinook, Hood Canal summer chum and bull**
407 **trout at different life stages? What are key assumptions and uncertainties? [5]**
408 There is a continuum of habitat types that forms and connects the freshwater,
409 nearshore and marine ecosystems. For the nearshore-marine areas, this question is
410 focused on nearshore-marine habitat continuums, but assumes that connective work
411 with the freshwater system is occurring as a result of working through the Watershed
412 Guidance document. Two scales of habitat continuums will be used to assist in
413 developing our understanding of nearshore habitats for the salmon recovery plan.
414 The first will be ecological zones which will include:

- Estuaries: riverine/tidal, estuarine transitional marsh, emergent marsh and tide flat
- Inland marine nearshore: estuarine nearshore or embayments, high energy nearshore, low energy nearshore
- Coastal marine

420 The second will be the habitat types within this continuum. The ones of greatest
421 interest currently are eelgrass meadows, kelp forests, mud and sand flats, tidal
422 marshes, major estuaries and deltas, small stream estuaries, sand spits, marine areas,
423 beaches and backshore, bluffs, marine riparian zones and estuarine riparian zones.

425 **Responsibility Scale:** Regional
426 **Action/Responsibility:** Puget Sound TRT (Bill Graeber) takes the lead in developing
427 a preliminary list of ecological zones and habitat types by September 2003 with final
428 list by December 2003. Bill Graeber and Kurt Fresh will describe the linkages
429 between the diversity and spatial structure of habitat types and the diversity and
430 spatial structure of salmonid populations by June 2004 consistent with work currently
431 underway by the TRT on these two VSP parameters. Typology work underway by
432 PSNERP Nearshore Science Team will be utilized to compile list of habitat types.
433 **Action/Responsibility:** Based on review of function delivery, document through
434 white papers and other means the current understanding of habitat type/habitat
435 function linkages. Puget Sound TRT (Bill Graeber), NOAA Fisheries (Kurt Fresh),
436 Puget Sound/Olympic Peninsula RUT (Fred Goetz) and others complete by June
437 2004.

439 **Ex:** Beaches and backshore habitats provide for the reproduction of forage fish like
440 surf smelt, sand lance and herring, which are an important food source for juvenile
441 and adult salmon.

443 **2.3 What are the areas of habitat types by zone at the local scale? What is the**
444 **condition/diversity of habitat type within these zones? What connectivity exists**

445	**between these zones? How do these compare with our available historical**
446	**understanding? What are key uncertainties and assumptions?**

445 **between these zones? How do these compare with our available historical**
446 **understanding? What are key uncertainties and assumptions?**
447 (1) The pattern of distribution of habitat types across the landscape and the quantity
448 and attributes of each habitat type determine the relative and absolute importance of
449 the habitat to a specific organism. (2) Existing information on historical abundance,
450 spatial distribution and diversity of habitat types is limited. However, coarse and fine
451 scale information on current habitat types exists for the Shared Strategy planning
452 area. A statement of current conditions coupled with existing historical information
453 can be used to develop short-term goals for desired future conditions. In some
454 instances where processes and structures have been substantially altered
455 (Green/Duwamish and Cedar/Sammamish/Lake Washington systems for example),
456 historic information may be of less relevance for determining desired future
457 conditions.
458
459 **Responsibility Scale:** Regional compilation of local and regional data sets
460 **Action/Responsibility:** PSAT compiles and develops appropriate displays for current
461 location and extent of habitat types by ecological zone throughout Shared Strategy
462 planning area. Preliminary drafts are compiled by November 6th benchmark meeting.
463 **Action/Responsibility:** PSNERP Implementation Committee fall meetings focused
464 on assessments contribute to the development of this information.
465 **Action/Responsibility:** Planning areas work with the information provided on habitat
466 types to determine the condition of those habitats.
467 **Action/Responsibility:** Historic?
468
469 **Example:** Padilla Bay as a nearshore embayment with eelgrass meadows and mud
470 flat habitat features lies in close proximity to several key river systems and other
471 critical habitats. Question 2.2 provides the detail for what critical functions eelgrass
472 meadows can provide for salmon and bull trout.
473
474 **2.4 Where and when are the listed species utilizing the functions provided by**
475 **nearshore and marine habitats identified through 2.3? What plausible**
476 **hypotheses can we generate about how these patterns of use in time and space**
477 **indicate population spatial structure and diversity? What plausible hypotheses**
478 **can we generate about how current population spatial structure and diversity**
479 **compares to historic conditions? What are key assumptions and uncertainties?**
480
481 Habitat types sufficient in quality, quantity, diversity and spatial
482 structure/connectivity are necessary for the recovery of bull trout, Puget Sound
483 Chinook and Hood Canal Summer Chum. Scenarios containing populations
484 separated by the same distance of degraded habitat may have a smaller chance of
485 persistence than scenarios containing populations separated by a diversity of high
486 quality habitat. Diversity of life history types present in a population depends on the
487 diversity and complexity of habitats salmon encounter and occupy. (PSTRT, 2002;

Comment: What assessments of existing data could be completed and what cost and timeframe are required? What additional data should be collected?

Comment: Who is going to compile existing information on historic conditions? By when?

Comment: Check with Mumford or Berry on correct terminology for the two types of eelgrass beds the nearshore program has defined. Also check with Simenstad for the discussion on Hood Canal and on the functions that the eelgrass habitat types provide for salmon.

EARLY DRAFT
For Review by Puget Sound TRT and
Puget Sound Nearshore Scientists and Practitioners
9/8/2003

488　　　Fresh, 2003) While complete salmon utilization information is not known, enough
489　　　data exists to identify regional "hot spots" for local efforts to further explore
490　　　protection and restoration potential. These "hot spots" can be used to generate
491　　　hypotheses about the spatial structure and diversity of the current population and to
492　　　help shape desired future conditions in the nearshore.
493
494　　　**Responsibility Scale:** Regional
495　　　**Action/Responsibility:** PSAT compiles information on salmonid utilization of
496　　　marine shorelines, estuarine systems and open marine waters by December 2003.
497　　　Fred Goetz, Kurt Fresh and Jim Brennan have critical information on this question.
498　　　**Action/Responsibility:** Puget Sound TRT (Bill Graeber) and NOAA Fisheries (Kurt
499　　　Fresh) develop a juvenile analysis to determine trends in utilization in each of the five
500　　　regions by winter 2003.
501　　　**Responsibility scale:** Regional and local
502　　　**Action/Responsibility:** PSAT will convene a series of meetings with regional and
503　　　local scientists to review habitat maps and create hypotheses about areas of predicted
504　　　high utilization, predicted under utilization and habitat gaps. This information can
505　　　support the development of hypotheses and action scenarios. This task will produce a
506　　　draft map of salmon "hot spots" for protection and restoration by February 2004.
507
508　　　**Example:** Padilla Bay provides critical functions for food and protection through its
509　　　eelgrass meadows and proximity to juvenile salmon coming from the Skagit and
510　　　Stillaguamish systems. These areas are under utilized because fish are directed away
511　　　from the resource by the Swinomish Channel structures and are able to find resources
512　　　along Island and Whatcom County shorelines.
513
514　**2.6 A recovered ESU/DPS should contain the natural processes that affect the**
515　　　**potency of nearshore habitats to produce the functions critical to salmon and**
516　　　**bull trout.**
517　　　Nearshore processes create, maintain and destroy the habitats that provide critical
518　　　functions to salmon and bull trout. These processes are the movement and
519　　　distribution of sediment and water; food web processes; human inputs of
520　　　contaminants; nutrient processes; and fish passage and access to suitable habitat.
521　　　**Responsibility Scale:** Regional
522　　　**Action/Responsibility:** The Puget Sound TRT will determine the processes that
523　　　should be addressed in salmon recovery planning hypotheses and strategies.
524　　　Processes will be adopted by October 2003 and informed over time by PSNERP
525　　　Nearshore Science Team progress on understanding nearshore processes.
526
527　　　**Example:** Marine processes are: the movement and distribution of sediment and
528　　　water, food web processes, human inputs of contaminants, nutrient processes and fish
529　　　passage and access to suitable habitat (overwater/underwater and chemical).
530

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2.7 What are the plausible hypotheses for how freshwater, marine and nearshore (estuarine and shoreline) processes affect the formation, destruction and maintenance of habitat types and their distribution in the landscape significant to salmon and bull trout recovery?[6]

The PSNERP Nearshore Science Team expects to provide a conceptual model and framework which will address this question by 2007. For the purposes of the salmon recovery plan, qualitative information will be used where quantitative data does not exist and projects will be monitored to contribute to the development of the larger quantitative NST framework.

Responsibility Scale: Regional

Action/Responsibility: The PSNERP Nearshore Science Team will by December of 2003 qualitatively describe the relationship between freshwater, nearshore and marine processes and the potency of nearshore and marine habitats.

Ex: Beaches and backshore habitats are influenced by the movement and transportation of water and sediment. Areas of deposition are created through the movement of sediment and water in drift cells. This requires a feeder bluff or source of sediment that can be transported to the area of deposition. Blockages between the feeder bluff and area of deposition can result in sediment starvation and change in beach composition.

Answers to the Step 2 series questions will provide our best current understanding of:

- functions provided to bull trout, chinook and Hood Canal Summer chum by the nearshore-marine environments;
- which habitat types by ecological zone are critical to protect and restore based on the functions they provide to salmon;
- the quantity, quality and spatial distribution of these critical habitats across the Puget Sound region;
- key data gaps in our understanding of these critical habitats;
- location and timing of listed species in the nearshore; and
- nearshore and marine processes and their impact on critical habitats and ecological zones.

Step 3 Series Questions

Based on the guidance about habitat functions which sustain salmon and bull trout, the habitats known to provide these functions and the processes hypothesized to create, maintain and destroy these habitat types answer the following questions. Compilation of critical known areas in Puget Sound can be used to influence and inform strategies and actions. Growth pressures, key assumptions and uncertainties should be considered to preserve future protection and restoration opportunities.

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572
573 **3.1 What are the plausible hypotheses for how habitat, harvest and hatchery**
574 **management actions affect the capacity and/or opportunity to utilize nearshore**
575 **and marine habitats or habitat forming processes? What are key assumptions**
576 **and uncertainties?**
577 Qualitative data can be used where quantitative data does not yet exist.
578 **Responsibility Scale:** Planning area; regional for harvest and hatchery actions
579 **Action/Responsibility:** Planning area groups will develop habitat hypothesis by June
580 2004 informed by the regional information provide in steps 2.1-2.7.
581 **Action/Responsibility:** WDFW and Puget Sound Treaty Tribes will develop harvest
582 and hatchery hypothesis by June 2004.
583
584 **Ex:** Shoreline hardening through the historic development of railroad infrastructure
585 has decreased the availability of backshore habitats on the east side of Puget Sound
586 disrupting the movement and distribution of sediment and water. Answers in 2.0
587 series should support this information by substantiating the connection between the
588 functions salmon need with the functions provided by backshore habitats, discussing
589 the types of processes that could affect the maintenance of this habitat type and
590 provide insight into the manner in which this site contributes to regional recovery.
591
592 **3.2 What types and sequence of habitat, harvest and hatchery management**
593 **strategies do the working hypotheses suggest will be needed to protect and**
594 **restore nearshore habitat types consistent with the functional services they**
595 **provide to salmon across the landscape? How will the processes that create and**
596 **maintain important habitat types be incorporated into the types and sequences**
597 **of the strategies? How do these strategies address uncertainty?**
598 Types and sequencing of management strategies should qualitatively or where
599 possible quantitatively be described. Those able to commit to ultimate actions
600 resulting from strategies should be involved in strategy development.
601 **Responsibility Scale:** Regional and planning area
602 **Action/Responsibility:** By June of 2004 groups working regionally like PSNERP,
603 TNC, WDFW and Puget Sound Treaty Tribes and groups working at the planning
604 area scale define types and sequences of management strategies. Groups raise broad
605 policy concerns raised by this question by November 6, 2003 benchmark.
606 **Action/Responsibility:** Shared Strategy and PSAT create opportunities during 2003-
607 2004 to share regional and local strategies so efforts are coordinated and maximized.
608
609 **Ex:** Protect existing forage fish spawning habitat by preventing shoreline hardening
610 on site and identifying and protecting sediment contribution and removal processes.
611 Site A where protection of both the habitat and the processes believed to support it is
612 possible will be protected prior to Site B where the processes believed to maintain the
613 habitat type are believed to be compromised by an isolated feeder bluff. As all forage
614 fish spawning beaches are already protected through existing state law both sites will

15

615   be monitored to determine their suitability over time to forage fish spawning to
616   determine the role processes play in the maintenance of existing sites.
617
618   **3.3 What management actions are in place? In conjunction with other ongoing**
619   **changes to the nearshore/marine environment what will be their net effect on**
620   **the habitat types, functions and processes? What are the key unknowns or**
621   **uncertainties?**
622   Document the results expected from current management actions. Examples include
623   Shoreline Master Programs, Aquatic Lands HCP development, and voluntary and
624   regulatory Marine Protected Areas. How are these results off set by other changes
625   occurring through projected shoreline development or other actions?
626   **Responsibility Scale:** Planning area and regional
627   **Action/Responsibility:** Management actions that impact the Puget Sound region as a
628   whole will be compiled by PSAT and reviewed by planning area groups by June of
629   2004.
630   **Action/Responsibility:** Planning area groups will determine what results they expect
631   to see from planning area scale management actions and will review regional scale
632   information to comment on local applicability by June of 2004.
633
634   **Ex:** "No net loss" policy for forage fish spawning habitats exists across Puget Sound.
635   However, application and effectiveness of this policy have not been documented. XX
636   planning area has written commitment from local jurisdictions to implement the
637   policy and has instituted a mechanism for tracking forage fish spawning habitats to
638   ensure no net loss policy is maintained.
639
640   **3.4 In addition to the actions already in place, what additional suites of actions are**
641   **needed to provide the nearshore and marine habitat conditions, habitat**
642   **functions and habitat forming processes consistent with viable salmon and bull**
643   **trout populations? How does this resulting action scenario address**
644   **uncertainty?**
645   **Responsibility Scale:** Planning area and regional
646   **Action/Responsibility:** To be determined.
647
648
649   **3.5 How will it be determined that actions were implemented as proposed? How**
650   **will we determine if the actions had the hypothesized effect? How will the**
651   **relationship between fish populations and the habitat types, habitat functions**
652   **and habitat forming processes that affect them be measured to inform the long-**
653   **term strategies and actions?**
654   **Responsibility Scale:** Planning area and regional
655   **Action/Responsibility:** To be determined
656
657   **3.6 How will results from the monitoring program be used to modify programs?**

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658   **Responsibility Scale:** Planning area and regional
659   **Action/Responsibility:** To be determined
660
661 **Step 4 Series Questions**
662 Context paragraph to be developed.
663
664 **4.1 What are the plausible hypotheses for the quantity, quality, spatial structure**
665   **(connectivity) and diversity of habitat types necessary to provide the habitat**
666   **function consistent with viable salmonid and bull trout populations? What are**
667   **the key uncertainties and assumptions?**
668   For those areas with more complete scientific documentation planning area scale
669   goals may be applicable. Ultimately it is critical to know how nearshore processes
670   create and maintain the habitat functions necessary to support a viable salmon
671   population. Due to the lack of science yet available to answer this question habitat
672   type will serve as an intermediary step for the purposes of developing a salmon
673   recovery chapter. Precious staff time and resources directed towards creating a
674   recovery plan in the short term should be consistent with efforts necessary to meet the
675   longer term goal. The recovery plan will need to come to some initial quantitative
676   habitat actions for inclusion in the chapter.
677   **Action/Responsibility:** Puget Sound TRT in partnership with planning area and
678   regional efforts determine an interim abundance of nearshore habitat types required to
679   support a viable salmonid population.
680
681 **4.2 Does the suite of proposed actions result in the habitat goals for diversity, spatial**
682   **structure, and abundance meeting the criteria for recovery of the ESU? Does**
683   **the suite of proposed actions provide for long-term development of a framework**
684   **for nearshore restoration and protection?**
685   **Responsibility Scale:** Regional
686   **Action/Responsibility:** To be determined
687
688 **Step 5 Series Questions**
689 Context paragraph to be developed.
690
691 **5.0 What additional management actions are necessary for habitat goals to be**
692   **achieved in the short-term to meet ESU criteria?**
693   **Responsibility Scale:** Regional and planning area
694   **Action/Responsibility:** To be determined.
695
696
697
698