



Kevin COOK <kevin.c.cook@multco.us>

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## Metro's amendment of the comprehensive plan request regarding the North Tualatin Mountains

2 messages

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**Hank McCurdy** <hankmccurdy@gmail.com>  
To: Kevin COOK <kevin.c.cook@multco.us>  
Cc: alison.kean@oregonmetro.gov

Wed, Feb 7, 2018 at 8:10 AM



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Kevin,

Attached is the first part of the memo. I am a day or two late in getting this to you as I said I would. I still have 170 pages to edit and realistically I will be done this weekend.

It is so obvious that Metro's requests will be rejected at the appellate level if the County Commissioners do not send Metro back to the starting line that I am reaching out to Gary Sheperd to see if we can negotiate.

The rest of the memo is on the various criteria. Metro is not even close to meeting it on many material points. I believe that the rest of my memo will be a significant help in your putting together your report.

Thank you for your patience.

Hank McCurdy



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Exhibit D.5

## **Legend of Abbreviations**

Access Plan	North Tualatin Mountains Access Master Plan, April 2016
BB	Burlington Bottoms
BCF	Burlington Creek Forest
CEL	Conservation easement land, a part of the watershed feeding Burlington Bottoms
Corridors Review	Wildlife corridors and permeability-a literature review (Metro, 2014)
County Planner	Multnomah County Department of Community Services Land Use Planning Division
CP	Multnomah County Comprehensive Plan
Ecology Review	“Hiking, mountain biking and equestrian use in natural areas: A recreational ecology literature review” (Metro, 2017)
EPA	Federal Environmental Protection Act
Full Funding Plan	Burlington Creek Forest Natural Surface Trails Grant Application to the Oregon Parks and Recreation Department submitted by Metro July 24, 2017 together with email verifying signature
HH Assessment	Final Report: Burlington Bottoms Hydrology and Assessment, (August 27,1993)
MCF	McCarthy Creek Forest
MCC	Multnomah County Code
ODFW	Oregon Department of Fish and Wildlife
NTM	North Tualatin Mountains
SCP	Metro’s Site Conservation Plan, 2014

HH Assessment

Final Report: Burlington Bottoms  
Hydrology and Assessment, (August  
27,1993)

### **Exhibits**

Reference will be made to five categories of exhibits. The first are those submitted in opposition to Metro's amendment and permits requests, which will be referred to simply as "Exh. 1, 2, 3, etc." The second category is those Metro has submitted in support of its request to amend the CP, which will be referred to as "Amendment Submissions," Exh. 1, 2, 3, etc." The third category is those Metro has submitted in support of the various permits it is requesting. These exhibits will be referred to as "Permit Submissions, Exh. 1, 2, 3 etc.."

The last two categories of documents refer to those Metro submitted in response to the County Planner's letter notifying Metro that its first set of submissions was incomplete. These

documents will be referred to as “2nd Submissions CPA, Exh. 1, 2, 3, etc.,” and “2<sup>nd</sup> Permit Submissions Exh. 1, 2, 3, etc.”

Reference will be made to a great many of the documents Metro has submitted and these documents are incorporated herein as Opponents exhibits.

One final note: Metro’s “North Tualatin Mountains Access Master Plan (April 2016),” (Amendment Submissions, Exh.2), which will be referred to frequently, will be cited simply as Access Plan without further identification. Likewise, Metro’s Site Conservation Plan (2014), (Amendment Submissions, Exh.3) will be referred to as “SCP,” also without further citation.

## **Bullet Point Memo Summary**

Metro has submitted 1300-1500 pages of argument and documents. The opposition memo that follows is comparatively succinct, but is unavoidably lengthy given the complexity of the issues and the number of CP and MCC criteria that need to be addressed. The following incomplete summary should be helpful.

- In addition to Metro's waste of resources to this point, Metro's CP amendment request, if approved, will expose the County to significant liability.
- Metro describes its Access Plan specifically as a "vision" and "guide," not a plan. It asks the County's approval to develop plans for the BCF and MCF as Metro sees fit

putting the County in the crosshairs of an EPA lawsuit, and appeals based on state and local law.

- By its own admission Metro's intent is to destroy two thirds of the habitat in the BCF, contrary to state land use planning goals, the CP and the MCC implementing provisions.
- Metro asks for an exemption to SEC permit requirements because it cannot meet numerous requirements for such permits under the MCC. The County Planner has already denied Metro's SEC exemption request.
- Metro has promoted numerous BCF trail maps subsequent to the Access Plan map of April 2014. It has fatally handicapped its permit applications because its experts have given evaluations of trail map plans that are not the final plan.
- At the request of the County Planner Metro has provided a map plan for the BCF dated December 15, 2017, but has

not declared it Metro's final plan. The County and its citizens deserve to know what the plan is.

- Because Metro has failed to designate a BCF trails map the erosion impact on the highly erodible soil of the BCF cannot be adequately evaluated.
- State Land Use Goal 1 requires Metro to engage with state and federal agencies in the development of its trails plans. The author of this memo has engaged the National Marine Fisheries Service, not Metro. NMFS has yet to weigh in.
- Goal 1 also requires that the public be given the opportunity to participate in the planning process at every stage and be given comprehensible information enabling it to do so. Metro has engaged in a concerted effort to keep the public out of the process after April 2016. Additionally it has failed to give comprehensible slope information on all the various trails proposals it has

made for the BCF, and the one proposal it made for the MCF.

- Metro should have engaged state and federal agencies years ago, before convincing the Metro Council to approve its Access Plan in April 2014. The resulting ODFW directives dated December 15, 2017, the same date as Metro's last BCF trail plans map are so extensive they require Metro to start over. ODFW has not yet commented on Metro's latest December 15, 2017 BCF trail map.
- Metro has made a large number of inaccurate claims and assertions that show a disturbing pattern, and therefore Metro should not be given the benefit of the doubt as an expert agency.
- Metro's own written conflicting statements document most of its many inaccuracies and misstatements, including those about the presence or absence of listed



species, which species presence is common knowledge in the Portland Metropolitan area ecology science community.

- Metro is not in partnership with Haborton Frog Shuttle as it claim- far from it. See Exh. A.
- Metro studiously ignores the importance of the BCF as a vital part of the watershed that is the sole source of clean, cold water for BB, a well known *refugia* for several listed salmonoid species and other species designated as sensitive.
- Metro's lack of stewardship in its activities in the BCF and MCF thus far have hampered wildlife and have created an unacceptable wildfire risk by creating fuel ladders.
- Metro has failed to demonstrate that there is fire department service for its planned park in the BCF, which park it acknowledges will increase fire risk.

- Metro in its Parks Funding Application of July, 2017 has belatedly agreed to survey wildlife presence and patterns in the BCF "to inform trail siting and management of public access."
- Despite its belated willingness to survey, Metro still ignores its obligation to BB. No meaningful surveys can be done in the near term because Metro activities in the BCF, such as thinning, have disturbed the BCF that it will be years before it returns to its pre-Metro activities state.
- Given its conduct in ignoring the science, ignoring its own trails building manual, its numerous misstatements, and obvious bias in elevating recreation over preservation, Metro cannot be trusted to conduct *bona fide* wildlife/habitat surveys.

## Lewis Mumford: 1938

Are you good enough to have this country in your possession? Have you got enough intelligence, imagination, and cooperation among you to make the best use of these opportunities? Oregon is one of the last places in this country where natural resources are still relatively intact. Are you intelligent enough to use them wisely?<sup>1</sup>

### Introduction

Metro has requested that its Access Plan be accepted as an amendment to the CP to give recreational access in the form of what it calls nature parks in the BCF and MCF, two of four forests it owns at the north end of Forest Park in the narrowest choke point between Forest Park and the Coat Range, just before that corridor widens significantly in the NTM as Exhibit

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<sup>1</sup> Mumford was a sociologist and architecture critic who was an associate of F.L. Olmstead and Charles Olmstead, renowned landscape architects who left their imprint on many iconic places in Portland, such as Laurelhurst Park and Terwilliger Boulevard. Mumford made the above comments in a speech to the Portland City Club.

1 shows.<sup>2</sup> Hence, these four forests sit in an extremely sensitive area. Metro however, has yet to produce a clear plan identified as such for the BCF in particular. Instead, it has repeatedly identified its Access Plan, both in that document itself and elsewhere, as a “long-term vision and implementation strategy to guide land management...” (See for instance, 2nd Submissions CP Amendment, p. 37). In other words, the Access Plan is nothing more than a framework for developing a plan.

*Metro's intent and the danger it presents*

Metro repeatedly claims, again in the Access Plan and elsewhere, that it will provide access while preserving and in fact enhancing water, wildlife and habitat. With regard to the BCF this claim is clearly false and it may be so with regard to the MCF as well. Metro also falsely and repeatedly proclaims preservation of these natural values as its highest priority. As will be seen, whatever its plan for the BCF may ultimately be, it

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<sup>2</sup> Metro owns four forests in the narrow choke point of the corridor to the Coast. These are the BCF, the MCF and Abbey Creek and Ennis Creek Forests.

will be one of intentional destruction. By its own admission Metro intends to destroy two thirds of the habitat in the BCF in favor of recreation.<sup>3</sup>

Metro's true plan is twofold. It is to acquire a *carte blanche*, from Multnomah County to create recreational parks and secondly, have its repeated claims that it has used the best science and knowledge of the wildlife and habitat from experts inside and outside of Metro to craft a balanced plan that achieves its above mentioned highest priority, and to have these bare claims be taken as substantial evidence. As will become abundantly clear doing so would be a serious error.

Instead of accepting the Access Plan *carte blanche* as a CP amendment what must be done is to follow the vision/policy reflected in Oregon statute, the CP and its implementing provisions in the MCC, and not that of Metro. State land use

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<sup>3</sup> Metro intends to develop the BCF first and construct the MCF park as a second phase of development and has not yet applied for MCF permits for the MCF. Metro states at page 26 of the Access Plan that it will leave 90 acres out of the 350-acre BCF in habitat as it defines it, which definition will be discussed later in this memo.

goals, administrative rules, the CP and the MCC, all have been laid out with great care and substantial investments of time and effort over the decades and must be followed. Metro is simply attempting to circumvent the law.

Accepting Metro's Access Plan as a valid amendment to the CP will shield Metro from scrutiny and render almost meaningless all the public process of open public meetings that Metro makes so much of. Finally, it would thrust the responsibility for such errors as Metro will make onto the County including Metro's clear violation of State Land Use Planning Goal1.

### *Structure of this memo*

The structure of this memo will be to address the facts in Part One. Metro in all its massive volume of submissions goes out of its way to avoid a discussion of important facts, and when it does it often misconstrues or misstates them.

Part One includes a discussion of the scientific principals involved. These are set forth primarily in two scholarly scientific literature reviews that Metro has authored, but significantly ignored. It also includes a discussion of the topography, soil and the very considerable erosion problem that the soil, fine silt, in combination with the steep slopes of the BCF, presents.

Included further in Part One is a discussion of the wildlife at stake including numerous listed and sensitive species many of which are in BB. Metro studiously ignores BB, other than mentioning its existence. This omission is glaring given that the Burlington Creek Forest is at the bottom of the larger watershed that is the sole source of clean, cold water for BB and that BB is, among other things, a well known *refugia* for listed migrating salmonoids.

For instance, the Oregon State Land Board in response to Metro's funding application to the state Department of Parks

and Recreation recognized that Metro has given short-shrift to the BB. It recommended that a qualified wetlands expert go onsite to both the BCF and BB and assess the situation. (Exh. 4, unnumbered attachment at end of exhibit, Full Funding Plan).

Finally, Part One includes a discussion of the numerous misstatements and, frankly, misrepresentations, Metro has made throughout the process. Some of the most significant misstatements are summarized briefly here and present a troubling pattern.

- That Metro's plan for the BCF protects and in fact enhances water, wildlife and habitat when by Metro's own admission it destroys habitat in two thirds of the BCF.
- Metro's claiming under oath that there are no listed species in the BCF, or anywhere near it, which includes BB, when Metro knows the opposite to be true.
- That it is in partnership with Harborton Frog Shuttle, a volunteer group that has been transporting Red Legged



Frogs, a state designated sensitive species, from the uplands of which the BCF is a part, across Highway 30 to the wetlands along Multnomah Channel where they migrate annually to breed. There is no such partnership. Metro's approach will have a negative impact on these amphibians in particular, but others as well.

- Misstatements of scientific principals contradicting what Metro have laid out in its scientific literature reviews.
- Misstatement of the slopes where its trails will be constructed in the BCF.
- That the vast majority of its trails in the BCF will be in already cleared areas, when the opposite is true.
- That trail construction will follow best practices including Metro's *Green Trails* manual and Portland's *Trail Design Guidelines* when in fact Metro intends to do neither.

Metro makes a number of other statements that are less clearly within the ambit of intentional falsehood, but it would, be generous to attribute them to mere sloppiness, such as the claim on the one hand, that the use of its proposed trails will be light, and on the other hand, their use will be heavy. (Access Plan , p.2, Permit Submissions, p.        ). Claims such as these will be addressed along the way.

Part Two of this memorandum will address the various criteria that Metro must meet under state law, the CP and the MCC in order to construct its parks. Metro's serious credibility problems require that it not be given the benefit of the doubt as experts. This impacts whether it has produced substantial evidence, that is, credible evidence taking the record as a whole, to support a number of its contentions and meet necessary criteria to obtain various permits.

Aside from the substantial evidence question Metro is confronted with serious hurdles of its own creation, caused by

its rushing forward without a plan. Additionally, Metro has made the preposterous claim, which the County Planner has already rejected, that it is entitled to an exemption from SEC permit requirements. (Exh. 2, p. 2, point 9).

The entire BCF has various SEC overlays. As will be seen, Metro's claim of exemption from SEC permit is one that Metro heavily relies on because it cannot meet critical permitting criteria.

### *What is the plan?*

The heart of any plan for recreational access in the NTM must be an accurate map showing where Metro proposes to place its parking lots, related amenities, and trails, as well as the slope where these are to be constructed. This is because erosion is such a serious problem in the NTM. Knowledge of the slopes is critical for assessing the erosion risk. Indeed, Metro's claim as to the slopes in one of its latest maps for BCF trail locations is about half what its expert, Carlson

Geotechnical, says the slopes are. While it is true that Metro's expert, Carlson Geotechnical, could be wrong and Metro correct in its assessment of the slopes, as will be seen, error on Carlson's part is doubtful.

Metro runs into a problem in meeting the various criteria required because as yet, aside from wanting a *carte blanche* to create a plan, it has failed to designate a map of its trails as "the plan." It is clear where Metro wants to put its parking lot and related amenities in the BCF, but where its trails will be has not been declared. Requiring Metro to come up with a definite final map of trails, their location and the slopes on which they are to be installed is not an academic exercise.

After submitting its first set of documents in support of its amendment request and the various permits required for its development the County Planner instructed Metro to "provide a primary site plan of the Burlington site as well as for the individual trail segments." (Exh. 3, p. 1). In other words, the

County Planner is interested in “what is the plan?” This is because the variety of maps for its BCF development have variously added to and subtracted trails, as well as stream crossings and changed their locations.

For instance, Metro’s statement of the length of the new trails it proposes for the BCF ranges from 5 to 7 mile in addition to the existing 2.9 mile loop road. (Exh.2, p. ). Metro claims that it has minimized stream crossings. Instead, Metro’s latest BCF trail map, December 15, 2017, has the highest number of stream crossings yet. (2<sup>nd</sup> Permit Submissions, Exh. 22, and 2<sup>nd</sup> CPA Submissions, p. 85). Depending on which map one looks at the stream crossings range in number from two to eight.

Stream crossings are a significant concern as the discussion based on Metro’s own Ecology Review in the Science portion of this memo will show. The importance of stream crossings is exemplified by the following heading in

Metro's *Green Trails* manual, which bluntly states "**Avoid crossing streams, wetlands and floodplains.**" (Exh. 4, p. 33).

The failure to declare a plan is in keeping with Metro's approach that the County should accept the Access Plan vision statement as a CP amendment giving Metro the discretion to develop whatever recreation parks it sees fit.

As a result of producing multiple maps/plans, Metro has, as will be seen, run into significant problems. Its experts have relied on one or the other of Metro's various plan maps and so Metro has failed to meet criteria requiring certain professional expertise because Metro keeps moving the target, thus, fatally handicapping its experts.

Additionally, state agencies that have looked at this matter have also relied on various and sundry different BCF trail maps. This renders nugatory much of the consultations that Metro has engaged in. Without knowing what the plan

actually is it is impossible to give it the fully informed critique it should have, including that by concerned citizens.

Metro has remained consistent in its location of trails for the MCF, so its plan for this forest seems settled, although that too is unclear because of Metro's position that the Access Plan serve as a visionary to guide development. Allowing the Access Plan as an amendment to the CP renders the CP an amorphous, unenforceable morass with regard to the forests that are the subject of the Access Plan.

There must be some leeway in pinpointing where trails are to be placed so that obstruction by the NIMBY motivated cannot block or derail by minor quibbles something that on the whole that has been carefully formulated within the land use laws. However, Metro's plans, such as they are, go far beyond giving rise to minor quibbles. For instance, although Metro has great digital imagery expertise it fails in any of its maps suggesting where trails might be located to legibly overlay the

slopes for the proposed locations, something that is essential to evaluating the erosion trails will cause. In short, Metro “hides the ball” and in doing so, as will be seen, violates state Land Use Planning Goal 1 regarding citizen participation at all stages of the planning process.

Metro puts forward its expertise and its commitment to the preservation of water wildlife and habitat as its highest priority as the reasons that its broad, sweeping request to amend the CP should be granted. In other words, trust Metro. Based on the entire record the credible evidence does not support doing so.

Metro’s approach is an attempt to rush things through with the hope that the overburdened County Planner and other concerned persons would not be able to sufficiently examine the roughly 1300-1500 pages that it has assembled to support its desire to elevate recreation over water, wildlife and habitat when the opposite is legally required. As will be seen this



rushed approach could have covered up Metro's failure to adequately inventory the wildlife in the BCF, MCF and BB.

The rush to have the Metro Council approve the Access Plan in April 2016, and then the rushed request to have Multnomah County accept the Access Plan as an amendment to the CP, has resulted in an Access Plan, and all plans maps thus far for the BCF, that are ill-formed, incomplete and do not comply with state law. The Access Plan must be rejected even a template for amendment of the CP. The citizens of this County and State deserve better.

Metro has expended tremendous resources in pushing its parks agenda in the BCF and MCF. Its doing so is more than irresponsible. It is unconscionably places the County in the cross-hairs of an EPA lawsuit. (See Appendix A). If the County Commission allows Metro's push for the amendment and permits it requests much more public money will be wasted in a trail of litigation and appeals.

Finally, the ODFW has recently weighed in, but only on the latest BCF trails map that was available to that agency, Metro's October 2017 version. As will be seen from reviewing Appendix B, ODFW has significant caveats that lead to its conclusion that Metro's plan of October 2017 has "adverse effects."<sup>4</sup> ODFW recommends more study to understand the "habitat use and movement patterns of amphibians (and other priority wildlife species)." Given that Metro's December 15, 2017 BCF map plan calls for even more trails and stream crossings it is expected that ODFW would have the same and probably greater concerns. It is clear that before construction of anything commences study of the BCF wildlife and habitat needs to occur.

It is clear that Metro must step back and come up with a definite plan identified as such, engage all the agencies, state and federal, it is required to and inventory the wildlife and

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<sup>4</sup> Appendix B sets forth all known exchanges between ODFW and Metro concerning Metro's plans, including BCF trail maps ODFW has reviewed.

understand the habitat. And finally, it needs to comply with state land use Goal 1 and keep the public informed in the meaningful way that Goal 1 absolutely and clearly requires.

Metro intends to spend almost \$1,4 million dollars on trails, parking and amenities in the BCF. Before money like that is spent on devastating the habitat and wildlife there, maybe a hundred thousand should be spent on seeing if that makes any sense at all. (Access Plan, Appendix B-1.

## PART ONE

### Introduction To Part One

The two biggest fact issues that must be confronted in placing nature parks (that is, trails, parking lots, bike racks, toilets etc.) in the two forests, the MCF and the BCF are: (1) what wildlife is present in them, and in BB, and (2) erosion. Unfortunately, Metro studiously ignores the wildlife that is

present, refusing to inventory it, and it downplays the erosion problem.

The Access Plan and indeed all Metro's plans for the BCF as set forth on various maps of the BCF it has produced subsequently, is one of destruction and not preservation of water wildlife and habitat contrary to Metro's repeated claims. Out of the roughly 350 acres of the BCF only 90 acres of that Forest will remain in "core habitat," as Metro admits at p. 26 of the Access Plan.<sup>5</sup>

Core habitat has been the subject of serious scientific inquiry, as one of Metro's scientific literature reviews documents. It varies from species to species as will be discussed in more detail.

Woven into the Access Plan are two invalid arguments that support this destruction. The first is the false claim that

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<sup>5</sup> Core habitat is the concept upon which Metro hangs its claim to be preserving water, wildlife and habitat above all else. It defines core habitat as pieces of land 30 acres or greater that are not cut by trails or other fragmenting features such as roads or rail lines. (Access Plan, p. iii ).

there is little wildlife in the BCF to worry about, which is coupled with Metro's ignoring the importance of the BCF for BB. The second is that the BCF already gets heavy recreational use and is already so fragmented that more fragmentation will not matter.

While it is true that there is some fragmentation of the BCF as habitat, it is not such that its value as habitat can be discounted. The conclusion Metro want to be drawn from these messages is the BCF is not worth preserving, and that besides, Abbey Creek and Ennis Creek Forests will have no trails at all and MCF will have only minimal new trails. The rest of the message is that parks are good, and that overall, destroying the BCF habitat is on balance not bad considering all the good Metro is doing elsewhere.

Metro's general effort at wildlife and habitat obfuscation is easiest seen in reference to the presence of elk in the BCF. Elk, until recently used to be all over the BCF, at least before

Metro's activities there disturbed them, including the thinning of virtually all the BCF and the laying down of cut trees and brush as obstacles. This has occurred in both the BCF and MCF. (See Appendix A, Citizen Statements). The statements of people that walk the BCF loop road show significant elk presence there before Metro's activities commenced.

As will be seen, Metro's statements regarding elk in the BCF range from they are there, but not as numerous as elsewhere in the area, to there are hardly any there, to at one point saying there were no sign of any, and back again to there are hardly any elk present in the BCF. By its own admission Metro's effort to understand what wildlife are present in the BCF and MCF have been minimal.

In addition Metro has ignored the "elephant in the room," which is the BB. The BCF is a vital part of the watershed that is the sole source of clean, clear, cold water for BB. The BCF sits at the bottom of that watershed on very steep, highly erodible

slopes. Metro fails to acknowledge that BB is used by a number of Federally listed and other species designated as sensitive, let alone evaluate the effect its BCF park will have on these species.

Part of Metro's aim for its MCF park included (and still does) installing what Metro refers to as the "viewpoint trail" through the elk nursery. While Metro has withdrawn the viewpoint trail for the present because public outcry, it has reserved revisiting its viewpoint trail plans after learning the effects of trails on the elk in the BCF, which species it claimed hardly exist in the BCF.<sup>6</sup> (Access Plan, p. 29, Exh. 2, p. 4).

The habitat damage planned for the BCF is especially concerning because of its relation to Burlington Bottom, which is used by a number of EPA listed species, especially

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<sup>6</sup> As non-sensical as it may sound, that in fact is the plan. (Access Plan, p. 29 and Exh. 6, Park Funding Form, p. 4). While Metro's precise words are that it conducted "monitoring" for elk in the MCF and found no sign, the result is the same. In Metro's view there are either absolutely no elk in the BCF, or so few there that they do not matter. How then could lessons be learned concerning the effect of BCF trail on elk that can later be applied regarding the MCF and the viewpoint trail Metro plans to run through the elk nursery if there are a negligible amount of elk in the BCF as Metro claims? This kind of obfuscation permeates the Access Plan.

salmonoids. But the habitat damage is also of great concern because of the species that use the BCF habitat directly. These species include listed salmonoids as well as others listed by the State of Oregon as sensitive, and of course a number of other species ranging from large animals such as bear, cougar and elk, to the smallest voles, mice and invertebrates.

As to the MCF, Metro's intentions are less extreme, but still fundamentally flawed regarding the elk nursery located there.

### **Burlington Creek Forest.**

The BCF sits at the bottom of the 900-acre watershed that feeds BB. The watershed is in good, to very good condition especially the acreage totaling of about 700 acres as follows: the 350 acres of the BCF, the Old Growth Forest Preserve of about 40 acres, as well as privately protected CEL comprising about 315 acres.



The BCF and MCF are central components of the wildlife corridor to Forest Park, a link that ensures the Park's vital ecological diversity, maintaining it as the symbol of the Portland green culture that attracts so many people to our region. Additionally, the BCF and MCF are part of a wider ecosystem that links the Coast Range, the Tualatin Valley and the Sauvie Island/Multnomah Channel areas. . (Exh. 6, p.1).

Between the two forests at stake here the BCF is the most under attack in the Access Plan, although the Access Plan also has serious deficiencies regarding the MCF as well. Because the BCF is directly linked to the ecology of BB, a BPA mitigation site it will be discussed first. It is an area of extraordinary environmental sensitivity.

BB has been extensively studied. It contains "some of the last remaining bottomlands in the area, supporting a diverse array of native plant and wildlife species ... [and] are a remnant of what was once common throughout the region." (Exh. 7, p.

1).<sup>7</sup> BB is an important refuge for the remnants of the great runs of anadromous fish still clinging to life in our region.

BCF is about 350 acres. Its very northwestern part, about one third of the BCF comprising approximately 116 acres, is in the McCarthy Creek drainage. The Access Plan does not call for any new trails in this area. The BCF is roughly bounded by Cornelius Pass Road to its north. McNamee Road cuts through the BCF dividing it into roughly the aforementioned one third that lies to the northwest of McNamee and two thirds to the east of McNamee. (Exh. 8, p. 6).<sup>8</sup>

McNamee road runs roughly north to south through the BCF and up steep, narrow, winding incline from Highway 30 before heading generally south upon reaching the ridgeline of the Tualatin Mountains. From there McNamee moderates into

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<sup>7</sup> The Bonneville Power Administration purchased Burlington Bottoms in 1991 and undertook a multi-year effort to protect, mitigate and enhance fish and wildlife habitat there in partial mitigation for the effects of the BPA's hydroelectric projects on fish and wildlife as required by the Northwest Power Act. The BPA contracted with ODFW to fulfill its obligations in that regard in 1993. ODFW continues to do so.

<sup>8</sup> The map of the watercourses in the BCF found in the HH Assessment, p. 6 is especially illustrative and is included in this memo as Appendix B.

an up and down, meandering, two-mile thread of a road as it proceeds along the ridge to its intersection with Skyline Boulevard. McNamee can be thought of as the dividing line along the ridgeline between the Burlington Creek and the McCarthy Creek drainages, just as McNamee as it comes up from Highway 30.

Where McNamee Rd. cuts through the BCF it is especially steep and narrow. It is here that the access point to the BCF is found. Just downhill about 1,000 feet from the entrance to the BCF, McNamee contracts to an even narrower, one-lane width where it is at its steepest grade under a railroad trestle.

To its south the BCF is bounded by the Knife River Angel Quarry. To the west it is bounded by about 650 acres of private land of which about 315 acres is subject to a conservation easement (Exhibit 9, Conservation Easement Land, hereinafter referred to as "CEL"). To the east the boundary is, roughly speaking, Highway 30, which separates BCF from Burlington

Bottoms, comprising of 417-acres of wetlands and riparian forest.

The CEL is bounded by the BCF to its east and McNamee Road to the west after McNamee Rd. reaches the ridgeline of the mountains. It effectively makes the area, CEL and BCF combined, plus other private land along McNamee Road, 900 acres of contiguous forest comprising the watershed for BB. Thus, including the CEL land and about 350 acres in the BCF there are about 675 acres that is presently very well protected from human activity. The remaining approximately 360 acres of the watershed is forestland with scattered dwellings subject to such uses as the CFU zone and its various environmental overlays allow there. This 360 acres is less protected than the CEL and the BCF, but it is not intensively used.

The CP is aimed at, among many other things, maintaining cohesive forest areas with large parcels intact . Adding to the 900-acre watershed, and BB at 417 acres, are extensive lands

on Sauvies Island across the Multnomah from BB dedicated to wildlife habitat, all part of an ecosystem of thousands of acres in total. Given the size of this area, and its connection to the Coast Range it is not surprising that BCF itself is populated with numerous species and is critical for others in the BB.

These species include a number of those listed under the Federal Environmental Species Act, and Oregon's version of the EPA. It also includes some that have been delisted, like the Columbia Whitetail deer and the Bald Eagle, as well as others that are designated as sensitive under Oregon and Washington law.

Additionally, of course, many other species are present in the BCF and surrounding land that make up the watershed. These additional species have no particular designations and include among a multitude of others animals such as Roosevelt Elk, bobcat, cougar, the occasional Black Bear, rabbits, numerous songbirds, amphibians and reptiles etc. All of these

species, as will be explained in the Science portion of this memo, are vital to the corridor of which both the BCF and the MCF are essential parts because they are sanctuaries where wildlife lives largely undisturbed by human activity.

### **Relevance of Burlington Bottoms to Metro's Access Plan**

The CP is implemented through Multnomah County's land use planning code. (CP, p. 2-2.) Among the numerous code provisions implementing the CP is MCC 33.4500, which sets out the purpose of the SEC (significant environmental concern) overlay. The SEC designation protects both the lands in the watershed and BB because MCC 33.4500 provides that the SEC overlay is made in order to "conserve, enhance, and restore significant natural and man made features including river corridors, streams, lakes, unique vegetation, wetlands and wildlife and fish habitats and to establish criteria, standards and procedures

for the development, change of use or alteration of such features  
“or the *lands adjacent thereto*.” (emphasis added).

The MCC codifies common sense: conserving, restoring and enhancing significant wildlife habitat requires attention to the adjacent lands that are more than marginally important to the habitat. The BCF, as stated in the HH Assessment, will have increasing importance for BB because “[i]n the future, runoff from the off-site watershed [the BCF and the contiguous forestland] will have increasing influence on both the peak inflows and water quality of Burlington Bottoms.” (Exh 8, p. 5). The future spoken about in 1993 HH Assessment is the future no longer. It is now. The watershed and BB, even more so than in the past, must be viewed as a whole.

The upland watershed including the BCF is vital to the BB as its the sole source of cold clean water. (Exh. 8, p. 1, 7). The annual riverine floodwaters that wash into the BB are laden with the accumulation gathered from the cities, suburbs,

industry and agriculture of the Willamette Valley and beyond. Thus, according to the MCC, it necessary to consider the effects activities on the BCF will have on the BB.

BCF contains several streams that run into BB. They begin in the CEL at McNamee Road along the ridgeline. These watercourses run completely through forest without interference of roads except the loop road in the BCF and, presently minimal authorized trails. In short, aside from logging over the last century or so the watershed is largely undisturbed and will remain so unless the Access Plan is implemented.

Aside from thinning, the last logging in the CEL and BCF was about twenty-eight and twenty-five years ago respectively. Additionally, Burlington Creek, the primary watercourse feeding the Burlington Bottoms, runs through 40 acres of old growth forest until it crosses into Burlington Bottoms east of Highway 30. The watercourses in the watershed are without a



doubt as pristine as any in the Metro region. As the Access Plan acknowledges these creeks “...provide clean, and cold water, nutrients and refuge areas for important fish species...” (Access Plan, p. 14). BB itself consists of a number of lakes, ponds, streams and wetland, interspersed by meadows and punctuated by riparian forest. (Exh. 9, HH Assessment, figures 9 and 10, pp. 18-9).

BB receives enough water from BCF to support six beaver dams. (Exh. 7, p. 10).<sup>9</sup> Beavers and beaver dams are very important to salmonoids and are among the features of BB that make it an important and attractive habitat for numerous species including listed species.(Exh. 10. p. 5).

One of the chief difficulties in doing any environmentally responsible development in the BCF itself is that it is upland forest on very highly erodible soil. (Exh. 8, HH Assessment, Appendix 3, pp. 39-40). Moreover, it has a shallow only

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<sup>9</sup> It is also noteworthy that a great deal of the water in BB is cold enough to support salmonoids for a good part of the year (Exh.8, HH Assessment, p. 33) and

moderately permeable soil layer above the fragipan. The fragipan is a largely impermeable thick layer of subsoil. This means that reduction of the soil above the fragipan will make the land even more susceptible to accelerated runoff, the consequence of which will be to funnel sediment from the highly erodible soil into the water courses.

Part of the BCF is in a “Rapidly Moving Landslide area. All of it is in a “Slope Hazard Area’ both of which are subject to landslides. (Exh.11, figures 8, 8.7, table 8.9). Metro does not dispute the BCF has very steep slopes many of which are in excess of 50%.

### **Erosion**

There is currently a 2.9-mile gravel loop road in BCF. The Access Plan triples that distance by adding another 4.85 to 7 miles of trails, confining those additional trails and the loop road to roughly 66% of the BCF, an area of only about 224 acres. (Access Plan, p. 28, Full Funding Plan, p. ). Obviously,

such an addition will significantly change the character of those 224 acres.

The Access Plan also calls for the construction of parking lots, bathrooms, benches, bike racks, and picnic areas in addition to trails. (Access Plan, p. 37). Of course almost all human access has a negative impact on habitat, but the impact the Access Plan will have will be extreme.

As the Access Plan states, the soil in the BCF is primarily Goble Silt Loam. This soil type predominates on the east side of the Tualatin Mountains where the BCF is located. The additional trails the Access Plan calls for will be almost entirely on Goble Silt Loam. (Access Plan, p.28, Exh. 8, HH Assessment, p.14, Figure 8).<sup>10</sup>

The HH Assessment (Exh. 8, p. 13) points to a USDA-SCS classification scale rating the runoff intensity of various soil types' from A to D with A being the lowest and D the highest

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<sup>10</sup> Burlington Bottoms is a BPA mitigation site for the loss of habitat caused by the BPA's dam s on the Columbia and Willamette rivers. As part of an intergovernmental agreement the ODFW is in charge of the effort to restore and maintain Burlington Bottoms as the important habitat that it is.

intensity. Goble Silt Loam is rated C, the second highest.

The Access Plan goes on to state that Goble Silt Loam soils are “moderately well drained,” in contrast to the Cascade Silt Loam on the west side of the ridge found in the MCF and Abbey Creek Forests, which are “somewhat poorly drained soils.”

(Access Plan, p.11). The implication is that the soil in BCF presents no significant problem, which is inaccurate. These statements, combined with Metro’s failure to state that Goble Silt Loam is in fact highly erodible or discuss the impact of the fragipan on trail development, demonstrate Metro’s intent to inaccurately minimize the erosion problem. Metro, however, does concede that “Sediment harms water quality and degrades amphibian and fish habitat.” Metro also acknowledges that “Overall, the topography of the four sites is steep with typical slopes between 20 and 50 Percent.” (Access Plan, pp.11-3).

Beyond conceding the obvious Metro avoids the problem. For instance, in Appendix C to the Access Plan it describes Goble Silt Loam, the soil that predominates in the watershed (see the

discussion of the watershed immediately below) including in the BCF, and mentions the fragipan, but avoids mentioning how far below the surface it is found. The distance between the surface of the soil to the fragipan is important to know in order to understand the erosion trails will generate.

The HH Assessment presents a more accurate and complete picture of the soil, streams, slope gradients and their impact for the future.<sup>11</sup> The HH Assessment treats the BCF, the CEL and the other contiguous private lands as one watershed, which it is. It divides the 900-acre watershed into five sub-basins. (Exh. 8, HH Assessment, pp.5-6). (The 900 acres will be referred to as the “watershed.”). The watershed is the sole source of water for BB, aside from water entering BB during the high flow periods of the Willamette and Columbia rivers. (Exh. 8, pp. 1, 7).

Some of the streams contained in the sub-basins are unnamed, but all can be readily identified for purposes of this

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<sup>11</sup> Burlington Bottoms is a BPA mitigation site for the loss of habitat caused by the BPA’s dams on the Columbia and Willamette Rivers. As part of an intergovernmental agreement the ODFW is in charge of the effort to restore and maintain Burlington Bottoms as the important habitat that it is.

discussion as can be seen from the map at page 6 of the HH Assessment. \*Exh. 8, See Appendix B).

After the HH Assessment was published there was some concern expressed about whether certain streams were perennial or ephemeral with two of the major streams, Burlington Creek and “Stream B,” originally designated as perennial. (Exh. 8, HH Assessment. p.7). The more conservative view was that they were ephemeral.<sup>12</sup> That debate has not been resolved by the USGS now finding that Burlington Creek is a perennial stream. (Full Funding Plan, Exh. 2, RTP Environmental Screening Form, p. 5). In its submissions to the County Planner, the engineers Metro hired also depict Stream B as a perennial watercourse. In any case, Burlington Creek (Stream A on the HH Assessment map, p. 6, Appendix B of this memo) and Stream B drain significant areas of hundreds of acres each. The highest point in the watershed is 940 feet while the elevation of BB averages 34 feet. (Exh. 8, HH Assessment, p. 6). Burlington Creek (Stream A) has a reach of well

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<sup>12</sup> See the clarifying correspondence stapled to the beginning of the HH Assessment.

over a mile and Stream B, a reach of just over a mile. (Exh. 8, HH Assessment, p.7).

As of 1993 the HH Assessment estimated that every other year a storm would generate a flow of 33 cubic feet per second into BB and a ten-year event would generate 81 cubic feet per second. (Exh. 8, p. 8).<sup>13</sup>

With more extreme weather patterns brought on by global warming the frequency of heavy rain storms and other intense weather events is increasing. What was in 1993 a ten year event generating 81 cubic feet of water inflow per second will be more frequent. The HH Assessment did not measure heavy rainfall events. (Exh. 8, p. 13).

Two things tend to filter some, but only some, sediment out

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<sup>13</sup> While a measurement of cubic feet per second is not overly abstract the volume of water flowing into BB from the watershed can more concretely be thought of in terms of a common object such as a filing cabinet. The HH Assessment estimates the flow from the watershed into BB during a pre-global warming two year event is the equivalent of more than three standard sized filing cabinets measuring 27" x 52" x 45" filled with water per second, each. What the volume will be in the extreme weather events is unknown, but the authors of the HH Assessment estimate that a pre-global warming ten year event would generate 81 cubic feet per second, that is, about 6.6 standard sized filing cabinets full of water per second for a period of seventeen hours. (Exh. 8, p. 8).

of the water flowing into Burlington Bottoms from the watershed. These are the ballast for the rail line bed that is directly adjacent to Highway 30, and the vegetation in Burlington Bottoms itself. The railroad ballast removes heavy sediment. (Exh. 8, p. 13). Goble Silt Loam, as will be discussed below, generates fine sediment. Silt one of the finest, most pernicious sediments, travels further in water than larger sediment, such as sand. (Exh.12, p.2) However, the ballast acts a filter for only some water flowing into BB. The two major streams flowing into BB, Burlington Creek and Stream B go through culverts underneath the railroad line, as do most of the other watercourses. (Exh.8, p.16).

The vegetation in BB also helps filter out sediment, but only where the culverts do not discharge water directly into the BB lakes. The HH Assessment states that most do not, but offers no more information beyond that. (Exh.8, p. 13).

The injection of sediment into BB and also into Burlington Creek will have well known negative consequences for salmon spawning beds and the clogging of fish gills. But also, since the



lakes in BB are already shallow, sedimentation will accelerate the process of filling the lakes up turning them into marshes and then bogs, eliminating fish habitat. (Exh.8, pp.18, 39).

Phosphorous is a nutrient that stimulates plant growth in lakes. The origin of the phosphorous in the Burlington Bottoms lakes has not been scientifically determined, but it is present and is suspected to come from the Willamette and Columbia Rivers during the winter and spring flooding. (Exh. 8, p. 37).

Phosphorous frequently comes from fertilizers, animal waste, and detergents, all things that are present upstream in the Willamette Valley and beyond.

Horseshoe Lake, the largest in Burlington Bottoms, is already eutrophic, meaning that it already has excessive nutrients. (Exh. 8, p. 9). A eutrophic lake is one that is dominated by aquatic plants or algae. When plants die and decay they deplete the dissolved oxygen in the water that fish need to survive. When the plant biomass becomes too high fish die-offs result. (Exh.13, p.1).

The reason sedimentation is closely associated with lakes becoming eutrophic is not hard to understand. The shallower a lake is the more light can penetrate to the bottom, which along with nutrients stimulates plant growth, sometimes explosively. (Exh.13, p.5) .If sedimentation combines with the phosphorous already present in the Burlington Bottoms lakes plant growth will accelerate.

Global warming will make the watershed's sedimentation problem worse. It is well known as the earth's atmosphere warms there is greater ocean evaporation and the warmer the atmosphere the greater its capacity to hold water vapor. And so, as the Union of Concerned Scientists has said: "As the Earth warms powerful storms are becoming the new normal." (Exh.14, p. 1). The HH Assessment likewise states that: "In the future run-off from the off-site watershed will have an increasing influence on both peak inflows and water quality of BB. (Exh. 8, p. 5).<sup>14</sup> Metro

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<sup>14</sup> Houston Texas has had three five hundred year floods in just the last few years. Of course a 500 year or 1000 year flood event is an abstraction in the United States since there are no flood records going back that far. However, it is clear that the

acknowledges in its Corridors Review that extreme weather events will occur with global warming. (Exh.15, p.1).

Because of the soil type and steep slopes the watershed is especially prone to sedimentation. Goble Silt Loam covers approximately 96% of the 900-acre watershed and Wauld Very Gravely Loam covers the remaining 4%. (Exh.8, HH Assessment, p.13.). The HH Assessment found that with Goble Silt Loam on 30% to 60% slopes that: “Due to the steep slopes and only moderate permeabililty, the erosion potential is considered high.” (Exh. 8, p.13). It drew the same conclusion for Goble Silt Loam even where the slope is only 15 to 30 percent, that is, that “the hazard for erosion is high.” (Exh. 8, Appendix 3, p. 30.)

As will be explained more fully below in Part Two of this memo, Metro’s expert, Carlson Geotechnical, found the slopes of where Metro’s June 2017 BCF plans to construct ranged from 10% to 66%, and were on the whole well above 25%. For what appears

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occurrence of intense weather events has reached an extreme beyond what was imagined just short while ago.

to be the same June 2017 BCF map Metro claimed that none of the slopes into which its trails would be constructed exceeded 10%.

Additionally, Metro ignores its own advice, repeated more than once in its trail building manual, *Green Trails*, that trails should not be built on slopes greater than 25%. (Exh.4, p.26).<sup>15</sup>

Appendix 3 of the HH Assessment, “Soil Survey Information” provides a good deal of detail. (Exh.8). It is a copy of excerpts from the U.S. Department of Agriculture’s Soil Survey of Multnomah County. Appendix 3 to the HH Assessment notes that fragipan, a solid compacted soil mass that is significantly impermeable, is found 30 to 45 inches below the surface on 15% to 60 % percent slopes, that is, for virtually the entire BCF.<sup>16</sup> The fragipan is generally 5 feet or more thick (Exh. 8, Appendix 3, p. 39-40). As close to the surface of the land as it is, the fragipan has significant implications for trail building.

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<sup>15</sup> Exh. 4, Metro’s *Green Trails* trail building manual contains a thorough discussion of where to site trails and appears to conform to accepted scientific principles as discussed in Metro’s Ecology and Corridors Reviews. Metro ignores much of this well-thought out manual of some 116 pages and another 40 or so pages of appendices and notes.

<sup>16</sup> As will be seen *Green Trails* puts the fragipan only 20 inches below the surface.

Not only is slope important for analyzing the erosive impact of trails, but so too is the width of the trail, as the following discussion will show. Cutting a trail into an average slope in the BCF would eliminate much of the moderately permeable Goble Silt Loam soil on top of the fragipan. An imaginary square with 30-inch sides illustrates the problem. The Access Plan proposes that the new trails for the BCF be 30 inches wide. (Access Plan, p. 21, Exh. 16, point 13).<sup>17</sup> In the Full Funding Plan Metro calls for trail widths from 24” to 48” wide. (Full Funding Plan, Exh. 2, RTP form p.1). In its latest BCF trails map, December 2017, it has trail widths of 36” to 48 “ for two miles, with most of the trails set at 30” wide. (2<sup>nd</sup> Permit Submissions, Exh. 22, p.2).

Cutting the imaginary square in half results in a triangle with one 90-degree angle and two 45-degree angles, and with two sides of the triangle that are 30 inches long on either side of the 90-degree angle. Imagine further that the triangle represents the cut

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<sup>17</sup> The International Mountain Biking Association, whose advice on mountain biking trail construction Metro has been welcomed, calls for trails 24’ to 30” wide in the memo it supplied to Metro and which Metro refers to favorably.

that must be made into a 45-degree slope to establish a trail 30 inches wide.

In order to have a somewhat level trail bed a cut must be made 30 inches deep into the soil because the 90 degree angle of the triangle has to be placed into the slope. This means that the Access Plan version of the trails Metro proposes will sit directly on top of the fragipan in some places, and that the fragipan will be only 15 inches below the surface of the trail bed in others. In places the distance to the fragipan could be even less. According to Metro's *Green Trails* manual it is only 20" below the surface. (Exh. 4, p.26).

If Metro follows the recommendations of Portland's *Trail Design Guidelines for Portland's Park System*, and the International Bicycling Association memo as it apparently intends to do the result will be even worse (Access Plan, p.37, Ex. 16). The Portland Park's guidelines recommend removing organic material in order to establish the trail bed on "mineral soil" for mountain biking. (See Portland's Trail Design Guidelines, Exh.17, p.37).

Where the trail sits right on top of the fragipan almost no rainwater will be absorbed. This means that nearly every inch of water that falls on these portions of the trail will be runoff.

Even if the trail bed does not sit right on top of the fragipan significant problems will result. This is because from December to April of each year a water table is perched on top of the fragipan (Exh. 8, Appendix 3, pp.39-40).

Next imagine that the trail is constructed on a far gentler slope of 25 degrees and is 48” inches wide. Twenty-five degrees is 57.77% of an exactly vertical line (90 degrees). Installing a 48” wide trail would require a vertical cut into the slope 27.33” deep to allow for a 48” trail bed. This too would more than likely cut into the perched water table. For a 30” wide trail bed the cut would be 17.3 inches deep, and even though it might not cut into the perched water table it would eliminate more than half of the moderately absorbent soil above the fragipan.

So, Metro ignores the sound advice found in its *Green Trails* manual, concerning seasonal perched groundwater:

***Perched groundwater.*** Many upland soils in the region have seasonally perched groundwater. This is a regional anomaly that is not common in other areas. In certain soils, weathering has created a shallow hardpan, usually within 20 inches of the soil surface, that concentrates groundwater during the wet months. When a slope is cut to create a “bench” for a trail, this groundwater can rush out to the surface and create cut slope instability, trail slumping and seasonal problems of erosion and wetness [SEP] on the trail. The lower third of slopes, geologic units are also prone to chronic wetness and should be avoided. (Exh. 4, p.25).

As *Green Trails* also points out, north facing slopes are especially a problem because they tend to remain wet longer. The BCF has many north facing slopes as its ravines and valleys run generally west to east, and is subject to the perched water table problem as the HH Assessment shows.

Given that even with the full compliment of undisturbed soil above the fragipan, that is, without any trail or other such disturbance, the soil is not sufficiently absorbent to avoid the formation of a perched water table, the problems are obvious even without a trail that cuts to the fragipan. Where the trail does cut into the perched water table the result will be like taking a jug of water and tipping it over from December to April, causing runoff



even when it is not raining resulting in slope instability and trail slumping.

Further, trails on steep slopes are prone to incision, meaning that they will become deeper. (Exh.15, p. 12-3). This means that where the trails do not sit directly on the fragipan over time they will come closer and closer to the fragipan worsening the erosion problem even more as time passes.

While it is true, as Metro states, the research is inconclusive as to the comparative erosive effects of mountain biking versus hiking, hopefully common sense has a role.<sup>18</sup> Mountain biking has a channeling effect since bike ruts are continuous while the impressions of the human foot tends to create puddles more so than channels. Mountain biking tire ruts will encourage erosion. The more mountain bikers use the trails the deeper and more channelized the ruts will become.

If all the foregoing was not enough, once the trails begin to

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<sup>18</sup> By way of example, all the conflicting research on whether cigarette smoking was injurious to health simply muddled the waters on the issue while common experience was that smoking shortened lives.

be used erosion will worsen. Trail use has a dual effect. Firstly, it loosens the top layer of soil, making it easier to wash away. The second effect is that the soil below the loosened layer becomes compacted making it less absorbent. (Exh.15, pp. 10-12). As will be discussed in more detail below, the use of the proposed trails will not be light, contrary to Metro's contention. (Access Plan, p. 2). Instead, it will be heavy because the demand for mountain biking trails within the Portland metropolitan area is so high as will be discussed later in this memo. (Exh.2, p. )

Portland's Forest Park provides an example of what the additional "multi-use" trails will mean for the BCF. As will be discussed below "multi-use trail" is a euphemism for mountain biking trail because hikers avoid multi-use trails to avoid injury from mountain bikes.

The Northwest Trail Alliance, Metro's preferred partner in the removal of unauthorized mountain biking trails. (Access Plan, p.19). Mountain bikers have been successful in lobbying Metro to become expert consultants on trail construction, maintenance and

monitoring for Metro, a relationship that Metro describes as a “partnership.” (Access Plan, p. 21). Involvement of the mountain biking community is not necessarily a bad thing. It is just that it has not worked if the Forest Park experimental trail is any example.

An experimental single-track mountain biking trail was installed in Forest Park. It has not been a success. Appendix A (see statement of Dr. Catherine Thomas) has photos and an explanation of the experiment. Even with the best of intentions and maintenance by the Northwest Trail Alliance, the Metro partner, experimental trail can only be described as an oozing, eroding mess. Presumably the Northwest Trail Alliance put forth its best effort to maintain the experimental trail in Forest Park to show that mountain biking there will be compatible with preserving and protecting wildlife and its habitat.

It should be noted that the photos in Dr. Thompson’s statement show that the trail was not cut into a slope not nearly as steep as those in the Access Plan and other maps of where Metro

proposes to install new trails in the BCF.<sup>19</sup> As Dr. Thompson remarked, "...opening the door for new bike trails in a natural area that is relatively protected [BCF] could spell disaster." The same soil type as is in the BCF also predominates in Forest Park. (Exh. 6, p. 5, "Forest Park: Desire Future Condition," January, 2011).

There is really no question that Metro's plans for the BCF is to make it a mountain biking haven. Appendix C is about 100 hundred pages of comments from members of the community about the problem mountain bikers present on trails also designated for hiking. Many of those comments are from people who have had to jump out of the way to avoid injury from a mountain biker. Metro's intent to make the BCF a mountain biking haven is all the more clear from the width of the trails it has consistently mapped out. The large majority of them are the narrow single track of about 30" that mountain bikers prefer. (2<sup>nd</sup>

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<sup>19</sup> Of course where Metro proposes to put the new trails is only generally known, but the slopes all though most of the BCF are so very steep it is not an exaggeration to say that Metro proposes trails in steeper terrain than the experimental trail in Forest Park. At least the trails depicted on Access Plan page 28, when cross-referencing to another map that shows slopes, appear to be located on steep terrain, often on 45 degree slopes.

Permit Submissions, Exh.22, p.2, Exh.2, p. 14/24). Multi-use trails designed for both hikers and mountain bikers should be much wider, as Portland's *Trail Design Guidelines* clearly shows. They should be 4' wide with passing areas 10' wide. (Exh.17, p.31). Obviously, trails of this width give mountain bikers enough room to pass hikers with much less risk. But just as obviously building trails of the widths they should be presents very, very serious erosion problems in the BCF.

With a water table above the fragipan during the wettest time on the year, in a watershed with steep slopes covered with only a relatively small amount of moderately permeable silt, the BCF landscape is fragile. Add global warming's increasingly intense weather events to this already erosion vulnerable habitat and the situation is made far worse. Adding the trails Metro's Access Plan and succeeding trails maps calls for, which in many areas will penetrate down to and into the fragipan, and certainly into the perched water table on top of the fragipan, will make an accelerated runoff problem even worse. It is nothing less than a

prescription for a very bad outcome, and not just for the BCF, but also BB. Metro's intent is not just irresponsible, it is unconscionable.

### **Erosion and Sediment**

There has been a good deal of research done about sediment washing into streams and rivers beginning in the 1930s. (Exh.18, p.1)<sup>20</sup> Fine sediment travels great distances in watercourses. For instance, the deposit of sediment from placer mining in the nineteenth century California goldfields continues to this day some one hundred fifty years later. It continues to have serious, detrimental environmental consequences for San Francisco Bay, more than 100 miles away. (Exh. 19, p.2) In contrast to the California gold fields distance from San Francisco Bay, the BCF is just across Highway 30 from Burlington Bottoms, a distance of about 20 yards.

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<sup>20</sup> Effects of Sediment on the Aquatic Environment: Potential NCRS Actions to Improve Aquatic Habitat –Working Paper No. 6, Janine Castro, Franklin Reckendorf, Natural Resources Conservation Service, Oregon State University, Department of Geosciences, 1995, p. 1) hereinafter “Sediment and the Aquatic Environment). Note that the National Resources Council is part of the United States Department of Agriculture.

Sediment's effects for forestry applications has been intensively studied. It is roads, and not timber harvesting practices themselves, that cause the greatest amount of sediment that enters the aquatic environment at an accelerated rate. The channel network is increased because roads act as tributaries. Peak flows are increased as a result. (Exh. 18, p. 26, see footnote 24). Practices to keep sediment out of streams, such as buffers, are insufficient "when a significant road network is in place." (Exh.18, p. 26).

Trails should be thought of as the small roads that they are. There can be little doubt that introducing 4.9 to 7 miles of new trails in a very steeply sloped area of 224 acres of highly erodible soil, which already has 2.9 miles of trails, all of which will be heavily used and channelized by intensive mountain biking, is significant.<sup>21</sup> A section of land is one square mile consisting of 640

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<sup>21</sup> The Access Plan states that 5.5 miles of new trails will be introduced into the BCF, but the description of those trails in the lower right hand corner of the map on page 28 of the Access Plan totals 4.85 miles of new trails. The prose on top of that map "recommends 5.5 miles of new multi-use trails." In subsequent comments and in later trail maps for the BCF, such as the December 2017 map Metro submitted at the

acres. The proposed trails will be jammed into a space just over one third of a square mile. But more than that, a look at the Access Plan's map (p. 28) of proposed trails in BCF shows an intensity of trails in concentrated areas that is undeniable. There are multiple instances of trails stacked one on top of the other up the sides of slopes with what appears to be less than 100 feet between them, not to mention the instances where the proposed trails either violate MCC 33.4750(A)(3) 300 foot from the stream centerline buffer zone or come very close to doing so. In its *Green Trails* manual Metro advises against such stacking of trails. (Exh. 4, p.35). All versions of Metro's BCF trails maps stack trails.

The Access Plan's location of trails so close to water courses may be one of the reasons that since securing the Access Plans passage by the Metro Council that Metro has decided to alter the Access Plan with the Full Funding Plan (Exh. 2) and the October 2017 Plan. However, all the plans Metro has put forward call for

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request of the County Planner the new trails come to 7.7 miles. (2<sup>nd</sup> Permit Submissions Exh. 22, p. 2). In Exh. 2, at the end of Metro's Burlington Creek Forest Natural Surface Trails Application # 3910, on a form called "Land Use Compatibility Statement" Metro calls for from 5-7 miles of new trails.



intense networks of new trails.

The MCC 300-foot stream buffers were put in place by MCC at a time when global warming was thought to be a more distant problem and in fact, denied by many.

The nature of the sediment that will wash into the watershed's water courses and then into BB appears to present a further problem. The word "silt" in the name Goble Silt Loam, the type of soil that predominates in the watershed, is indicative of the soil's composition. The first eight inches Goble Silt Loam is dominated by a "fine granular structure." (Exh. 20, p 1). As mentioned previously, silt is one of the finest/smallest sediment types. Fine sediment is correlated with high mortality rates for salmon and adverse impacts on fish generally. Scientist well appreciate the disastrous problem for spawning salmon that fine sediment presents. Salmon dig out spawning sites in gravel causing water to slow over the eggs. Silt tends to remain suspended in the water column for an extended period, settling out when water slows. So, the problem will also be one for the series of lakes in

BBB. (Exh.18, pp.2-4).

Additionally, when sediment loads suddenly increase, as will occur with our increasingly severe weather events, stream slope increases to accommodate the increased load resulting in the stream channel “vigorously attacking the stream bank” causing it to widen even further, fueling even more erosion. (Exh.18, p. 9).

Another effect can be a reduction in food and oxygen for fish as has already been discussed. Also, many toxins tend to bind to fine sediments. Once polluted in this way water bodies are difficult to clean. (Exh. 18, pp. 13, 17). The mix of fine sediment with pollutants coming from traffic on Highway 30 could, and likely will, pose severe problems.

### **Listed, sensitive and other species and Metro’s failure to assess the wildlife**

In the SCP Metro admits the presence of Coho and Chinook salmon as well as steelhead in the lower reaches of Burlington Creek and in McCarthy Creek. It also acknowledges the presence of the Northern Red Legged Frog as a sensitive

species. (SCP, pp. 4, 23).<sup>22</sup> Beyond that Metro does not say much concerning the BCF especially and MCF. This is because Metro has been intent on downplaying BCF wildlife and habitat to justify its plan to give most of the BCF habitat its death knell.

Metro has failed and refused to do the study it should have. Although now belatedly Metro has committed to doing so in its Park Funding Application.(Exh.2, p.37, Part V Environmental Commitments, point 18. This commitment will be discussed below.

There is a good deal of information, however, that citizens have provided on a non-expert, anecdotal basis. (See Appendix A). The statements in Appendix A document Metro acknowledging that the people living in the BCF and MCF areas know more about the wildlife there than Metro does. Based on that knowledge they oppose Metro's slap-dash plans. The

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<sup>22</sup> As Susan Barnes, ODFW's chief regional biologist, points out in Appendix B the Red Legged Frog has been designated as a "Species of Greatest Conservation Need" in Oregon's over-arching state conservation framework, the Oregon Conservation Strategy.

citizen comments certainly, strongly indicate that real study is warranted, and not study that Metro conducts as it cannot be trusted.

Much more is known about the wildlife in BB because it has been studied. As mentioned earlier, BB is owned by the BPA and administered by ODFW. It was acquired by the BPA in the early 1990's as a habitat mitigation site for the habitat loss suffered as a result of damming the Columbia Basin and Willamette River systems.

Although much of the information about BB is a bit dated, it is independent of the present dispute and therefore reliable. Moreover, the BB habitat has been improving since about 1993 when the BPA and ODFW took it over. Exh. 21 is the *Burlington Bottoms Wildlife Mitigation Project Final Environmental Assessment/Management Plan and Finding of no Significant Impact* . Appendix A to Exhibit 21 contains an extensive list of species known or believed to be present in BB. It is a good

starting point for the BCF, some 20 yards away across Highway 30. Undoubtedly many of the hundreds of species listed in Appendix A to Exh. 21 also use the BCF.

Additionally the process of the planning that resulted in Exh. 21 required the Department of the Interior to determine if the Exh. 21 plan would have a significant negative impact on species under the Environmental Protection Act. In a letter from the Department of the Interior the species found in BB were listed and re- confirmed. (Appendix F). The Exh. 21 plan was found to meet EPA standards.

Metro intends to spend almost \$1,4 million dollars on trails, parking and amenities in the BCF. As stated earlier, before money like that is spent on devastating the habitat and wildlife there, maybe a hundred thousand should be spent on seeing if that makes any sense at all. (Access Plan, Appendix B-1).

Below is a Table that is a partial summarized list of some  
of the important species in the BCF, MCF and BB. <sup>23</sup>

Species	endangered	threatened	Candidate species	Sensitive or species of great concern	Date listed	De-listed	Location
Coho Salmon	yes						BB Burlington Creek, BCF
Snake River Sockeye Salmon	yes						
Howellia		yes					BB
Western Pond Turtle		Threatened in Oregon	Application pending.				BBand BCF
Tri-Colored Black Bird			yes				BB
Townsend's Big Eared Bat, aka, Pacific Big Eared Bat			Yes under California's Endangered Species Act				BB
Bald Eagle						yes	BB and BCF
Columbia White Tailed Deer						yes	BB and BCF
Red-Legged				Yes-Oregon			BB, MCF, an BCF

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<sup>23</sup> The Federal Threatened and Endangered Species list can be found at 50 CFR Part 17. Oregon and most states have their own list of threatened and endangered species lists, which often contain the same species, but not always

Frog							
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Up to this point in time Metro has ignored its own well thought out advice to make a thorough assessment of wildlife and habitat in the BCF, MCF or BB before constructing trails. In its *Green Trails* manual it had this to say:

***Sensitive species.*** Trail planners should particularly seek information about the *locations of habitats of sensitive species – those that are listed as threatened, endangered* under the Endangered Species Act, or for which the need for concentrated actions are noted. *Forty-five vertebrate species are designated as sensitive, threatened or endangered...* These species are listed in Appendix C of this guidebook. (emphasis added) (Exh. 4, p.22).

As mentioned above Metro’s committment in Exh. 2, p.38 to “Survey the wildlife presence and patterns to inform trail siting and management of public access” is late. As will be discussed later in this memo Metro has been engaging in activities that have significantly disturbed the wildlife. Metro has already put the cart before the horse. As noted in by the author of Metro’s Ecology and Corridors

Reviews care has to be taken in surveying disturbed sites because species will have fled (Exh. 25, p. 39). As will become clearer and clearer as this memo progresses, Metro is not to be trusted. This presents a genuine problem in having Metro do the studies needed it has committed to, not the least of all because its own trails manual said it should have been done at the outset. Its comments about “monitoring the elk in the BCF are suspect given the conflicting comments that they have made about BCF elk before. When was the “monitoring done. It is unlikely that it was before the elk were probably driven from the BCF by Metro’s activities. Metro seems to be possessed of a tremendous bias towards installing a mountain biking park and the chances of getting a genuine survey of the wildlife in the BCF is slim. It has already lied about there being no listed species in the BCF or anywhere near it.



## **Metro's Conflicting Representations in Official Documents**

### **Before and After the Access Plan**

#### **a. Metro's misrepresentations regarding endangered, threatened and sensitive species, elk and the Red-legged Frog.**

Metro's application to the Oregon Park and Recreation Department for funding for Metro's BCF park contains seriously incorrect claims in conflict with the Access Plan and SCP that go to the heart of the issues relevant to Metro's request to amend the CP. (Exh. 2, for this section referred to as the "Parks Funding Application").<sup>24</sup>

In the Parks Funding Application Metro was asked a number of questions including "Are there Threatened or Endangered Species or their habitat present?" and "Are anadromous or resident fish populations present?" Metro answered "No" to both questions. It explained, including a comment about BCF elk, that:

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<sup>24</sup> This Exhibit has been renumbered in cursive in the upper right hand corner of each page. A number of pages that were received from the Oregon Department of Parks and Recreation have been eliminated such as deeds and legal descriptions, a lengthy report finding there were no cultural issues presented by the project, survey records, building plans and letters lauding the project such as from the mountain biking community.

No threatened or endangered species are known to be *present in or near the project area*, however, it is assumed that red legged frog, a state sensitive species, migrate on the site from the Burlington Bottoms Wetland site on the east side of Highway 30. (emphasis added)<sup>25</sup>

Although anadromous fish are present in McCarthy Creek Forest natural area, the project is located out of the McCarthy Creek watershed. The site provides habitat to a wide variety of migratory passerine and raptor species. Metro has conducted monitoring of game species (elk): no sign of elk use within the project area. (Exh. 2, p. 35).<sup>26</sup>

These claims, especially regarding fish, fly in the face of Metro's own 2014 SCP for the BCF, MCF and Ennis Creek Forests, which is no longer available online. Further the person signing the form certified that the information contained in it was true to the best of her knowledge. (Exh.2,pp. 1,2, and 38). It is common knowledge among ecology scientists in the area that there are listed fish species that use BB. Additionally, as

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<sup>25</sup> Metro's use of the word "assumed" here is at odds with its claim to have a partnership with the Harborton Frog Shuttle, a group that has been transporting Rd Legged frogs from the uplands of the North Tualatin Mountains, including the BCF, across Highway 30 during their annual breeding season as they migrate to the wetlands near Multnomah Channel, including the BB. (Access Plan. p. 32). .

<sup>26</sup> As will be discussed, during the annual riverine floods and at other times of high water BB braids into McCarthy Creek. There is therefore, a definite connection between the Metro's BCF project and McCarthy Creek, a salmon bearing stream.

Metro stated in its SCP, both Burlington Creek and McCarthy Creek and their surrounding forests contain endangered anadromous fish and provide shelter to numerous other species, including the Northern Red-legged frog, a state listed sensitive species. Using nearly precisely the same language for both the BCF and MCF, Metro stated that:

A thorough ecological inventory and assessment has not been done for the site. Listed and rare species, such as Chinook salmon (juvenile Chinook salmon were detected during fish surveys on Burlington Creek Forest in 2012), northern red-legged frog and others almost certainly occur in Burlington Creek Forest and in more mature forests. Coho and winter steelhead are present in lower Burlington Creek Forest.

**Rare species known to occur at Burlington Creek Forest**

*TBD – No documented occurrences of rare species at Burlington Creek Forest, though species like red- legged frogs, Chinook salmon, steelhead, etc. seem likely. (p. 4, 23-4)*

While Metro’s language in its SCP regarding protected and other rare species is somewhat confusing because Metro hedges by claiming there are no “documented” occurrences, a fair reading is

that Metro believes, and with good reason, that listed salmonoids and other protected species are in fact present in the BCF.

It may be that the “TBD” language in the Site Conservation Plan demonstrates a debate within Metro between those who are willing to dodge Goal 5 responsibilities and those that do not. Even so, despite the “TBD” the SCP still concludes that “*species like red-legged frogs, Chinook salmon, steelhead, etc. seem likely.*”<sup>27</sup>

Metro has good reason to know of the presence of endangered, threatened and sensitive species in the BCF, but especially in BB. Metro’s knowledge comes from both opinions from ODFW scientists and others that it has received as will be seen in the Scienceec] portion of this memo. Also, it is very likely that Metro is aware of the inventory of species that the Bonneville

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<sup>27</sup> Metro admits that no genuine, scientific effort has been made to determine the full range of listed, candidate species, and other rare and sensitive species that are in the BCF. Metro has disregarded repeated pleas that such be done. Members of an informal group, the Tualatin Wildlife Alliance, from early in Metro’s planning process have, for more than two years, at meetings, too numerous to count, been asking (begging really) for a baseline assessment of the wildlife in these forests before the multi-million dollar construction Metro has planned for BCF and MCF gets underway.

Power Administration compiled for BB as part of its mitigation requirements for the loss of habitat caused by the BPA's Columbia and Willamette River dams. (Exh. 21). Metro's claim that "No threatened or endangered species are known to be present *in or near* the project area..."(emphasis added) demonstrates a distressing lack of transparency.

Metro repeatedly claims that it knows what species are present because of its own expertise and consultation with outside experts. This claim is made in in the Access Plan at p. 19 and throughout its submissions in support of its request to amend the CP and for permits.

Unlike many of Metro's statements and arguments, which it is respectfully submitted, cannot be trusted, information from records such as Burlington Bottoms Wildlife Mitigation Project are trustworthy. The Burlington Bottoms Wildlife Mitigation Project resulted from the input of "various Federal and State Agencies, local environmental groups and private citizens." (Exh. 21, p. 2). No one disagreed with the Appendix A to that document entitled,

“Fish and Wildlife Species At Burlington Bottoms.”

Metro’s obfuscation and refusal to make a genuine effort to establish a baseline assessment of wildlife and habitat is of no help. Instead, it again indicates Metro’s deliberate failure to balance Goal Five along with the other Goals as is required by Oregon’s Land Use law.

As far as its carefully worded assertion in the Parks Funding Application regarding elk in the BCF is concerned, Metro’s claim that it has “monitored” elk presence in the BCF is like so many of Metro’s claims, dubious. There are, and have been elk in the BCF for a long time. Poachers and the local people know that. (Appendix C). Metro’s “monitoring” effort on the presence of elk in the BCF appears to be nothing more than an effort at intentional ignorance. Its “monitoring” in this regard speaks to the quality of Metro’s assessment of the wildlife in BCF and MCF in general. In short, it is woefully inadequate. In what seems to be an earlier draft of the RTP

Environmental Screening Form found in the Parks Funding Application Metro was prepared to make an even stronger statement regarding the claimed absence of elk in the BCF .

There Metro said:

Metro has conducted monitoring for game species (elk); no sign of elk use within the project area. (Exh. 5, p. 4).

Metro' statements in the Parks Funding Application were intended to mislead on issues of important state environmental policy. The Access Plan itself is no better. Metro, the supposed partner of the Harborton Frog Shuttle, knew that the BCF is Red Legged Frog habitat. (Appendix B). Even worse, however, is that state agencies were misled and not allowed to perform their functions properly, which include watching out for environmental issues. Some of them may not have signed off if they had known the truth. (Exh. 2, pp. 41-2).

### **Inconsistencies within the Access Plan**

Metro has engaged in a concerted effort to make it appear that it has taken a measured, scientific approach in its plans for

the BCF and MCF. This has not occurred. Metro further asserts that it has calibrated human access in such a way as to meet its commitment to water, wildlife and habitat as its highest priority. This also is untrue. A number of inconsistencies found within the Access Plan itself contribute to these conclusions.

### *Core Habitat*

In its Executive Summary to the Access Plan (Access Plan, pg. iii) Metro claims its top priority is to “protect water quality and preserve core habitat” qualifying that to mean areas of 30 acres or larger, meaning areas that are not segmented by trails, roads, railroad tracks or other dividers. This is the heart of Metro’s claim that its Access Plan protects water quality and preserves core habitat.

An examination of any of Metro’s proposed trail maps for BCF shows that at the very best there will be only one intact area no larger than 12 acres south east of McNamee Road where it divides the BCF. This area comprises about two thirds



of the BCF's total of about 350 acres. The other pieces of habitat in this two thirds will be even smaller.

To the northwest of McNamee Road lies the other third of the BCF. It is divided by a railroad bed that Metro has highlighted in brighter green as core habitat. (Access Plan, p.28) Indeed, the two chunks there are greater than 30 acres each. Thus, by its own admission, under its pinched version of core habitat, Metro is intent on destroying two thirds of the BCF's habitat.

As will be discussed in the Science portion of this memo, an area of 30 acres is the minimum needed for habitat for some species. Others species, including a number of those in the BCF need much larger areas. In any event, the 12 acre piece and the other even smaller pieces that the Access Plan calls for in two thirds of the BCF are inadequate for almost all species, except birds, but even for many birds habitat this size is inadequate.

Where Metro slices the habitat into small pieces is where all the streams feeding BB run. It cannot reasonably be claimed that the Access Plan as it pertains to the BCF protects water quality and core habitat.

*Elk and the lessons Metro claims it will learn from the BCF*

Metro has, for the time being, and after considerable community outcry, deferred plans to run a trail through the middle of the well-known elk calving, foraging and breeding area (elk nursery), in the MCF. Metro's plans for the MCF tie into its plans for the BCF. This is because Metro's decision to defer running a trail through the MCF elk nursery is delayed while Metro purportedly learns lessons from its experience with elk in the BCF, which it intends to develop first. (Access Plan, p. 29).

In fact no such lessons will be learned because Metro has no realistic baseline knowledge of the elk in the BCF and because it is questionable whether Metro would make the effort to

learn anything. The only way trustworthy information would be gained is by having independent scientists, guided by a citizens group not selected by Metro do the appropriate baseline study and subsequent evaluation.

Metro has thinned trees but not put them to the ground in many instances impeding animals' travel through both the MCF and BCF. (Appendix E ). Elk will avoid areas where travel has been made difficult. It will be a considerable time before elk return to the BCF in the numbers existing before Metro's activities commenced. Metro has effectively spoliated the evidence regarding the elk in the BCF and likely many other species once present there as well.

Metro now claims that there are few elk in the BCF. This is a reversal from what Metro first claimed that on all four sites Ennis, Abbey Creek, MCF and, BCF: "wildlife, including elk, bobcat [etc.]...have been frequently observed..." (Access Plan, p.

5). While still stating that elk appeared frequently in BCF,

Metro altered that statement later in its Access Plan as follows:

While no formal mammal surveys have been conducted, staff, visitors and neighbors have observed a wide variety of mammals typically associated with upland forest habitat and riparian forests of this area including elk, black-tail deer [etc.]... Elk and elk sign is commonly observed in North Abbey, McCarthy and Ennis. It is less frequently observed at Burlington [Creek Forest].” (Access Plan, p.14.).

Metro also attempts to downplay the significance of elk in the BCF by stating the ODFW considers it to be in a “de-emphasis area,” as if that were relevant to the discussion. The issue is whether Metro has complied with Oregon’s land use laws and not whether on a comparative basis Lynn or Douglas County habitat, or some other place in Oregon should be emphasized for elk habitat for hunters or whatever ODFW feels its focus should be in a particular location.

But, Metro does point out that ODFW considers forage, in particular, grass as one of the biggest factors “limiting Elk in

the North Tualatin Mountains.” (Access Plan, p. 32).

Interestingly, there are at least 20 acres of grass in the BCF, about twice the amount as in the MCF’S elk nursery area, where unquestionably elk abound. The PGE utility right of way runs from the BCF’s southern most point to at least McNamee Road. It is overrun with Himalayan Blackberries, but nevertheless 10% to 15% of it is grass. (Access Plan, pp. 6 and 8). In addition, the existing one lane gravel 14’ wide, 2.9 mile loop road probably has an additional 1.2 to 1.8 acres of grass along its borders.

Even though there are no open area access viewpoints to see into BCF from McNamee Road like there are for the MCF , people who walk the existing 2.9 mile loop road see elk there in groups ranging from just a few animals to those in the teens and one sighting of a herd of 30 animals. Further, not far from the BCF there is plenty of elk sign and sighting of elk herds themselves. (Appendix E). It seems appropriate, therefore, to

believe Metro's statement that elk are frequently seen in the BCF, and not Metro's statements that there are hardly any there at all.

Metro acknowledges there has been no baseline study done to determine the extent of elk in the BCF, and has explicitly stated it has no plans to do so because, as it has repeatedly and publicly said, such a study would be "too expensive and would not show anything anyhow." (Appendix E). Metro claims to have knowledge of the animals that use habitat such as the BCF from a "substantial body of research" and input from "external experts." (Access Plan p. 16). This makes Metro's conflicting statements concerning elk and listed fish in the BCF all the more curious. If Metro claims to have all the knowledge it needs then why can't it make a clear statement about the wildlife that use the BCF?

Metro represents that it will, at some unspecified time, do wildlife studies, but only for amphibians, birds and fish, not

mammals. (Access Plan, pp. 14-5). To make matters worse, Metro plans to build its trails bathrooms, benches parking and picnic areas before completing any of the minimal wildlife studies it says it will do. To compound things even further, as stated above, Metro has disturbed the elk and no doubt numerous other species so that it may be years before they resume anything resembling their normal pattern of occupancy in the BCF. And a true baseline of what is in the BCF established.

At a stakeholders meeting in the fall of 2016 one of Metro's planners claimed that Metro conducted a survey of elk in the MCF and BCF. That claim too was false. (Appendix E).

### *Endangered Anadromous Fish*

As discussed earlier endangered and threatened anadromous fish are present in the BCF. Also the BCF is important to endangered fish that use BB. Unfortunately Metro's statements about the presence of endangered anadromous fish in BCF follow a

pattern similar to that they have made concerning elk. Metro no longer says what it said in the SCP that the Coho, winter steelhead and juvenile Chinook have been observed in the BCF. (SCP, pp.14-5). Instead Metro now claims in the Access Plan that “There is no *record* of fish use in Burlington Creek or Ennis Creek although it is *possible* that native fish use the lower reaches with less steep gradients.” (Access Plan, p.16) (emphasis added).

What does Metro really believe? Is the word “record” important? Of course if Metro refuses to do a study, and none has previously been done for Burlington Creek, then there is no record. That begs the question of whether there are anadromous fish present. Was the shift in Metro’s view from anadromous fish “almost certainly use Burlington Creek” to no they don’t, made before or after Metro made the decision to convert two thirds of the BCF into a mountain biking dominated park? We may never truly know.

*The “multi-use trails” fallacy.*



With reference to the BCF Metro asserts that “Low levels of access are anticipated for the vast majority of the natural area.” (Access Plan, p. 2). This statement is true when the four forests covered by the Access Plan are taken as a whole. For the present no trails are planned for the Ennis Creek and Abbey Creek Forests, while relatively few are planned for the MCF. On the other hand, mountain bikers will give the trails planned for the BCF an enormous amount of use. It is a false statement that the “multi-use,” mountain biking trails Metro proposes for the BCF will be lightly used. (Access Plan, p. 2). Metro acknowledges this in its Park Funding Application. Indeed the great demand for mountain biking trails is one of the reasons it puts forward for asking for funding. (Exh. 2, p. 14).

There are some 2,000 miles of mountain biking trails in Oregon attesting to mountain biking’s popularity. Of these trails only some 115 miles are within 50 miles of Portland and

only 42 miles within the City of Portland. Twenty-eight miles of these trails are in Forest Park.

The conduct of some mountain bikers has not helped their effort to expand mountain biking trails in the Portland Metro area. For example, Portland has excluded mountain bikers from River View site because of the bikers' destructive conduct there. In Forest Park mountain biker destructive conduct included forging illegal trails, cutting down trees and creating features appealing to mountain bikers, but detrimental to habitat. (Exhs. 22 and 23).

The Portland Metro area has half the state's population. Metro's assertion that low levels of mountain biker use is what is to be expected is absurd on its face. Indeed, the mountain bike organization that Metro brought to BCF and on which it intends to rely for mountain biking trail design expertise, the International Mountain Bicycling Association (IMBA), sent a memo concerning the BCF to Metro's Parks Planner and

principal Parks Designer in November 2015, well before the Access Plan was presented to the Metro Council for vote in April 2017.) The IMBA memo stated the obvious in its first point of its fifteen point memo:

Because of the lack of mountain biking trails in the Portland Metro area it is predicted that the site will see heavy year-round use by cyclists. (Exh.16).

What is also obvious, and what the memo did not say is that hiker use of multi-use trails will be light because hikers will avoid those trails for safety reasons. Instead, point 1 of the memo continued:

Conversely, as hikers have a wide variety of opportunities, including varying degrees of difficulty and distance, it is predicted that most pedestrian use will come from neighbors.<sup>28</sup> (Exh. 16).

The risk to hikers is clear. Despite Metro's labeling all the trails intended for the BCF as multi-use, hikers will, with good reason, avoid using them because of the risk of injury and death. (Appendix D). The threat to hikers is compounded

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<sup>28</sup> Having a mountain biking group consulting on trail design has a certain "fox in the henhouse" flavor to it.

because Metro' plans are for the narrow trails attractive to mountain bikers, which do not leave a lot of room for hikers to jump out of the way. In its latest BCF trails map dated December 2017, which adds another 6.7 miles of trails, at the most two miles of the new trails will be four feet wide with at least 3.7 miles of the additional trails proposed to be 30' wide and smaller. (2<sup>nd</sup> Permit Submissions, Exh. 22, p. 2). As noted earlier in this memo, according to Metro's own *Green Trails* manual multi-use hiking and mountain biking trails should be 4' wide with some passing zones 10' wide.

There has been much debate in the press all across the country concerning the conflict between bikers and hikers. The essence of the conflict is that hikers retreat to natural areas to escape the speed and mechanization of modern life. Mountain bikers introduce to these areas what others seek refuge from. The mountain bikers arguments are: (1) most of them are responsible and that it is a few bad apples that have given them

a bad name, (2) the deserve to enjoy nature in their own special way, (3) with proper design and construction multi-use trails are safe for all to use, (4) hikers have a responsibility to be more alert and to watch out for bikers, (5) hikers have lots of trails and mountain bikers do not, and that is unfair, (6) mountain biking is a great way to combat the obesity epidemic, (7) mountain biking gets more people out into nature, especially the young, who therefore gain a greater appreciation of the natural environment, and lastly, (8) hikers are as destructive to wildlife and their habitat as mountain bikers.

Mountain biking has grown in popularity over the last decade or so and research on this last point is in its relatively early stages. Beyond arguing that the science is inconclusive Metro is silent on point #8.<sup>29</sup> But what cannot be disputed is that mountain bikes are three to five times faster, than hikers.

Bikers come up on wildlife far more suddenly evoking a far

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<sup>29</sup> At least on scientist thinks the question is not up for debate and gives persuasive reasons why mountain biking is more harmful to the environment than hiking. (Exh. 23).

greater and more detrimental startle response. This point will be discussed more fully in this memo when the science is addressed.

Of all the arguments mountain bikers make, only number 3 has any validity. This is because it is possible to build trails wide enough so that hikers do not have to leap out of the way to avoid injury and occasionally death. But wider multi-use trails, essentially roads, to accommodate hiker safety triggers increased environmental damage, especially in areas as steep as the BCF.

Metro admits, logging roads “are a significant source of sediment... Sediment harms water quality and degrades amphibian and fish habitat.” (Access Plan, p 13). The difference between a small road and a logging road is a matter of degree, not kind. Both are sediment sources: the wider they are the more significant they are in terms of environmental degradation, not just from sediment as will be discussed in the

Science portion of this memo, but from the reduction of fauna and overhead tree canopy. Trails should be viewed as mini-roads. They are especially a problem when stacked in multiple tiers running very close together paralleled as all versions of Metro's plan for BCF do and again, which Metro's own trail manual recommends against. (Access Plan, p. 28, Exh. 4, pp. 35, 53 ). It should be noted that the IMBA recommends that the "steeper the side-slope, the wider the trail" should be, the exact opposite of the width trails should be in order to keep the bed of the trail as far from the fragipan as possible. (Exh.16, point 13).

The rest of the mountain biker arguments are simply self-serving. Under a simple utility of the risk versus the gravity of the harm analysis they fail from both the aspect of personal safety and environmental impact. As far as fair access to nature is concerned, no one says that bikers should be excluded from

the most democratic form of exercise, walking, like the much less vociferous rest of the probably 99% of the population.

Metro's inviting the IMBA to the BCF in 2015 and relying on its advice has a certain undesirable "fox in the chicken coop" feel to it. Their memo recommends that "sustainable single track should be used to get users around the site." (point four of memo). Single track is the preferred mountain biker trail type. (Exh. 2, p. 16).

The IMBA also weighs in on social policy and recognizes that mountain biking use will be heavy because mountain bikers have so few venues close-in to Portland, while hikers have far more opportunities. Their memo notes (Exh. 16, point 8) that "Hiking trails should be geared toward neighborhood use...", given the multitude of other opportunities for hikers nearby.<sup>30</sup> Whatever the source of the advice Metro is relying on

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<sup>30</sup> How is a trail designed for neighborhood use? What exactly does this mean? Do the neighbors hike differently than others?



it has chosen to design the trails for mountain biking despite Metro's claim that they are multi-use.

*Metro's false claim of equity*

Metro pays lip service to the concept of "equity." Instead of serving the underserved, such as people of color and lower income groups generally, the Metro's will do just the opposite.

There are two major problems with Metro's equity claim. The first is that there is no public transportation to either the BCF or MCF. The bus turns onto Sauvies Island, some 4-5 miles from BCF and even further from MCF, which is up a very steep hill from Highway 30, Newberry Road. Newberry has been closed for a good year and will be closed well into 2018.

Landslide activity has, as it has in past years, eliminated a lot of the roadbed. But more importantly, mountain biking is not a poor persons' sport like basketball, baseball or running.

A call to any bicycle shop, such as Bike Gallery or River City Bikes, in Portland will show that to obtain the basics

needed for mid-level equipment and assorted necessities costs about \$1,370. This includes a mountain bike for \$1,000, shoes, generally in excess of \$100, a “camel pack” for \$50 to carry water carry water on the bikers back since the jostling of mountain biking dislodges water bottles carried on a bike, cleats, \$100, and a jersey and shorts about another \$100 or so dollars, as well as a helmet for \$60, for a total of about \$1,370.<sup>31</sup> For a single person making even \$15 per hour with a gross of \$2,580 per month, mountain biking is out of reach. Even at a wage of \$20 per hour, or a gross of \$3,440 per month outfitting for the sport is comparable to the price of a poor person’s car, if they could scrape together the money to get one.<sup>32</sup>

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<sup>31</sup> Mountain biking shoes, as opposed for road biking, are different because mountain bikers need to be able to walk their bikes over obstacles and difficult terrain. Used bikes may be available on Craigslist for less, but other items are less likely to be available used. Bike Gallery’s phone number is: 503-222-3821. River City Bikes’ number is: 503-233-5973.

<sup>32</sup> There a 4.3 weeks in a month for a total of 172 work hour for someone with a full time, forty-hour per week job.

Mountain biking is a sport dominated mostly by vigorous white men with disposable income. (Exh. A). Metro's equity claims is weak, as is Metro's claim that getting youth into nature is necessary to make them environmentally conscious.

The obvious effects of global warming are in the media almost every day. The more removed in age people are from the baby boomer generation the more resentful they are of that generations advantages. They feel older generations have left them with a legacy of a warming planet, stagnant wages and higher living expenses for everything from higher education, to health care, to rent and home prices, while boomers have had the advantages of higher real wages, lower health, housing and education expenses. Even if it could be done, getting young, poor people on a mountain bike will not make them any more environmentally conscious.

*The Corridors*

At this point doubts about what Metro claims its plan is versus what the reality of its plan is, should be coming into sharp focus. Metro says that it acquired the property in the North Tualatins in order to “keep important wildlife and riparian corridors intact.” As Metro acknowledges these are indeed “special places.” (Access Plan, pp. p. iii and 4). As can be seen from Exh. 1, one does not have to be a scientist to understand what people mean when they speak of “the corridor to Forest Park.” Metro is well aware of the biodiversity importance of “the upland forests and streams that wildlife depend on for connections between Forest Park and the Coast Range.” (Access Plan, pp. iii and 4).

But, consistent with its true aim, to establish a mountain bike park close in to Portland regardless of the environmental costs, Metro, attempts to diminish the importance of the corridor stating that “Because there is no agreed upon standard for a wildlife corridor the planning effort relies on

accepted conservation principals that have been developed by researchers in the field of conservation science.” (Access Plan, p. 31).

As will be seen in the Science portion of this memo the problem, just like so many things that Metro claims it is doing, is that it is not following accepted conservation principals regarding the BCF and its importance as a forest in the narrow choke point in the Forest Park/ Coast Range corridor. Nor does Metro have anything to say about the corridors within the BCF itself such as those that the Western Pond Turtle and the Red Legged Frogs use in their annual migrations from the BCF to the BB wetlands and vice versa. This is all despite Metro having an abundance of knowledge about the critical importance of wildlife corridors, as shown in its publication, *“Wildlife corridors and permeability-a literature review”* (2010) (Exh. 15).

*Northern Red-Legged Frog Western Pond Turtle, Bald Eagle  
and sensitive an endangered species*

Metro knows that the proposed Burlington Creek Forest trails run through the habitat of a state listed species of great concern, the Northern Red-legged frog, that the BCF is used by listed species, and adjoins the Ancient Forest, an approximately 40 acre old growth forest that is a Bald Eagle roosting site.

Metro admits it has not done little in terms of investigating what wildlife is present in the BCF and MCF, but claims there is plenty of research about “Pacific Northwest forest habitats and the wildlife that use them” and therefore Metro has not done an ecological assessment and inventory. (Access Plan, p.16).

Metro has provided a “brief summary of known information about wildlife in the North Tualatin Mountains.” But, what Metro claims to know is based on non-specific, anecdotal reports from “staff, visitors and neighbors.” (Access Plan, p. 15).

Metro's range of statements suggest two things. The first is that Metro is guessing at what wildlife is present in BCF and MCF because it does not know, or secondly that Metro has an understanding of what is there, but chooses not to do an inventory especially in BCF, because it would document the rich diversity of the BCF, including the presence of listed species. This second scenario appears more likely.

Once again, Metro ignores its own advice. Its *Green Trails* manual (Exh. 4pp.20-32) advises that before building trails the wildlife should be inventoried, especially for listed species. (Exh. 4, pp. 20-32). *Green Trails* also advises that near Bald Eagle roosting sites to "keep activity and noise levels to a minimum." (Exh. 4, p.40). The Old Growth preserve connected to the Forest Park Conservancy trail into the old growth. Nevertheless, Metro calls for another access trail right to the edge this sensitive area. (2<sup>nd</sup> Permit Submissions, Exh. 22, p. 2,).

## **Science**

This section begins with general principles derived primarily from Metro's Ecology (Exh. 25) and Corridors Reviews (Exh. 15) supplemented from time to time with other sources. It thereafter proceeds with more specifics as they pertain to the BCF and MCF. There will be minimal discussion about erosion as that has already been covered, except to note that sediment does not just have deleterious effects on spawning beds, but it also clogs fish gills leading to population decline. (Exh. 25, p. 29).

While it is true that all human activity disturbs wildlife and habitat to some degree, Goal 5 is not aimed at preventing all disturbances. Rather, a balancing is required to accommodate human activity where appropriate. When the proposed human activity tips too far against the natural values of Goal 5, however, it requires the activity to be modified or in some cases disallowed altogether.



Based on scientific principals that Metro has provided in its literature reviews alone there is little question that Metro's Access Plan, and all versions of its BCF trails map plans tip too far against water, wildlife and habitat. If the reader has not yet been convinced that Metro's plans, certainly for the BCF, and to a lesser extent the MCF, elevate recreation over water, wildlife and habitat conservation contrary to Goal 5's mandate, this section of the memo will remove lingering doubts

Metro states in its Access Plan that "Protecting and enhancing wildlife habitat and water quality are central to Metro's work and the goals of this project. Using the best available science as a guide the project will provide new public access in a way that maintains the sites' core ecological function." (Access Plan, p. 25). As will be seen from an examination of what Metro has said is the best science, Metro fails to fulfill its promise. Contrary to Metro's claim, its plans,

especially for the BCF, are destruction and not preservation of water, wildlife and habitat for two thirds of it.

### *General principles*

Habitat fragmentation refers the process of dividing large habitat into multiple smaller, increasingly disconnected patches. (Exh.25, p. 29). Fragmentation is a major cause of wildlife decline and extinction, second, perhaps only to the havoc of invasive species, which is augmented by fragmentation and is a threat to ecosystems the world over (Exh. 15, p.18). Unfortunately, habitat loss is not stagnant and can increase over time as species are extirpated for various reasons, including fragmentation. (Exh. 25 p. 29)

The fragmenting effect of trails themselves in the physical sense can be minimal for some species because they have little trouble crossing trails and in some instances use them themselves. However, fragmentation involves much more. It occurs as a result of ecological disruption zones and edge

effects, as well as animals' anti-predator avoidance behavior, and not just the physical space taken up by trails. These problems arise with all trails even those that are fairly narrow such as the single track Metro is advocating in its Access Plan. Multi-use trails, such as those proposed in all Metro's trails maps produced thus far for the BCF tend to become wider as users step off the trail to allow another user type to pass by, creating even greater edge effects. (Exh. 25, p. 31).

As habitat is physically divided the edges of each patch are altered (edge effect) causing changes in wind, moisture and light. (Exh. 25, p. 29). The actual disruption caused by trail width may not be significant as a physical barrier for many species, but the ecological disturbance zones on either side of a trail are substantial. Edge effects are both vertical and horizontal. (Exh. 25, pp. 29-30). They include shrub and other ground cover loss, canopy loss, the loss of invertebrates, a primary food source, as a result of the physical space taken by

a trail, but also caused by the altering of temperature, light, which affects photosynthesis, and other factors extending on either side of a trail altering the microclimate. ( Exh. 15 p. 7, Exh 25, p.26 ).

Various negative impacts have negative cascading effects. In addition to edge effects altering microclimates, trail avoidance, another type of anti-predator response, contributes to the deterioration of habitat. Avoidance zones can result in harm as significant as the physical fragmentation, ecological disruption zones and the edge effects trails cause. (Exh. 25, p.31) For instance large carnivores avoid trails. (Exh. 25 p. 68-9, 73). Large carnivores are referred to as “apex species” because of their disproportionate effect on ecosystems. ( Wxh. 25,. P. 26, fn. 4). Both the MCF and BCF are used by bears and cougars, Oregon’s largest predators. (Appendix E ).

The absence of large carnivores can lead to increased deer and elk shrub herbivory resulting in the loss of normal

food sources resulting further, for instance, in fewer songbirds. (Exh. 25, p. 26). The reduction in birds affects seed dispersal and pollination. (Exh 15, p.5). The disappearance of large predators results in mesopredator release, the increase in smaller predators such as raccoons, foxes and house cats. (Exh. 25, p. 67). Mesopredator release in turn leads to greater predation of small mammals, reptiles, birds and bird nests. (Exh. 25, p. 67).

Invasive species are a leading cause of wildlife decline and extinction. (Exh. 25 p. 34). Just one invasive species, such as ivy or garlic mustard, invasives found in the Tualatin Mountains, can cause a significant degradation of habitat. (Exh. 25, p.34). Garlic mustard, a shade loving invasive, tends to encroach well into undisturbed habitat with significant habitat altering consequences. (Exh 25. p.34). Multi-use trails, like those proposed for both the BCF and MCF, have more invasive

species cover than single use trails, because each use distributes seeds in different ways. (Exh. 25 pp. 35, 37).

Trails spread pathogens, are key vectors for invasive species, and give predators easier access to numerous species including songbirds. ( Exh. 25. p. 34, 59 and Exh 15, p.9).

Invasive species can cause a forty-meter zone of influence on either side of a trail, plus the trail itself, although narrower zones are more common. (Exh. 25, p. 34). Additionally, invasive species eradication is expensive. (Exh. 25 p. 34)

The loss of biodiversity from edge effects and other alterations of the natural scheme resulting from trails and their use brings on a decline in plant production, lower resistance to drought, disruption of pest and disease cycles and other processes such as reducing the regeneration of nitrogen levels in soils. (Exh. 25, p. 26, and Exh. 15, p.9). The effects are long lasting. For instance, the City of Portland's ecologists estimated that it would take up to fifteen years of ongoing restoration for

the habitat to fully recover from mountain biker inflicted damage from their building unauthorized trails, including damming a stream, cutting down trees, and other alterations such as the construction of the jumps and dips that are attractive to mountain bikers. (Exh. 25, p. 19).

Because even narrow trails cause edge effects, unauthorized trails can greatly impact the total amount of edge effect. (Exh. 25, p. 29). It is not uncommon to see unauthorized trails comprising 50% of all trails in natural areas. (Exh. 25, p.18-9). Unauthorized trails are not limited to visitors wanting to explore new areas, whether they are hikers, bikers or other users, but also include bathroom oriented trails and those from private residences. (Exh. 25, p. 19). Because extensive unauthorized trails are so common after a natural area has been opened up by authorized trails, it must be considered that the environmental impact of the new trails proposed, up to 7 miles in the BCF, and 1.8 miles in the MCF, will be a good deal

greater than the total of formal trails that Metro's plans call for. (Access Plan, pp. 28-9, Exh. 2, p. 24).

The effects on wildlife are conceptually similar to the traditional definitions of edge effects and physical habitat fragmentation. There is a zone of influence around trails that alters the distribution and abundance of wildlife and can also cause sensitive wildlife, and not just large carnivores, to vacate an area altogether, effectively fragmenting the habitat in this way. (Exh. 25, p.31). Animal avoidance of an area, because of human trail use, is an anti-predator response. The zones of avoidance that trails and their use create are much larger than their edge effects (Exh. 25, p. 38). Nevertheless, physical fragmentation, especially for smaller animals cannot be overlooked.

While there are insufficient studies to assess amphibian crush mortality on trails, it obviously occurs. (Exh. 25, p. 55). Amphibians and turtles are less mobile. (Exh. 25, p. 56). It is



obvious that the speed of runners and the speed and constant connection of bike tires with trail surfaces makes mountain biking especially, a greater risk for these species than hiking. Reptiles are particularly vulnerable to fast approach. (Exh. 25, p. 55). Additionally, amphibians and reptiles can get caught in tire tracks and be unable to escape in time once they become alerted to an oncoming bike. (Exh. 26).

Across multiple mammal and bird species pregnant females and those with young have the greatest anti-predator responses. Large animals and larger groups of animals exhibit a greater predator response than smaller animals and smaller groups. (Exh. 25, p. 45, 47.). Prey species have the greatest fear of people. (Exh. 25, p. 52). Frogs are especially sensitive to recreational disturbance, and frog abundance is lower near recreation areas. (Exh. 25, p. 54-5). Across the United States it is believed that the alteration of turtle populations so that males dominate them is a result of the crush deaths of females

because they travel further than males in order to nest. (WExh. 25, p. 55).

Studies are not always accurate because species suffering the strongest impacts are naturally rare or already have removed themselves from disturbed sites. Additionally, what appears to be habituation may often be anti-predator response as when, for example, the necessity of obtaining food during the winter outweighs predator flight response. (Exh.,25, p. 52).

Two metrics measure anti-predator response triggered by human use. These metrics, alert distance, and flight initiation distance (FID) are well established for many species and will be discussed in more detail below. (Exh. 25, pp. 40, 90).<sup>33</sup>

Anti-predator responses stress animals. Wildlife biologists have found economic analogies and cost benefit analysis helpful in analyzing and explaining their findings. For instance it is helpful to view animals as having energy budgets.

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<sup>33</sup> FID for birds is sometimes referred to as “flush distance.” (Exh. 15, p. 16)

(Exh.25, p. 39-40). To the extent they use energy for foraging, resting, and nursing their young, they thrive. On the other hand, when energy is used to be on alert or to flee it is not devoted to positive behaviors.

Energy reserves can be reduced to dangerous levels. (Exh. 25, pp. 41, 44). Elk stressed in the early spring, for instance, when their energy levels are at annual low points, are vulnerable. Lacking sufficient reserves their immune systems can be compromised jeopardizing their survival. (Exh. 25, p. 39). The low point of energy reserves for many animals, such as elk, is also the time when humans want to get out doors after the winter months.

In terms of recreational use impacts, birds are the second most studied wildlife, after mammals. (Exh. 25, p. 56). The greater the use of trails the greater the anti-predator response is for many birds. (Exh.25, pp. 60-1). Large birds, such as herons and Bald Eagles flush more readily and have the

greatest FID. (Exh. 25, p. 56). Specialist birds, that is, those depending on specific habitats and food sources, are the most vulnerable to fragmentation. (Exh. 25 p. 58). Neo-tropical birds are specialists.<sup>34</sup> Their decline is significantly higher in fragmented habitat. (Exh. 25, p. 58, 61). Migration is energy intensive and the more disturbed migratory birds are, such as Neotropicals, the less fit they are for migration (Exh.25, p. 61).

Research on birds of prey is sparse, but studies recommend 400-meter non-disturbance zones and there is a finding of a 79% anti-predator response rate for Bald Eagles to pedestrians within 275 meters. Non-disturbance zones of 600 meters are recommended from nests. (Exh. 25, p. 64). There is scant evidence of birds of prey habituating to hikers and none showing habituation to bikers and equestrians. (Exh 25, p. 65). The Metro's plans will bring many more people to the Old

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<sup>34</sup> Neo-tropical birds are those that winter south of the Mexican border and breed in the Northwest. (Exh. corr p. 25 ).

Growth Forest area owned by the Forest Park Conservancy, which is a well know Bald Eagle roosting area. (Exh. 25, p.28).

Not surprisingly, higher numbers of trail users cause more negative environmental effects across the broad spectrum of wildlife from tiny invertebrates to large carnivores. (Exh. 25, p. 42). Even though it states the obvious, given Metro's meager effort to inventory the wildlife in the BCF and MCF prior to its planned construction of parks in these forests the following observation made by Metro's author of both the Ecology and Corridor Reviews' author, bears repeating:

[C]are should be taken interpreting results at disturbed sites without pre-disturbance or undisturbed controls because wildlife communities will already be altered from natural conditions. Another drawback to determining true costs of recreation on wildlife is the need for statistical significance to validate results: animals that are already rare will be excluded from the conservative approach to estimating effects of recreation on wildlife. (Exh. 25, p. 39).

*Some specifics from Metro's literature reviews as they pertain to  
the BCF and MCF*

In addition to the application of the above general principles to the BCF and MCF, there are some notable findings Metro points to in the literature that have direct implications for the BCF especially, and also the MCF. The first regards the concept of core habitat.

Scientists have measured core habitat for a number of species. Metro's Access Plan defines core habitat as patches 30 acres or larger. ( Access Plan, p. iii). While Metro's use of the word "larger" saves its statement from being categorically false, in the context of what the Access Plan proposes, it is misleading.

The Access Plan trail map as well as all succeeding trail maps Metro has produced cuts two thirds of the BCF into pieces far less than thirty acres. In the 224 acre or so part of the BCF generally south of McNamee Road there will be only

one piece of the habitat perhaps as large as 12 acres.<sup>35</sup> Thirty acres is too small an area to qualify as habitat, except as the minimum needed to support only a limited number of species, and not the broad diversity of species that are present in the BCF and MCF. As recent credible research has shown many Oregon small mammals need a minimum of twenty-five acres or greater such as the Shrew Mole, Trowbridge's Shrew, the Northern Flying Squirrel, the White Footed Mouse, and the Oregon Vole. (Exh. 15, p. 9).

Metro's description of core habitat as 30 acres or larger is an admission that Metro is destroying the habitat there. The same thing applies to where Metro proposes trails located in the headwaters of McCarthy Creek in the MCF. For about seventy acres of the four hundred two acre MCF there will be no core habitat remaining even under Metro's limited rubric of thirty acres. (Access Plan, p. 29).

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<sup>35</sup> McNamee Road and railroad tracks already fragment the other third of the BCF, where Metro does not plan any trails. There the forest is in two pieces, one probably about 35 acres and the other perhaps 85 acres. (Access Plan, p. 28).

While the size of habitat matters, so does its shape. Long narrow pieces of habitat have more edges and, therefore, greater edge effects. (Exh. 15, pp.1, 7 ). While the fragmented habitat pieces that the Access Plan will create will be too small, their shape compounds that deficiency. Many of the intact areas remaining in the BCF if the Metro' plans are implemented will be long and narrow. (Access Plan, p. 28). The same applies to the trails proposed for the MCF (Access Plan, p. 29).

Areas greater than thirty acres are particularly important to our region's wildlife in forested habitats. (Exh.15, . p.22). Many species require much larger areas of habitat. (Exh. 15, p. 9). As Metro points out, the following are typical core habitat area requirements: 26.4 acres for some small mammals, 81 to 484 acres for many species of non-prey birds, 440 acres for elk as well as other species of non-prey birds. (Exh.15, p. 86 ).

By 2080 the projection is that temperature will increase from eight to twelve degrees Fahrenheit in the upper



Willamette Basin and it is believed the impacts on Lower Willamette Basin temperatures will be similar. (Exh. 15, p 19). Healthy, biologically diverse ecosystems will be better able to withstand climate change. (Exh. 15, p. 20). These need to be intact ecosystems represented by large areas of habitat. (Exh. 15., p.19). Existing habitat stressors, including fragmentation and invasive species encroachment, will likely worsen with climate change. (Exh. 15, p. 19). Climate change will trigger species migration and the need for connectivity must be anticipated as wildlife and plant species ranges shift, a transformation that is already apparent in birds. (Exh. 15, p. 19).

Large pieces of habitat are important to migrating animals, but also for the survival of animals that move intra-regionally as well. Numerous studies show large pieces of habitat are preferable as they host more species, are easier for

migrating animals to find, and reduce extinction risk. (Exh. 15, pp. 6, 8).

Gene flow is particularly important for small populations and for those isolated for long periods of time. Genetic isolation leads to increased concentration of inheritable disease and reduced ability to adapt. (Exh. 15, . p. 5). Isolation can lead to local or total extinction (Exh. 15, p.5). This is especially the case for frogs and salamanders. ( Exh. 15, p. 5). This is much more the case for these species and others who are limited in the distance they can travel. It is less so for birds, which can travel long distance to interact with others of their kind. (Exh. 15, p. 5). Wider corridors direct and increase animals' movement rates between larger areas of habitat (Exh. 15, p. 32).

Because elk are the iconic species of the North Tualatin Mountains, and the symbol of the area's connection to the wild, some of the scientific observations regarding elk will be

discussed next, irrespective of Metro's latest claim that elk hardly exist in the BCF. It is clear that Metro's Access Plan, which destroys habitat in two thirds of the BCF will entirely eliminate elk from the BCF.

Numerous studies show a long anti-predator response for deer and elk ranging from seventy-four to four hundred meters depending on the setting and user intensity. (Exh. 25, p. 65). Further, elk do not habituate to human activity. What might be claimed as evidence of habituation is in reality often anti-predator response activity. The predator shelter effect is well established in elk. They move out of hunting areas during the hunting season and otherwise shift to nocturnal activities in response to human activities. (Exh. 25, p. 73). Predator shelter effect is seen in the MCF. (Appendix E ). So, elk adaptation does not necessarily equate to habituation. Habituation implies a more or less benign coexistence with human activity where an animal does not experience deleterious stress.

As they pertain to the BCF and MCF, a few more established findings help illustrate some facets of elk's lack of habituation. Faster approaches are more disturbing and elicit stronger anti-predator responses including longer flight distances, and therefore, mountain biking is more disturbing to elk and other species than hiking is. (Exh. 25, p.71). For that same reason, rapid, silent approach, trail running is also more disturbing to elk than hiking. (Exh.25 , 41). But hiking activity is not benign. It too causes reduced elk births. (Exh. 25, p. 27). Conversation, more frequent in hiking than other trail use activities, is very disturbing to wildlife generally. (Exh. 25, p. 52). Simply put, higher levels of recreational use cause higher levels of disturbance reducing elk and other wildlife's productivity. (Exh. 25, p. 73).

The less fit an animal, the less likely it is to flee and animals experience stress without fleeing. (Exh. 25, p. 44). So, an elk's failure to flee, or its moving away from a disturbance at

less than a headlong run does not necessarily show it has become habituated to human activity. Moreover, long before an animal flees it has already spent energy being vigilant. (Exh. 25, p. 39)

Pregnant elk or groups of elk with young especially, show a greater reaction to recreational disturbance than other wildlife groups. Other species in general that are pregnant or with young have heightened reaction to disturbance. (Exh. 25, p. 41). Stress causes significant population effects over time. When stressed an animals' stress hormones are released and its heart rate increases. (Exh. 25, p. 39). It is well established that chronic stress reduces animal health and birth rates generally, including impairment of immune systems making them more susceptible to disease and infection. (Exh. 25, p. 39).

Automobiles trigger less anti-predator response in elk than does the presence of pedestrians and motorcyclists. (Exh.

25, p. 66). This is consistent with the well-documented fact that passing or stopping vehicles are less disturbing to wildlife in general than to people on foot. (Exh. 15, p.17). This may account for what some refer to as the occasional “elk jam” at the foot of the Tualatin Mountains on Cornelius Pass Road a half mile south of its intersection with NW Kaiser Road.

Motorists will sometimes slow down or pull off the road to see a herd of elk numbering twenty-five to forty or so animals grazing in a field at the edge of the forest 175 to 200 yards off the roadway.

Some proponents of the claim that elk in the North Tualatin Mountains are habituated to human activity have cited the “elk jam” as evidence of habituation, which it is not. Metro’s Access Plan also makes the claim, despite the scientific evidence to the contrary in its literature reviews, that elk in the North Tualatins are habituated to human activity. (Access Plan, p. 32). The elk jam is, instead, evidence of the fascination

and wonder that people have for the elk in these mountains. It is not evidence of habituation.

The Access Plan also claims, incorrectly, that elk frequently traverse heavily traveled roadways. ( Access Plan p.32 ). Roads have a predominantly negative effect on large animals. (Exh. 15,p.13). Elk do travel across roads in the North Tualatin Mountains from time to time, but not frequently. They especially do not frequently travel across heavily traveled roads such as Cornelius Pass, Skyline and Highway 30. When they do it is overwhelmingly at night. (Appendix E).Elk road crossings in the Tualatin Mountains during daylight are rare. (Appendix E). Nevertheless, despite scientific evidence overwhelmingly to the contrary in the Access Plan Metro makes the claim that the elk in the North Tualatin Mountains are well habituated to human activity, and that habitat fragmentation is not that much of a concern for them. ( Access Plan p. 32).

Unlike in the BCF, Metro does not dispute the presence of elk in the MCF, but gives them little consideration. What has been referred to earlier in this memo as the “elk nursery” can be seen on page 29 of the Access Plan.<sup>36</sup> It is the lightly shaded area just to the left of the words “McCarthy Creek” on the map, together with the adjacent forest. (Access Plan, p. 29). This light area consists of oak and meadow that extends somewhat onto to private land. Just above the elk nursery is a narrow strip of land shown by dotted lines. This strip continues to McNamee Road and is an easement Metro owns.

The MCF consists of 402 acres, but to the west and north of the MCF is fairly extensive private forestland as well as some pastureland. The forestland continues a long way almost to Highway 30 along the slope that descends down to McCarthy Creek as the creek progresses along Cornelius Pass Road. This

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<sup>36</sup> The phrase “elk nursery” is a shorthand way to describe the MCF calving and foraging area where cow elk give birth and then spend part of the spring raising their young. It is downslope from McNamee Road, but some of the private upslope landowners can see into this area. Elk and their calves are also seen on pasturelands to the west and northwest of NW Pauly Road. (Appendix E).



private land enlarges the natural area of which the MCF is a part, adding perhaps another five hundred acres, if not more, to the MCF habitat.(Appendix E).

Metro has temporarily backed off what it termed the McCarthy Creek viewpoint trail that it had planned to run through the elk nursery. (Access Plan., p. 29). That cancellation needs to be made permanent.

In addition to Metro's claims concerning elk habituation to human activity, Metro made a further astounding assertion, this time regarding the elk nursery. Metro stated :“The true extent of the impact of this trail on elk use at the meadow is unknown at this time.” ( Access Plan, p. 29). Based on the science Metro has provided in its literature reviews, and the fact that Metro has temporarily cancelled the trail through the elk nursery, Metro in fact has known well before publishing the Access Plan in April 2016 the devastation its proposed

viewpoint trail would cause the elk. There is a further problem with the remaining trails it proposes in the MCF.

They will be multi-use including mountain biking, which is particularly disturbing to elk. These trails are too close to the elk nursery. The northern most star on the map, which depicts a viewpoint, is only 400 meters from the meadow at the center of the elk nursery. The nursery itself is not just the meadow. It extends closer to the northern parts of the new trails Metro proposes because elk use the forested area surrounding the elk nursery as shelter from perceived threats.

Given what Metro says is the science on the topic, that is, that pregnant elk and elk with young are especially sensitive to human activity, and that the alert and FIDs for elk range up to four hundred meters, the northern most proposed trails are too close to the elk nursery.. Since much of the nursery is meadow with long site distances, and the elk involved are pregnant, and after calving, with young, it seems that the

greater distance point of the alert and FID range would apply. The further away an animal can see an approaching threat, the greater its response. Humans are generally larger compared to the predators native to the area, including cougars. Therefore, a strong anti-predator response is to be expected, especially from the cows pregnant or with young in the elk nursery. (Exh. 25, p. 46).

Science from Metro's literature reviews concerning amphibians and reptiles is helpful in further understanding why Metro's plans are so harmful. Metro has acknowledged the presence of the Northern Red-legged frog in the BCF. Also present in the BCF is the Western Pond turtle, a species that is listed as threatened in Oregon and endangered in Washington and is being petitioned for listing under the Environmental Species Act. (Exh. 27), Federal Register/Vol.80. No 69, April 0, 2015/Proposed Rules.

The effect of different user groups on amphibians is unclear because not enough studies have been done. (Exh. 15, p. 24). However, there are a number of things that can be said about trails and human activity as they relate to amphibians, as well as turtles. Trails are generally not physical barriers to most wildlife. It is their creation of edge effects, their acting as vectors for invasive species and pathogens, and their initiation of zones of wildlife avoidance, as discussed earlier, that are the more significant problems. But raised trails, such as might be built in damp areas to avoid erosion, present physical barriers for both turtles and frogs. (Ex.25, p.29). The effect of human recreational disturbance is well documented for FID and alert distance for these species. It ranges from one hundred twenty-five to two hundred thirty-six meters. (Exh.25, p. 92). Even on the low end of the scale this is significant.

Another finding is indicative of the difficulties turtles are facing. Across the United States turtle populations are

becoming more male dominated presumably because females travel greater distances to nest and suffer road mortality at a higher level. (Exh. 15, p. 13).

Decline is clearly the case for the Western Pond Turtle and the Western Painted Turtle. They are both listed as critical on ODFW's Sensitive Species list. (Exh. 15, p. 24). Recreational access is a key threat to the Western Pond turtle. (Exh. 25 p.55). They have dangerously restricted gene pools because of the isolation of populations. (Exh.15. 24) It is important to avoid disconnecting Western Pond Turtles from their upland nesting habitat. (Exh. 25 p. 55). Western Pond Turtle breeding migration is in the opposite direction from that of the Red-Legged frogs. They travel from ponds, such as those in the Burlington Bottoms, to upland areas to breed. There is no reason to believe that the same problems encountered by the Western Pond Turtle are not also encountered by the Western Painted Turtle.

Frogs are especially sensitive to recreational disturbance. They appear to be prone to sensitization, the opposite of habituation, the more they are disturbed. (Exh. 25, p. 54). It also appears that the more a given frog is disturbed, the longer it takes for the frog to return to pre-disturbance activities. (Exh. 25, p. 54). As a result, the findings that frog abundance is lower close to recreational activities are probably accurate, although there are not enough studies exist to state this definitively. (Exh. 25, p. 55).

The dramatic decline of amphibians worldwide is unquestioned. (Exh. 15, p. 23). The author of the Metro's literature reviews conducted a study in Gresham Oregon that drew significant results. She found three out of five native amphibian species had negative correlations with invasive species. (Exh. 25, p. 55).

The BCF in particular is habitat for the Northern Red-Legged frog, a state of Oregon designated species of great

concern. It is a pond breeding species. Harborton Frog Shuttle, a group of volunteers, transports Northern Red-Legged frogs across Highway 30 during fall and winter when they migrate from the BCF to the Burlington Bottoms. These volunteers do the same elsewhere along Highway 30 between Linnton and the BCF. Red-Legged frogs are also crushed by auto traffic on McNamee Road where it borders the BCF. (Appendix E ).

Metro's plans for the BCF will increase traffic on Highway 30 and on McNamee Road where the entrance to BCF is located further imperiling Red Legged Frogs and other small intra-regional migratory species. While amphibian deaths from road crossing is well documented, that for trail crush deaths is not. (Exh. 25, p. 55). However, based on the foregoing science the introduction of trails into Red-Legged frog habitat such as the BCF creates another obstacle that is significantly more than incidental to their survival, which is already at risk.

Amphibians and turtles are less mobile than other wildlife species. (Exh. 25, p. 56). Turtles are especially vulnerable to fast approaches, such as that of mountain bikers and perhaps runners. (Exh. 25, p. 55). Like amphibians turtles too have long FID and alert distances. The general scientific principal that chronic stress has negative effects on species generally is, of course, operative for turtles and frogs.

### *Stream Crossings: A Special Problem*

All stream crossings present erosion problems including bridges and culverts and not just fords at where people, bikes and horses, for instance, cross by directly by entering the stream itself. This occurs both during and after construction. It is not the traveling over the structure, a bridge, culvert or boardwalk, that is itself the problem, but more so the compaction of the trail and defoliation near the crossing and on either side of the crossing. (Exh. 25, p.27). Compaction and defoliation decreases water infiltration and creates more



runoff into streams. (Exh. 25,, p. 29). A Virginia stream crossing study of multi-use trails showed an erosion increase of 13 times greater than that of forested areas nearby. (Exh. 25,. p. 28). Stream crossings also decrease macroinvertebrate communities, an important food source (Exh. 25, p. 28).

Part of the larger problem is the sensitivity of riprarian areas. Stream crossings bring human activity into riprarian areas. Nearly half of all non-fish vertebrates in the Portland Metropolitan region use riprarian areas for breeding, feeding, moving and dispersing. Ninety per cent of all terrestrials use riprarian corridors to travel from one end of their range to the other. (Exh. 4, p. 31).

*Scientific Opinions Specific to the BCF and MCF*

Exhibits 26, 29 and 30, are opinions from wildlife scientists familiar with the BCF. Sue Beilke is a wildlife biologist who administers Burlington Bottoms for ODFW. She is the author of Burlington Bottoms Wildlife Mitigation Site

Five year Habitat Management Plan (2001) and a founding member of Harborton Frog Shuttle. Susan Barnes is the ODFW's West Regional Conservation Biologist. Charlotte Corkran is member of the Northwest Regional Research Institute, a non-profit located in Portland. Her latest book co-authored with Chris Thoms, is Amphibians of Oregon, Washington and British Columbia (2006).

All three opinions are specific to BCF and MCF. They reiterate many of the same principals discussed in Metro's Ecology and Corridors Reviews. They all draw the same conclusions. They all agree that before any construction is begun surveys of what wildlife are present in these forests should be conducted. They agree that the BCF and MCF are important for a wide variety of wildlife including elk, migratory songbirds and other animals, and for amphibians they are crucial. The creeks are especially important corridors for amphibians. They also agree that amphibians are in serious

decline in our region and world-wide. They further agree that the existing logging roads in the BCF and MCF are sufficient for human access and no new trails should be installed. In addition, biologist Barnes recommends (point 4 of her opinion) that existing trails and logging roads should be decommissioned “wherever possible.”

These scientists also agree that the steepness of the slopes in the BCF raise particular concerns for erosion. Charlotte Corkran noted anecdotal evidence that that amphibian are sometimes trapped in wheel ruts of bikes resulting in amphibian deaths while she has not seen any direct mortality to amphibians from hiking or equestrian use.

As Metro’s literature review author stated these problems are “making a strong argument for leaving some areas undisturbed.” Exh. 25, p. 66). The BCF and the MCF are among those areas that should remain undisturbed.