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Abstract: In May 2010 the proposed Bickham coal mine near the Pages River in the Upper Hunter region of Australia was formally rejected because of its potentially deleterious impacts on hydrology and the likely negative impacts on a valuable thoroughbred breeding region. In this paper we focus on the 'psychoterratic' mental states of topophilia and solastalgia and highlight how people's intimate personal relationships with the river and "the environment" were concealed through the formal assessment process. We argue that these relationships and the emotional states they sustain are critical, are at present little understood by geographers, that geography is well placed to develop and incorporate these understandings, and that the formal impact assessment system could be greatly improved by the incorporation of psychoterratic geographies.

Detailed response to the reviewers

The revised submission was accepted subject to minor amendments being made to the paper. These amendments included removing some theoretical and contextual material from the background, emphasizing stories where possible later in the text and drawing stronger links between psychoterratic geographies and the impact assessment process.

We have made the changes to the Introduction as required, deleted some other material to free up space in the paper, and have included greater emphasis on the stories of local people. We have also provided more material on the Bulga case, which we referred to in the earlier versions of the paper as upcoming, but has been a landmark case in the introduction of psychoterratic relations into the impact assessment process, albeit through a legal appeal. We also highlight the NSW government's response to this scenario.

Overall we believe that this is a much stronger paper and thank the referees and editors for their work in helping to improve it.

Psychoterratic geographies of the Upper Hunter region, Australia

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Highlights

- We identify the importance of emotion in environmental contexts
- We introduce and define a range of psychoterratic emotions
- We demonstrate how emotions can be incorporated into impact assessment
- We provide a vocabulary for intimate emotional relations with the earth
- We use this approach in a contest between coal mining and thoroughbred breeding

Psychoterratic geographies of the Upper Hunter region, Australia

Abstract

In May 2010 the proposed Bickham coal mine near the Pages River in the Upper Hunter region of Australia was formally rejected because of its potentially deleterious impacts on hydrology and the likely negative impacts on a valuable thoroughbred breeding region. In this paper we focus on the ‘psychoterratic’ mental states of topophilia and solastalgia and highlight how people’s intimate personal relationships with the river and “the environment” were concealed through the formal assessment process. We argue that these relationships and the emotional states they sustain are critical, are at present little understood by geographers, that geography is well placed to develop and incorporate these understandings, and that the formal impact assessment system could be greatly improved by the incorporation of psychoterratic geographies.

Keywords

Psychoterratic, solastalgia, topophilia, mining, thoroughbreds, water

1. Introduction

Anderson and Smith lamented in 2001 that “neither the vocabulary nor the concept of emotional geographies appear to have a place in the return to ‘relevance’”, despite their preceding observation that there is a “glaring obvious, yet intractable silencing, of emotion in both social research and public life” (Anderson and Smith, 2001, 7). Despite

substantial geographical research in emotional geographies since 2001 (see Pile, 2010), there has also been continued recognition of the lack of integration of emotions within social research and public life (Clark and Clark, 2012). While there has been work undertaken in geography (Stratford, 2009) and outside of geography (Tschakert and Tutu, 2010; McNamara and Westoby, 2011; Cordial, et al., 2012), there is still inadequate integration of emotions and environmental understandings. A recent article by Kearns and Collins (2012) investigating emotional attachment to the Ngunguru coast in Northland, New Zealand resonates with our work in the Upper Hunter region of New South Wales (NSW). Kearns and Collins (2012) focus on the positive emotional bond between people and familiar localities, particularly noting the influence of length of residence and the likelihood of intense emotional responses when a familiar place is threatened by unwanted change.

Unwanted change has been both a threat and a material reality for many residents of the Upper Hunter region of Australia. There have been a number of conflicts between various industries competing for space, air quality, water, identity and labour in the region, most notably in the 1990s between the coal mining industry and viticulture over the establishment of the Bengalla coal mine near Muswellbrook, which commenced operations in 1999 (McManus, 2008a). The growth of the thoroughbred breeding industry and the coal mining industry meant that, inevitably, there would come a time when they would be in direct conflict with each other. That time came in 2002, with the proposed establishment of a coal mine in what is now the Upper Hunter Shire. The local conflict around the proposed Bickham coal mine was part of a larger conflict about the biophysical and cultural construction and identity of the local government area and a

region that includes viticulture, coal mining, horse studs, power stations and competing identity discourses such as the adjacent Muswellbrook Shire's former motto, 'bursting with energy', as a 'moonscape' or as nature nurturing a crop of thoroughbred champions.

The proposed site for the Bickham Coal Mine was located approximately 12 kilometres south-east of Murrurundi and 25 kilometres north of Scone. It is about 150 metres from the Pages River and upstream of some of the most famous thoroughbred studs in Australia. The coal mine proposal was formally rejected because of its potentially deleterious impacts on the river's hydrology. While this is the official reason, we suggest that the Bickham coal mine proposal was stopped because it was a relatively small, isolated and environmentally risky operation located upstream from thoroughbred breeding farms that are owned by some of the most powerful and wealthy people in Australia.

Formal environmental assessment mechanisms generate formal scientific responses, because these are legally required and are considered by many people in society to be the most acceptable form of evaluative discourse. The Bickham conflict generated an enormous amount of scientifically-based impact assessment work. The mine proponents noted, correctly, that they were required to undertake far more stringent environmental studies, particularly hydrological studies, than any other coal mining proposal had done up until that time. Over the next eight years, the conflict meandered through various phases and processes, until on 14 May 2010 the then Premier of New South Wales (NSW), Kristina Keneally, announced: "The [Bickham] mine is simply not compatible with the unique rural characteristics of this locality, including the horse-breeding industry" (Kirkwood and Smee, 2010, 1 and 4). A key aspect of the final decision was

that opponents of the mine were able to fund scientific hydrological studies that fundamentally questioned the soundness of the science submitted by the consultants hired by the mine proponent (Connor et al., 2008).

In addition to the water science issues, it can be argued that the proposed Bickham coal mine conflict was not simply a scientific debate about the impact of a development proposal on a receiving environment, and the subsequent impacts downstream. We argue, as did the Premier of NSW (above), that it was also about personal and collective relationships with “the environment” – understood as topophilia (Tuan, 1974) and solastalgia (Albrecht 2005, 2006, 2010, 2012; Albrecht et al., 2007). Both solastalgia and topophilia are concepts that we see as examples of ‘psychoterratic’ or earth-related mental health states (Albrecht et al., 2007, Albrecht 2012).

In the following section we explore the theoretical psychoterratic concepts employed in this paper; topophilia and solastalgia and their relationship to the field of impact assessment. The third part of the paper introduces the Upper Hunter region, with a focus on the two main industries of coal mining and thoroughbred breeding. We explore, in particular, conflicts between these industries as they compete for limited space, resources such as water, the creation and evolution of the region’s image, the public perception of their industries and for political influence. In the fourth part of this paper we introduce a specific conflict – the proposed Bickham coal mine. In the fifth section of this paper we highlight the limitations of relying on formal impact assessment methods in environmental conflicts as they emphasise scientific information, economic and demographic social data into a formal process that presents a limited interpretation of a landscape. In doing so, certain discourses are favoured while others are marginalized.

This situation results in alternative tactics being employed in the debate, such as the provision of high expense, specialist, empirically derived data used to describe the issue, while more qualitative aspects of the issue remain concealed and ignored. The paper concludes with a call for considering the inclusion of concepts such as solastalgia and topophilia both within and alongside improved approaches to formal environmental assessment processes and specifically, the social impact assessment (SIA) component of systematically integrated impact assessment. We acknowledge the challenges in attempting to do so, but believe this endeavour is important because otherwise the impact narratives that are told will become, increasingly, channeled into the formal, scientific language that distances people from the very environments with which they currently feel both connected and disconnected. If the level of international social protest concerning environmental impacts on people such as extreme weather events (drought and hurricanes), mountain top removal for coal, large open cuts and the fracking of coal seams to extract gas, is any indication, public pressure to include the psychoterratic in SIA will become compelling in the near future.

2. Psychoterratic Geographies: Topophilia, Solastalgia and Impact Assessment

Psychoterratic geographies refer to mental health (psyche) states that are related to place and the condition of the earth (terra). Broadly speaking, we can define both positive and negative psychoterratic states within the psychoterratic typology (Albrecht 2012). The concept is based on the two-way connections between human health and environmental conditions. Solastalgia and topophilia, as demonstrated below in the review, have been in the literature now for some time. What is new in this paper,

however, is the application of these ideas in relation to each other, and to other forms of assessment such as formal impact assessment processes that tend to ignore or marginalize emotive and qualitative information, but particularly psychoterratic states.

2.1 Topophilia

The concept of topophilia was first used by the poet W.H. Auden in 1947 to describe the attention given to the love of particular and peculiar places within the built environment as revealed in the poetry of John Betjeman (Hauser, 2007). In a much more widely understood and used interpretation of topophilia, geographer Yi-Fu Tuan (1974, 4) defined topophilia as “the affective bond between people and place or setting”. This bond, for Tuan (1974, 4) was “diffuse as concept; vivid and concrete as personal experience”. Tuan argued that:

Topophilia takes many forms and varies greatly in emotional range and intensity. It is a start to describe what they are: fleeting visual pleasure; the sensual delight of physical contact; the fondness for place because it is familiar, because it is home and incarnates the past, because it evokes pride of ownership or of creation; joy in things because of animal health and vitality. (Tuan, 1974, 247)

Topophilia, as a love of environment, expresses in one concept, a collection of vague terms such as “joy”, “at home” and “fondness” that were previously used to connote positive connections to place. However, the positive love of landscape and place is typically a more intense feeling/emotion for Indigenous people and people such as rural and remote folk who live closely to the land/soil. No doubt, many traditional peoples have in their own languages powerful expressions that connect positive emotions to place. When a much loved landscape is desolated, an equally powerful negative

feeling/emotion is likely to be experienced. It is this precise experience that solastalgia in the English language describes.

2.2 Solastalgia

The concept of solastalgia was developed to give greater conceptual clarity to a feeling of desolation or melancholia about the emplaced and lived experience of the chronic deterioration of a loved home environment (Albrecht 2005, 2006, 2010, 2012). Solastalgia is experienced as an existential melancholia at the negatively perceived transformation (desolation) of a loved 'home' environment. It is a form of 'homesickness' like that experienced with traditionally defined nostalgia, except that the victim has not left their home or home environment. In this sense, solastalgia generates an emplaced melancholia similar to that produced by disemplaced traditionally defined nostalgia.

The concept of solastalgia was applied initially to the lived experience of the negative transformation of the biophysical environment, both natural and constructed. Open pit coal mining, other forms of mining, urbanization, gentrification, toxic pollution of places and, now, global warming and attendant climate extremes such as drought, have been identified as factors that potentially drive people into solastalgie despair (Albrecht 2005, Albrecht et al., 2007). It is typically the distress manifest at the chronic change to the external, physical environment that is the focus of solastalgia. In a study of a coal mining impact community (Singleton) and one not directly impacted by coal mining (Dungog) in the Hunter Valley, Higginbotham et al. (2006) found that in the nine questions relating to solastalgia as part of a larger survey about environmental distress, higher levels of

solastalgia were evident on eight questions in the Singleton location. The one question where solastalgia was more evident in Dungog was when respondents were asked to consider being forced to leave their property – a function of higher levels of topophilia in a less disturbed environment, greater levels of ownership and longer family affiliations with the property.

2.3 Impact Assessment

The original premise of impact assessment was to identify potential problems, and opportunities, before a proposed development was undertaken. It is a rational, managerial approach to environmental issues. Possible conflict is channeled into a process of research (including public consultation), the preparation of a statement of possible impacts, public consultation post the release of the statement, the receiving of written submissions in response to the report and then a response to the submissions before a decision is undertaken (Elliot and Thomas, 2009). In this sense, Impact Assessments are not traditional science (although they use science) because they do not produce peer reviewed research and the data cannot be replicated according to conventional notions of what is counted as science. Rather, they are used to predict impacts, not test hypotheses and refine explanations. The problems with constructing impact assessments as ‘scientific’ include concealing values and politics that are inherent in decision making, and rendering other discourses invisible. It is proponent driven and paid, which means that the science is likely to be biased in favour of the development going ahead (Beattie, 1995; Elliott and Thomas, 2009). If private consultants come to a finding that is against a proposed development, then their future in the field is likely to be at risk as no developer would be likely to hire them.

Impact assessment (particularly the traditional form of environmental impact assessment) is a process mandated by law, as to when it needs to occur and how it should

occur, although as we noted previously it is proponent driven (and funded) and this is often perceived to favour the proponent. Whilst this is potentially very limiting in terms of the conception of the environment and the narratives that are told, and the ways they are told, impact assessment is also important in ensuring that crucial considerations such as Aboriginal heritage, national heritage, pollution, biodiversity, are not conveniently exempted or trivialized in an Impact Statement.

The field of impact assessment has developed over many years to include Strategic Environmental Assessment (SEA), Integrated Impact Assessment, Cumulative Impact Assessment (CIA) and other forms of impact assessment capable of analyzing the likely impacts of proposed policies, programmes and projects in a cumulative manner over a range of issues (Byer and Yeomans, 2007; Duinker and Greig, 2007; Elliot and Thomas, 2009). Despite these developments, the traditional project-based assessment of individual development proposals remains the norm. This can be seen with the assessment of the Bickham coal mine, which was largely undertaken in the absence of a SEA of coal mining in the region and a CIA of the cumulative impacts of coal mining (one had previously been undertaken in the late 1990s but did little to influence the direction of the industry; see NSW Department of Urban Affairs and Planning, 1997).

2.4 Theoretical Synthesis

What do the above concepts offer for the construction of the Pages River? In summary, they highlight the need to attend to different river experiences and stories. Solastalgia and topophilia emphasize the emotional attachments to existing physical environments, with topophilia being a positive psychoterratic condition while solastalgia

is a negative condition. Both are derived from actual experience of (at times changing) environmental relationships and both are concerned with the emotional attachment to place and sense of place. Within the modalities of feeling and emotion, we argue that both solastalgia and topophilia are personally experienced, but until they become more widely understood and used there might not be a suitable language for individuals and communities to articulate the feeling. A feeling of distress may be inchoate, nevertheless its intensity may be experienced corporeally and the inability to translate feeling into thought (articulated emotion) may actually heighten its intensity. Prior to the articulation of the concept of solastalgia, experiences of distress and despair were common responses that people had to environmental degradation (Connor et al., 2004, Albrecht 2005), but the inability to translate private feeling and emotion into a shared language meant that they were cast at the level of a personal private anguish, rather than a shared response, one that could potentially be used in social impact assessment of development within the EIA process.

We see the built thoroughbred landscape as an artifact defined largely by topophilia. The Bickham Coal Mine was a proposal with high likelihood to become an actual coal mine. The felt threat to a loved place/landscape, one intimately connected to the local environmental history and the constructed landscape of the stud farms, is expressed in a negative emotion that is pre-solastalgic but nevertheless generates deep anxiety about the future. While there is no lived experience of solastalgia because the environment has not actually changed, the threat of substantial and/or irreversible change generates a form of pre-solastalgic tension, or what Albrecht (2012) defines as eco-anxiety. In other areas of the Upper Hunter where coal mining has actually taken place, the shift from the

emotional experiences of eco-anxiety to solastalgia has proceeded. The concept of solastalgia is now widely understood and used in the region, so much so that it has been incorporated into a case in the Land and Environment Court of NSW (Bulga Milbrodale Progress Association v Minister for Planning and Infrastructure and Warkworth Mining Limited) where the people of the Upper Hunter village of Bulga have used the concept to describe their response to current mining impacts and the likelihood of their solastalgia, expressed as a loss of a positive sense of place, increasing if open-cut coal mining is permitted to expand and come closer to their village. A discussion of this case and the implications of a recent decision in favour of the people of Bulga protecting their place and sense of place is to be found in section four below.

Impact assessment, particularly focusing on hydrological issues, was the main vehicle for the formal opposition to the proposed Bickham coal mine, yet other mines, perhaps ironically, benefitted from this process because if Bickham had proceeded it would have created additional pressures on rail and port infrastructure which were, at the time, operating at capacity. Strategically, the formation, and subsequent activities, of the Bickham Coal Action Group (see below) was vital in keeping the issue media salient, promoting awareness through billboards and other signage, engaging in social media and emphasizing a positive link between horses and water, in contrast to the negative connotations of coal mining.

3. Coal Mining and Thoroughbred Breeding in the Upper Hunter

The construction of the Upper Hunter region through the engagement of coal mining, thoroughbred breeding and, to a lesser extent, viticulture, has been the subject of

extensive research (McManus, 2008a, 2008b; McManus et al., 2011; McManus et al., 2013). There is no question that the coal mining industry is a powerful entity, comprised of competing companies, individuals with agendas, and so on. It has been successful in projecting itself as a single entity, one that is vital to the economy of the Hunter region, the economy of NSW and at a national level. Australia is the world's largest black coal exporter, supplying more than twenty countries around the world and exporting more coal than the combined exports of the next two largest exporters; Indonesia and the Russian Federation (see Australian Coal Association, 2008). There are approximately 37 coalmines in the Hunter Valley (which includes both the Upper Hunter and Lower Hunter areas), of which 17 are open cut mines, 16 underground mines and four mines that use a combination of both methods of mining. The major companies involved in this industry include Rio Tinto (which manages Coal and Allied), Xstrata, BHP Billiton and Anglo Coal, which between them control a third of the world coal trade. In 2011, they were joined in the Upper Hunter Mining Dialogue initiated by the NSW Minerals Council by five other companies with interests in the Upper Hunter, namely Ashton Coal Resources, Mt Arthur Coal (owned by BHP Billiton), Bloomfield Collieries, Muswellbrook Coal Company, Peabody Energy Australia and Vale.

Australia has large reserves of coal, and a comparatively small demand for both coking coal (used to make steel) and thermal coal (used for power generation) relative to the available reserves. This contrasts with some industrialised countries in Asia, which has meant the growth of coal exports to Japan, South Korea and Taiwan (Pearse, 2010; McManus and Connor, 2013). These three countries combined account for approximately 85% of exports (McManus, 2008a, 2008b; Hunter Valley Coal Chain, 2011), although the

health impact caused by the fallout from the coal fired power stations in the Hunter Valley is important regardless of export volumes. The Port of Newcastle is the largest black coal export port in the world with 97 million tonnes (Mt) of coal exported in 2009-10 rising to a record 122 Mt in 2011-2012 (Newcastle Port Corporation, 2012). Projected exports of coal from Newcastle vary from 180 Mt per annum in 2015 (Boyle, 2010) to 220 Mt per annum in 2014, 244 Mt per annum in 2019 and 278 Mt per annum in 2024 (ACIL Tasman, 2009). The increased capacity of the port to export coal has resulted in bottlenecks further up the Hunter Valley Coal Chain (HVCC), the complex and rapidly growing network of mining, rail and port operations that reaches over 450 kilometres and “is driven by the need to export very large coal volumes from a very concentrated network” (Hunter Valley Coal Chain, 2011). The HVCC extends beyond the Hunter Valley, west to Ulan near Mudgee, north to Gunnedah and Whitehaven, north-west to Gloucester and south to the coal-fired power stations around Lake Macquarie. It comprises 35 coal mines, 14 producers, 27 points to load coal onto trains, approximately 29 trains (generating 15,000 trips per year), and three Coal Loading Terminals at the mouth of the Hunter River containing a total of seven ship berths (Hunter Valley Coal Chain, 2011).

The scale of this industry means that it is a behemoth on the political scene. The only industry with economic clout and political connections to challenge it is the thoroughbred breeding industry. The Upper Hunter is generally regarded as the leading thoroughbred breeding region in Australia, and one of the most famous in the world after the Inner Bluegrass of Kentucky (McManus, 2008a; 2008b; McManus, et al., 2011).

According to the press release of the then NSW Premier, Kristina Keneally, in May 2010, when announcing the rejection of the proposed Bickham coal mine, the thoroughbred industry in NSW (which includes parts of the state other than the Upper Hunter and includes breeding and racing) was identified as “the second largest in the world” and “injects approximately \$2.4 billion into the State economy each year”. Under the heading of “Background Facts” in the News Release, notable facts included the Hunter Valley being “one of three International Centers of Thoroughbred Breeding Excellence (alongside Kentucky in the US and Newmarket in the UK)” and the industry being “concentrated in the Hunter Valley for some 150 years” (NSW Government, 2010).

The economic clout of the thoroughbred industry, its value chain, its employment generation, its world standing and its sense of longevity in this place (invoking notions of tradition and sustainability) were highlighted strategically to counter the arguments of the coal mining industry. Despite these economic and intrinsic values, the issue that was identified as the priority reason for rejecting the proposed Bickham coal mine was an instrumental one, the impact on water. The news release stated: “the project was stopped due to risks of water contamination and drainage particularly on the Pages River ...” (NSW Government, 2010).

Water is a particularly divisive issue between coal mining and the thoroughbred breeding industry. It is also a focus for dispute within the thoroughbred breeding industry in the Upper Hunter (McManus, 2008a). In their efforts to promote themselves as “clean and green”, thoroughbred farms tend to use high levels of water use in regions such as the Upper Hunter. Wealthy thoroughbred breeders have the means to acquire water and “drought proof” their properties, particularly as the image of what is a successful and

well-maintained farm (and hence the transferability of this image to the quality of care for the horses) involves the farm looking green. The green livery is contrasted with coal mining, as made explicit in billboards in the region and articulated by one Upper Hunter Thoroughbred Breeder:

Generally horse breeding is clean, green and environmentally friendly, while coal mining is nearly the reverse – they use massive amounts of water and they're dusty and dirty. They leave a big scar on the landscape. Thoroughbred farms are basically boutique botanical garden type properties.
(TB9)

4. The Pages River and the Proposed Bickham Coal Mine

It is within the above context that we now turn to examine the Bickham Coal Mine and the Pages River. The Pages River is an intermittent stream that flows south-east from north-west of the town of Murrurundi. It joins the Hunter River below the Glenbawn Dam (which itself is on the Hunter River), south of the major thoroughbred breeding establishments near Scone and Gundy (See Figure One). It is thereby a major tributary of the Hunter River. The Aboriginal history of the Pages River as an important stream for the Wonnarua people has been highlighted by Connor et al. (2008). The absence of Indigenous people on the Water User Groups, established by the NSW government to manage water use on various rivers, was also noted by Connor et al. (2008).

INSERT FIGURE ONE ABOUT HERE

The Bickham site was, from European settlement in 1850, a grazing property owned initially by the Wright family and from 1982 to 2002 by the Bromley family. In 2002, it was sold to two families with backgrounds in the mining industry, including the sale of earthmoving equipment and the operation of relatively small coal mines in the Lower Hunter at East Maitland and Rix's Creek north-west of Singleton. Exploration of the site had occurred in 1999 and the Bickham Coal Mine was proposed in 2002 (Bickham Coal, 2010). An application to extract a "bulk sample" of 25 000 tonnes was approved in early 2004 and the sample was extracted in 2004 and early 2005 before being sent to Asia so potential customers could conduct trials on the burning properties of the thermal coal (Bickham Coal, 2010).

The proposed Bickham Coal Mine was to have a lifespan of 22 years, a capital investment of \$70 million and an annual output of 2.5 megatonnes (Department of Planning, 2005; Connor, et al., 2008). The initial proposal involved the extraction of water from beneath the Pages River by two boreholes. Connor et al. (2008, 79) believe the proposed injection of water into the river, after use in the coal mine, "strained credulity". They were not alone in this perception as the initial proposal resulted in the formation of the Bickham Coal Action Group (BCAG) to oppose the proposed coal mine.

The formation and approach of BCAG was high profile, including the membership of stud owning media personalities and the advertising on billboards throughout the Upper Hunter region. In this way, the issue was projected not simply as landowners adjacent to the Pages River being concerned about what was happening in their backyard, and therefore being open to criticisms of NIMBYism (Not In MY

Backyard), but was expanded to highlight the concerns about coal mining for the thoroughbred breeding industry throughout the region. This was in keeping with land use changes that had occurred further down the Hunter Valley, where dairy farms, vineyards and horse studs around Muswellbrook had been replaced by coal mines, or were now adjacent to coal mines (Hunter Valley Thoroughbred Breeders Association and Aushorse Ltd, 2007; Bevan, 2012; Munro, 2012; McManus and Connor, 2013).

The Bickham coal mine proposal changed over time. The initial proposal with its bore holes beneath the Pages River gave way to an amended proposal that involved a reduced mine site area, but still involved the proposed mine being close (150 metres) to the Pages River and being below the level of the river such that it could impact deleteriously on downstream flows (Worley Parsons, 2009). From 2006 until 2010 the Upper Hunter, like much of south-eastern Australia, experienced drought conditions. As noted by Connor et al. (2008), by mid 2006 the Pages River (which normally experiences intermittent flow) was no longer flowing and nearby towns soon began to experience water restrictions. Water became the fulcrum, with the future of the proposed Bickham coal mine balanced on one end and the Pages River and the thoroughbred studs weighing in on the other.

The stories of the coal mine were very public. They were visible in the region, on professionally presented billboards and small hand-painted signs in paddocks (see Figure 2 and Figure 3).

Insert FIGURE 2 AND FIGURE 3 ABOUT HERE

One particular innovation used to oppose the proposed Bickham coal mine was the production of a You-Tube video. The original video of just over one and a half minutes duration (324 views) spawned a shorter video (275 views). In these videos, scenes of the Pages River, people living with the land (including agriculturalists, dairy farmers and, in the longer video, thoroughbred breeders) were disrupted by the noise and blackness of coal mining imagery. The river was constructed as “the lifeblood of the people”. The question posed was: “... the possibility, however small, of killing a river – is there anything in this world that could be worth the risk?” This shorter video was then developed to include well-known local horseman and award-winning environmentalist Peter Andrew, who was introduced as a “farmer and river expert” (117 views). Peter Andrew answers the original question – “nothing justifies killing a river”.

5. Channeling the Flow

The proposed Bickham coal mine assessment is notable for the absence of stories about the Pages River and the psychoterratic relations of local people and land and water. The application of the scientific approach to the assessment of hydrological impacts channelled the various river stories into a hydrological study of stream flow volume and water contamination. It produced a mass of numbers that was mostly unintelligible to an average educated adult citizen. As noted by Connor et al. (2008), this scientific lens became a battleground in itself, as various departmental organisations and community activists accepted the science or, in this case, were wealthy enough to pay scientists to challenge the science that was paid for by the mining company. This was important in creating uncertainty, which was to be resolved by additional, more detailed scientific

studies over a longer period of time to account for seasonal variation. Importantly, while this was a successful strategic move by BCAG and their allies that enabled them to “buy time” and work on changing community views, it also meant that the coal company was engaging on the water issue at a time when concepts such as solastalgia and the evolving climate change discourses were shifting the discursive terrain that coal mining was operating on.

This can be seen in April 2013, when the Bulga Milbrodale Progress Association appealed against a decision to grant Rio Tinto the right to extend their Mount Thorley Warkworth coal mine, bringing it very close to the small village of Bulga in the Hunter Valley (Lagan and Rubeli, 2013). This appeal, which was supported by the Environmental Defenders Office (based in Sydney) included evidence by one co-author of this article, Professor Glenn Albrecht, who highlighted the existence of solastalgia throughout the Hunter Valley as many small, rural villages and rural holdings were erased by open-caste coal mines. The appeal was successful in the Land and Environment Court, and for the first time, psychoterratic conditions, in particular, solastalgia defined as loss of sense of place, were acknowledged (with qualifications) in assessing the potential impacts of a proposed development (Land and Environment Court, 2013). This outcome caused consternation within the NSW government and the mining industry, such that in July 2013 a draft planning policy was released (Minister for Planning and Infrastructure, 2013) which proposed to “make the economic significance of mining projects the ‘principal consideration’ of the assessment process” (Nicholls, 2013, 10), thus consigning social and psychoterratic impacts into the background

The discursive terrain around climate change was also changing among thoroughbred breeders (see McManus, 2008b). Climate change became a strategic weapon that could be used by the thoroughbred breeders against the coal mining industry. We suggest that there certainly has been the strategic engagement with, and use of, environmental discourses by thoroughbred breeders, but this is partly out of necessity because of the formal legal requirements for impact assessment in accordance with the NSW Environmental Planning and Assessment Act 1979 prior to the Bulga decision.

Thoroughbred breeders, similar to people who anticipate the negative impact of a housing development, highway or wind farm long before it is built, have legitimate psychoterratic concerns and feelings. However, they do not have solastalgia, unless they have change agents such as pollution or mining directly impacting on them. We suggest that these feelings are situated within the psychoterratic continuum from topophilia for the “constructed pristine”, and eco-anxiety about possible impacts to the solastalgia of actual impacts.

Thoroughbred breeders are likely to experience feelings of topophilia as much, and probably more so, than many other people living in the Upper Hunter region. Indeed, our interviews with thoroughbred breeders in the Hunter Valley highlighted the positive connections with the land and air as at least one breeder described the emotion of re-fencing the property to avoid overstocking, and to drive to the paddock beneath the ridge and watch the wedgetail eagles soaring (TB9). Thoroughbred breeding, and the raising of horses in the Upper Hunter, relies on good quality soil, drainage, gradients and an awareness of environmental risks that may negatively impact the health, and hence economic value, of the horses. In addition, the intersection of animal and psychoterratic

geographies produces an equine aesthetic where the form and beauty of the thoroughbred can be seen within a landscape that matches its 'perfection'. It is this combination of landscape and animal that Tuan suggested could produce topophilia in that it "... evokes pride of ownership or of creation; joy in things because of animal health and vitality" (Tuan, 1974, p.247).

Topophilia, solastalgia and eco-anxiety are not separate from the viability of the individual business and the livelihoods of participants in the thoroughbred industry. As jointly argued by the Hunter Valley Thoroughbred Breeders Association and Aushorse Ltd (2007), being a collective and representative group of people in the Hunter Thoroughbred industry and the marketing arm for the thoroughbred breeding industry, respectively, with significant overlap between the two organizations:

The horse breeding industry needs quality grazing land in a pleasant environment with reliable water and clean air. The scale of coal mining in the Hunter, and the number of new mine proposals and mine extensions have reached such an extent that the sustainability of the Hunter thoroughbred industry is threatened and an industry that is an historic part of the Hunter's beauty and diversity may be forced from the area.

6. Conclusion

Emotional geographies are powerful triggers (following Kearns and Collins, 2012) for debating sustainability issues in contested locations. As noted by Anderson and Smith (2001, 7) the "glaring obvious" omission of emotions within such debates needs to be addressed, particularly given the likely material and emotional outcomes of such debates

as conducted on current discursive terrains. In this article we examined the issue of a proposed coal mine in the Upper Hunter region of NSW from the perspective of an emergent psychoterratic geography, thereby offering a much-needed conceptual framework and vocabulary for incorporating feelings of strong emotional attachment to place, concerns about potential threats to much-loved places, and the feelings of desolation experienced by those residing in a place that has been significantly, and negatively, changed. In doing so, we attempt to address the “intractable silence (Anderson and Smith, 2001, 7) that is the lack of engagement with emotions in the actual policy debates. Unfortunately, but consistent with the findings of Anderson and Smith (2001) and Kearns and Collins (2012), analysis of the very contentious Bickham Coal Mine proposal highlights the simultaneous existence of scientific and psychoterratic experiences, but their unequal validation in practice. In the recent case of the village of Bulga and the proposed expansion of the Mount Thorley Warkworth open cast coal mine, psychoterratic geographies were recognized in the Land and Environment Court decision of April, 2013. This decision highlights the capability of citizen initiated action and for the ability of such institutions to formalize psychoterratic conditions as part of impact assessment. However, the response of the conservative NSW government in attempting to amend the legislation framing impact assessment also demonstrates the opposition to the incorporation of psychoterratic geographies into any aspect of the assessment process, and the dependence of NSW governments on coal mining activity (Minister for Planning and Infrastructure, 2013).

In relation to the proposed Bickham coal mine, we argue that the underlying social values have not been addressed in this conflict. One smaller coal mine proposal has been

rejected because of water management concerns, particularly in relation to the Pages River, which was the official basis for arguing against the proposed coal mine, however, as demonstrated in this article, coal is being mined in greater volumes elsewhere in the Hunter Region and the total volume of coal exported from Newcastle has been increasing year upon year, with massive impacts on people, landscapes, local ecology and hydrology (and the global climate).

Economic investment in the thoroughbred breeding industry is also a motivation for opposition to a proposed coal mine. There is no doubt that some thoroughbred breeders do support coal mining, but not upstream from their thoroughbred breeding properties which they have built up over many years. They have invested heavily in topophilia and wish to maintain that state of the environment and their positive emotional connection to it. Their economic survival depends on it. While they may not experience solastalgia at present, as the example of the proposed Bickham coal mine highlights, they may be concerned about the possibility of experiencing it given what has happened to other parts of the region, specifically the outcomes of legal cases such as the one involving Bengalla mine and Rosemount vineyard in the late 1990s and the loss of some long-established studs and vineyards to coal mining in the Muswellbrook area of the Upper Hunter.

The legally necessary use of impact assessment, combined with the strategic use of the water issue, channels the Bickham mine impacts' discourse into one of hydrology and scientific measurement of pollutants. Yet, psychological impacts such as solastalgia and topophilia, neither of which sit comfortably with formal impact assessment processes as currently undertaken, are also likely to be underlying motivations for environmental action in this particular instance. Despite these tensions, we make the case for the

expansion of such an approach. Similarly, Kearns and Collins (2012) suggest in other environmental conflicts where there are strong attachments to place, psychoterratic geographies that explore relationships between place and emotion are also likely to be hugely relevant.

It is important that further consideration be given to the inclusion of these psychoterratic geographies both within, and alongside, the formal impact assessment processes and specifically within an expanded concept of SIA. While in the case of the proposed expansion of the Mount Thorley Warkworth mine this inclusion came at the appeals stage to the Land and Environment Court, we argue that it should be included in impact assessment from the beginning of the process. Impact assessments would, then, genuinely be plural rather than being reduced to conflicting scientific interpretations of the biophysical. In doing so, we open radical possibilities for new understandings of the world, and new ways of acting within this world, that are not flattened by the language of the formal “environment”, but are enhanced by a new psychoterratic geography and its new and older psychoterratic concepts (Albrecht, 2012). The SIA process could include, for example, changes to the way impact assessment is conducted, who conducts it and what is included in the assessment. While some of these possibilities exist in other contexts, as noted earlier in this paper, their application in relation to coal mining in the past in NSW has been very limited. The assessment could be genuinely independent, at a distance from the proponent but requiring the proponent to provide all relevant documentation similar to an independent inquiry. It could also give greater emphasis to feelings of topophilia, so that they do not become translated into solastalgia. The inclusion of psychoterratic emotions within impact assessment processes may result in

modifications to proposals, or rejections of proposals, based not just on scientific constructions of hydrology but also on people's connectivity with particular places and environments.

Anderson and Smith (2001, 10) noted that "a return to relevance and the quest for a 'policy turn' in geography seem to us to be key areas where an awareness of how emotional relations shape society and space is important". They continued by recognizing the difficulties of knowing "how actually to grasp the emotional, and what to do with 'it' when we have" (Anderson and Smith, 2001, 10). This current article, we believe, contributes to grasping the emotional through the provision of a psychoterratic conceptual framework and suitable vocabulary for various earth-related emotions, and provides guidance on what to do with 'it' through the suggested insertion of psychoterratic geographies early in the impact assessment process. In doing so, we demonstrate that geography is well placed to grasp, develop and incorporate emotional understandings into policy debates, but recognise that this is merely a beginning and that much more field-based research is needed if we are to genuinely understand and engage with psychoterratic geographies of place attachment.

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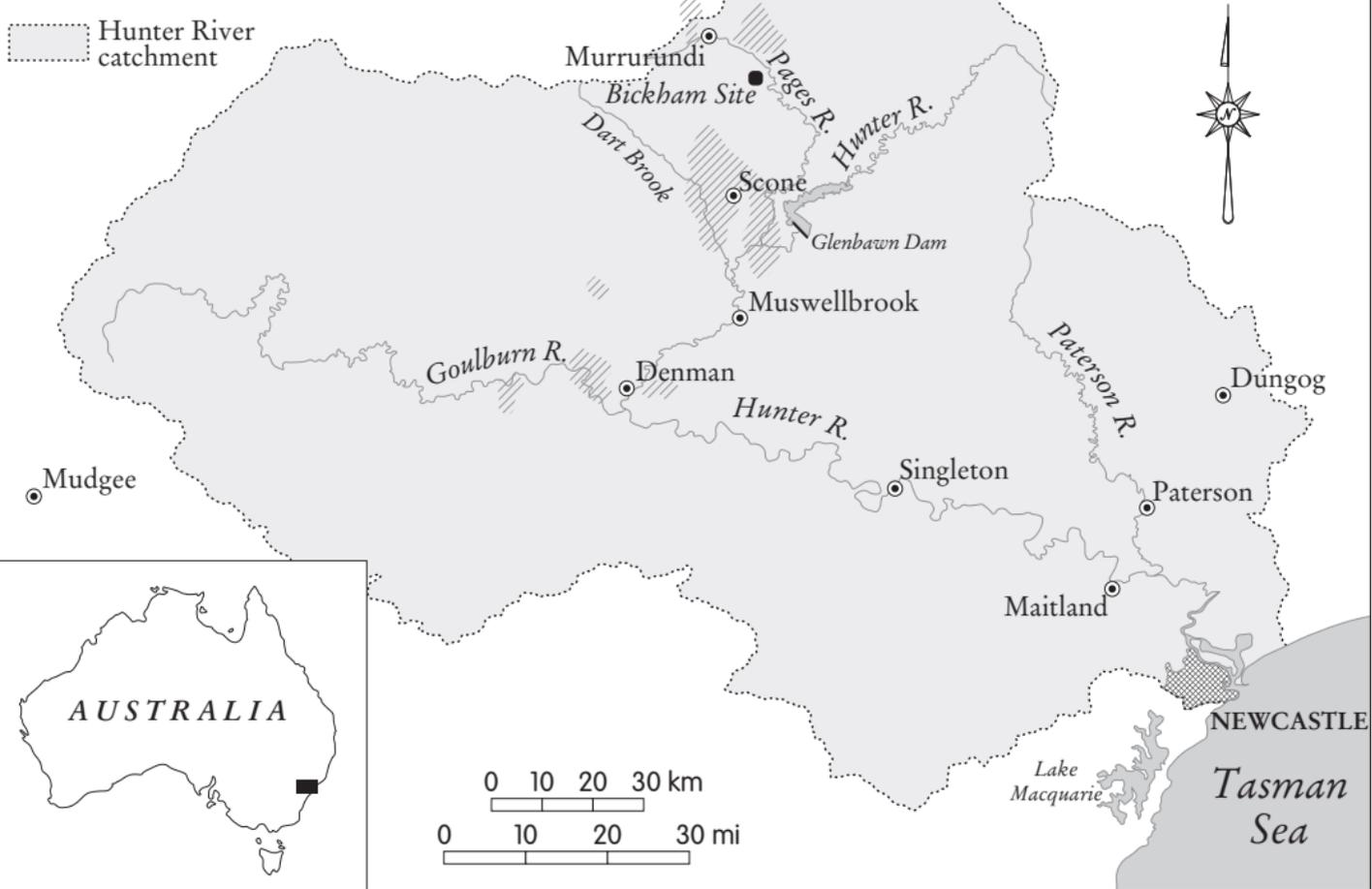
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Thoroughbred breeding areas

Hunter River catchment



AUSTRALIA

NEWCASTLE

Tasman
Sea



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Figure Two: Billboards linking the proposed Bickham coal mine and waterways and river systems.

Figure 3



Figure Three: The linking of thoroughbred breeding and coal mining with water in the Upper Hunter region.

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