PEARL DAYS John Ruppersbery

Pearl Days. Thank you for the Days, those Golden Days you gave me. Pearl Days offer a fond memory of Days with the Pearl-bordered Fritillary (*Boloria euphrosyne*) in the New Forest. Days captured indelibly in memory, poignant and very much treasured Days.

Pearl Days are essentially a personal reflection of the Pearl year in all its extremes; a glimpse at highlights, distressing and sometimes heart-breaking lowlights, with a sprinkling of anecdotes often with heart-warming conclusions. Ever conscious that this is an evolving landscape under the Guardianship of the New Forest Keeper, habitat patch, management and ecology is discussed. The theme attempts to explore more than the statistical facts of the last decade, the ups and downs of each season, the flow, dispersal and new colonization of what is strangely termed the New Forest metapopulation. Recollections of an occasional fascinating observation or anecdote add substance as a distraction to chronicling hours of diligent monitoring. The adult Pearl season is the main event for many, though not as crucial to the Pearls survival as the critical larval development. An insight of my own peregrinations and study to attain the goal of a better understanding of this delicate and threatened creature, an iconic symbol of spring in the woodlands east of Brockenhurst.

Much of the Scientific details of my studies will be found on the Branch Website. The website will carry the full transcript, which touches briefly on Hampshire and its nearby environs, including Grovely Wood, where a clandestine unauthorised introduction of illegally captured New Forest Pearls, in May 2009, have subsequently flourished. Happy days at Grovely with Gordon Mackie and, much further afield, on Bodmin Moor with my good friends from the Cornwall branch. Golden Pearl Days where the effort has frequently been rewarded with magical moments hand in hand with encouraging counts, tempered by numbing heartache resulting from natural causes and even anger caused by human intervention.

In 2011 and 2012, the fortunes of the Pearl-bordered Fritillary in the New Forest has experienced the two extremes. So there really isn't a better time to tell this story.

Twenty something years ago, at the start of the 1990's, Pearl were still extant in the woods below Farley Mount, having just colonized Crab Wood out of the West Wood complex. All was not well, and with successional habitat change Pearl were lost within a couple of years. Local extinctions accelerated across the south country, and by 1998 Pearl were extinct in Dorset, a county where they flourished just a decade earlier.

At the time, I confess I took this spring Fritillary for granted, simply because it was still reasonably abundant; in much the same way as I thrilled to hear the evocative trill of the Wood Warbler in the woods of the New Forest in 1990 but was acutely aware of its rapid decline by 1995.

By the mid nineties the Pearl was struggling in the New Forest and could really do with a helping hand. This was, in part, provided courtesy of the election of the New Labour Government in 1997. The Forestry Commission were mandated, by the Govt., to introduce a policy where wildlife conservation took a higher profile and priority. Fortunately, at this time John Gulliver had been appointed Head Keeper, and was instrumental in deploying his knowledge, interest and enthusiasm for all things entomological to directly influence the Pearl's precarious prospects. Habitat management in the Pignal and Ramnor Inclosures of Greater Parkhill, the area north-east of Standing Hat, first caught and then stabilised a desperately dwindling population (part of the Inclosure banks remain, but the internal fences have gone). In the late 1990's, two or three visits each May culminated with one of those golden days in late May 1999, shared by luminaries from the New Forest Bird Group, including Keith Morgan, a HBBC member and occasional transect walker. Recently, Keith vividly recounted the experience "A magical day of unbroken sunshine and clarity. We had lunch sitting on tree stumps on Ramnor Hill with dozens of Pearl flitting and cavorting around us…exhilarating wonderment. The uplifting spectacle as a total experience remains vivid in the memory. Certainly one of my butterfly highlights."

New Forest Research site 1: 1 May 2007 (John Ruppersbery)

New Forest Research site 2: 22 May 2007 (John Ruppersbery)

The new Millennium announced itself with an expansion in distribution, with a thriving colony adjacent to the Etherise Gutter in Perrywood Hazeley. Across the Forest, counts were subject to seasonal fluctuations though numbers encouragingly improved but over a wider landscape area. In New Copse Inclosure, an area of clearfell was created in 2001and the accompanying ditch works, spoil deposits and specific forest operations, directly benefited habitat potential for the Pearl. Pearl were also present, though in low numbers, along the main wide trackside, and it appears likely that dispersal from this trackside activity, and maybe from Perrywood Hazeley, were responsible for colonization of female Pearl and egg-laying on the area of clearfell in 2003, where bracken/leaf litter and a favourable violet-rich seed bed prospered.

These components provided a developing structure which gave rise to a truly spectacular experience on 19th May 2004. Having arranged to meet up with Keeper Jonathan Cook, we made our way to the mid-way point alongside the main clearance ditch where in the lea of a field maple, we stopped abruptly. With breath-stopping exhilaration, the sight of dozens of Pearl held us captive. Spellbound we watched as Pearl patrolled up and down the ditch side, males searching for newly emerged females. For what seemed several minutes we were lost deep in the silence of our own emotions, my cup of happiness filled to overflowing. A Southampton bound train broke natures tranquillity and glancing at my companion, a radiant beam broke across Jonathan's rosy face; a persona of contentment and elation. Turning to me, with a wry chuckle and his trade-mark spark of bravado, Jonathan quipped "John, those are tears running down your face". Which they were, but I defy any nature lover to hold back their emotions in the face of such a heart-warming vision? The mellifluous cadence of a willow warbler floated joyfully over the testosterone-charged clearance. A roe deer barked and, as we made our way off the clearance, a nightjar rose from under our feet.

Shared experiences strike a chord that remains more vivid and poignant in the memory for the very sense of having been shared. Herein lays the fallibility. The flaw in sharing experiences being that others then know! Not that another tear-jerking encounter, shared with the effervescent Anne McCue in 2009, necessarily falls within that particular category. Visiting Park Inclosure, Anne and myself (I) were enthralled by a dozen or so Pearl as they voraciously nectared three or four abreast on adjacent bugle - a square foot of heaven! Not to mention tears of joy!
The previous week-end, the serendipity enjoyed in what is essentially the peaceful pursuit of a quintessential spring Fritillary was shattered by the brazen onslaught of collectors. Intent on ravaging Pearl, these scurrilous degenerates struck in three separate incidents over the week-end 9th & 10th May 2009; Parkhill on Saturday, a grass ride in Pignal on Sunday morning and in mid-afternoon at the eastern end of New Copse.

Pearl-bordered Fritillary egglaying at New Copse Inclosure (Paul Brock)

The Saturday capture, by a BC member, were transported to Wiltshire, where the few that survived the trauma of capture were released (unauthorised) to form the nucleus of what is the Grovely Wood colony; egg-laying was observed a fortnight later which might suggest a second release, maybe from bred species collected from Pignal in 2008, but who knows!

Of these three reported incidents, at least two were committed by BC members who were intent on displaying their irresponsible behaviour to the detriment of a known threatened and endangered species. We know who they are, one even has a record (and reputation) of transgressions, caught capturing Grayling by a FC Keeper.

Who is to blame? The very same source who has encouraged, or should that be incited , interest with relevant information of locations; Field-trip leaders, publications, website observations and recorders, especially those citing significant counts to a location. Most of these well-intended sources provide a service, information and records, in the belief that such a service is assisting the cause of conservation or education.

The flaw in sharing knowledge can, quite innocently and inadvertently, act to stoke-up trouble. A publication states precise locations and even provides an understandable map with grid reference for Pignal (and BC receive £1 for each book sold). In earlier years, our own Report has provided counts to locations. While ecologist Adrian Hoskins website provides information on the species and ecology, the location is no more precise than the New Forest, or north-west (Hampshire). However, another popular website discloses the precise location, with detailed information on the location, for example New Copse, which readily attracts all comers.(I have seen them!)
I cannot say I would even venture to agree with the description as to the status and successional development of New Copse at that time. The Keeper and myself considered New Copse in transition, with two areas in rapid decline while another was taking off and developing. However, these points aside, the actual issue is the damaging implication of stating precise locations. I certainly approve of one website but have severe reservations of any website, or information source, that provides sensitive information detailing precise locations.

Branch stalwart, Ashley Whitlock, a prolific recorder, walks leader and website observer, commented “The damage was done in those years when information was freely available. We have had to learn the hard way and that was too late in the day.”

Following the mass collecting orgy of 2009, the Forestry Commission issued a directive and in June 2009, John Gulliver phoned me in person and we discussed the situation and implications. In effect, this sought to curtail disclosure of counts to locations.

The damage had been done many years before. We may just as well have produced a “Waymarked Walk” for Pearl-bordered Fritillary, such was the open availability of what should have been sensitive information.

The views held by Ashley mirror my own, and it is recognised that they may differ from the stance of others, who may tolerate and accept the status of these misguided individuals whose intent goes beyond observations and recording - be they of counts or images! “If they are members, we can keep an eye on them”. Such is the way of the world.
The vast majority of BC members are well intended and would be horrified by unauthorised capture and removal of butterflies. Matthew Oates has objectively covered the ways of collectors. The very same school teacher, supplementing his income, was confronted leaving Grovely Wood with Purple Emperor in a glass topped box. Fortunately for the offender, the getaway was made minutes before the responding Wildlife Ranger arrived at the scene.
Collecting of butterflies in the New Forest is in contravention of the Law. Where there is evidence and Police are in attendance, butterfly collectors in the New Forest are liable to prosecution for a breach of English Nature (EN) and FC statutes; contravention of SSSI (damage to SSSI) and FC By-Laws.

In 2009, I was ready to go. My commitment remains steadfast to the Keepers. It is they who are the Guardians of the Pearl, which they cherish on their beat, and it is they who are responsible for conservation management so that we can enjoy the sight and splendour of the Pearl, other butterflies, insects, wildlife and landscape. In my role as a key-stakeholder, I deliver salient information on conservation issues, such as appropriate habitat management, to the Keeper. In effect, we work together in this respect although it is the Keeper, maybe with the assistance of colleagues and Two Trees, who deliver the crucial habitat management.

The Keepers also receive a full breakdown of Pearl counts from circa twenty locations. In contrast, HBBC receive an abbreviated copy, which has to be scrutinised and passed by the Keepers. Typically this would give account from a dozen locations from within two large fenced enclosures north of the rail line, of which some 952 acres form Greater Parkhill. When translated, it appears the Parkhill count was 552. Similarly, Mark Swann is credited with 531 in Pignal, though some 300 were actually in another fenced area where Perrywood Hazeley and Woodfidley is traversed. Mark, on his bike, and I meet and exchange experiences occasionally, and I acknowledge his valued contribution to the cause.

I have got ahead of myself by several years and return to the formative years of my Pearl experience. I will, though, concentrate on an area in preference to a chronological approach. In New Copse, a number of scallops were created along the main east to west track, where various initiative were deployed which included chain-harrowing pulled by a quad bike, bracken brashing, ride widening and cosmetic attention. The quad biking was hair-raising though nothing alongside watching fearless Robert (now in the Forest of Dean as National Trainer) rounding-up miscreant ponies in New Copse.

However, the most significant developments included the creation of a small clearance and adjacent trackside work, towards the eastern end, known affectionately as Cooks Corner. This valuable work was performed by volunteers from the FC Two Trees conservation, in 2005/06. The brash was carefully raked and removed to provide an area which was colonized in 2006 & 07. Cooks Corner has consistently produced figures comfortably in excess of 25, and frequently witnessed the earliest emergence. That is until 2012, when only the tumbling banks survived the catastrophic larval mortality which beset the perpetually waterlogged flat areas, especially those precious areas north of the track, where considerable fresh nibbling was evident and several larvae were observed prior to the onset of the atrocious wet weather of April. Cooks Corner has been the scene of illegal and unauthorised collecting (circa 30 were lifted on 10th May 2009), and recipient of branches dumped on an area of egg-laying by irresponsible hardwood contractors (they were ordered off-site). Though influenced by the base-rich Headon Beds, whose sea-shells of long ago are exposed in a ditch to the north of the track, this lovely corner should remain viable for Pearl to mid-decade. It remains sufficiently dynamic to provide fertility and conditions for violets and basking litter though without the woosh factor which prevails in Grovely and the Jurassic limestone of Matthew Oates Cirencester Woods.

Away to the west, another area was cleared of Norway Spruce, and again this was raked and a bonfire enjoyed by the Two Trees volunteers. The area was deer proofed and the fence set back some 22 foot from the western bank. Native broadleaf trees, including hazel, and grasses grow protected from deer and ponies, but it is the banks and tumbling terrain outwith the fence which hold the interest for the Pearl. Numbers grew steadily to 30 plus in 2009 &10, but struggled to reach double figures in the troubled 2012 season, though they did fare better here, on the tumbling terrain, than elsewhere in New Copse. There is a happy ambience in this corner of New Copse and the proximity of the Etherise Gutter, here at its loveliest, adds to the attraction.

In New Copse, figures have fluctuated since a count of 96 in 2004 (described earlier).That year, the majority of Pearl were observed in two areas which now hold very few but provide a corridor for dispersal to the rail line drift and beyond. In 2007, 2008 & 2010, daily counts exceeded 100 from four distinct locations within New Copse. In 2011, with the benefit of weeks of glorious weather, spectacular emergence resulted in an early May count just shy of 300. In contrast, the highest count in 2012 was a mere 44 on 28th May. Yet at the end of March 2012, there were twice as many larvae nibbling on wilting violets as there were twelve months earlier, in the spectacularly successful 2011. How many eggs did the 150 plus females of 2011 lay? And how many eggs by the 25 females in 2012? As elsewhere in the New Forest, much depends on the weather conditions. Critically post-hibernation in March and April 2013, but the weather conditions thus far do not augur well, and flooding in two locations makes the picture even gloomier. On the bright side, fortunately at least 50% of emergence (and possibly 60%) was on or after 26th May, late enough to have the advantage of violet germination for egg-laying and pre-hibernation larvae. The downside, it then rained incessantly.

Fortune smiled when Peter and Pat Gardner joined me for a walk around New Copse on 18th May 2008. Eagle-eyed Pat picked out the dozen or so Pearl I failed to observe. After two hours of assiduous monitoring, we reached the 2000 clearance and threw ourselves selflessly into twenty crazy minutes doing battle with fretting birch and grumpy pine saplings and hurling ourselves recklessly over angry ditches, then with an expression of puzzled bewilderment Pat and Peter asserted “Why are all these Pearl flitting around? This isn’t their habitat, surely?”. I explained that they had helped with a record count and that this was the remnant of just four years earlier. We had actually raised the daily count to 116, the highest total in New Copse during my sorties (the 2007 Report recorded 127 on 1st May, but this included 55 north of the rail line).

In May 2009, former Dorset Chairman Brian Dicker and his wife Sylvia joined me for an absorbing day, mostly in New Copse. As is customary when in the presence of experts, I picked Brian’s brain and we mulled over numerous points. Meeting Keeper Jonathan Cook a few days later, I ran over the various observations Brian had made. Jonathan listened intently until I had finished and I asked for his reaction. It wasn’t instant, and then he burst into laughter “You’ve gone barmy, John. Don’t you remember we discussed all that last year and the year before…Don‘t you remember those young beech shading out that bit on the bend were going to be felled but ..They‘ll come down next year, but the big beech opposite is part of the landscape. ” The sapling beech shading out the violets were removed the following year and much has changed with more light along a wide trackside. Lovely.

Male, 28 May 2006 (John Ruppersbery)

Mating pair (John Ruppersbery)

Elsewhere, south of the rail line, Pearl eventually overcame the barrier of dense conifer and mixed woodland, to disperse a good mile deep into Frame Heath. In early May 2009, a male vigorously patrolled an open ride with such loyalty that it suggested its emergence may well have been along this very ride; by far the most suitable in Frame, and where a female was keeping a low profile, presumably having mated and while her eggs ripen.

Hereabouts, an area of conifer has been harvested (2010), with the clearfell fenced and subsequently planted with oak in March and April 2012. Prior to planting, the Pearl colonization of 2009 hung on and the egg-laying with favourable larval development, mostly along tumbling areas around ditches and banks, produced a relative bumper emergence in 2011, when towards 50 were observed.

With this success, Two Trees volunteers created a dispersal corridor to clearfell areas lower down the slope last winter. Two major drawbacks beset this well-intended initiative, and let's face it, nobody could foresee the horrendous spring weather of 2012 with its catastrophic and devastating consequences for larval development and mortality. In discussion with the Keeper in late March 2012, we resolved to seek to stabilize Pearl in the current area, where the most suitable habitat persists and will be improved further with a little help from conservation management. We also considered Pearl numbers would be insufficient to sustain this small new colony were dispersal also to take place to wide, open areas at a considerable distance from the donor colony. Our fears that this would jeopardise the Frame Heath colony are well justified, given the resultant weather and the precarious count of low single figures in 2012. Frame Heath is one of several vulnerable colonies as a consequence of the disasters of 2012, but time will tell!

Unlike nearby New Copse, where the Headon Beds generously outcrop and sea-shells of long ago can be found, Frame Heath is not overly blessed with base-rich soils, and is at its best higher up the slope in the vicinity of the 2009 colonization. Acidic soils dominate lower down the slope on the recent large clearfelled, open areas.

The precarious days long behind us, on-going habitat management and clearfell areas, especially where forest operations involved tidying-up and ditch work created spoil and a tumbling terrain, have presented potential habitat patch for Pearl dispersal.

Pignal, which first stabilised Pearl, and the then open Ramnor Hill, have undergone successional growth and ecological change, though recent scallops and habitat initiatives have facilitated Pearl to persist here over the years that BC members have monitored a species which, once abundant, dramatically carries the label endangered.

Colonies now exist in some twenty locations within no less than six fenced Inclosures, of which Parkhill is both the largest and most important. The small colony in the Holmsley area (Wooton Coppice) has been excluded from this analysis. Sources within FC suggest colonization from a Private woodland close-by. Time being of the essence, does not allow me to spend sufficient hours as I would wish at Holmsley, where visits are occasional and mostly cursory.

Pondhead was colonized in 2010, when five or six Pearl were observed in late May. This rapidly became 65 in 2011 and then dramatically fell to less than half-a-dozen in 2012. It would be a shame to lose Pearl from this lovely and unusual woodland, but it is now considered vulnerable. For those who haven't visited Pondhead, it is unique amongst New Forest Inclosure woodlands in as much as it is contained within a high deer-proof fence. In 2012, many more larvae were

observed in late March to 16th April, than there were adults on the wing in May and June. Two Pearl that did survive the persistently waterlogged, sunless conditions actually emerged on an open, bracken-clad tumbling area at some distance from the coppiced areas and rides. The flat areas where basking is via leaf litter, suffered catastrophic larval mortality when for weeks on end the conditions were continually waterlogged. Pearl larvae succumbed during the persistently wet weather, whether due to an inability to bask, to pathogens or predation.

In Parkhill, the most significant impact to the success of the Pearl in the New Forest was the 2001 clearfell and resultant forestry operations which cover a vast 21 acre plot. This large block of clayey, in part base-rich, soil slopes gently south to the Etherise Gutter, and the adjacent habitats of the various drainage ditches, banks and ride sides represent by far the most suitable habitat in the consistently most successful area for the Pearl over an eight year period to 2012. The area was planted with Corsican pine in early 2004 and is now developing into a plantation crossed by ditches, banks and comfortable rides. It is these habitat attributes, along with the base-rich soils influenced by the Headon beds which provide the suitable habitat patches in which the Pearl breed and nectar.

Back in 2000, Keeper Jonathan Cook was a proponent of the clearfell being completed in two stages, in order to provide continuity. An observation with which John Gulliver, years later in conversation in 2008, acknowledged should have been implemented.

The way it was: coppicing and hurdle maker Holland May at work (JR)

Jonathan is blessed with the gift of perception and visual acuity with regard to successional development and creation of conservation management, for both continuity of habitat and visual awareness of the landscape, which is a quality I greatly admire in him.

Jonathan and John were correct, there would have been greater continuity had there been a second-part felling in 2004. But who would deny the spectacular flight experience of early May 2007, when approaching 500 Pearl could be encountered on an early morning exploration of this clearance and swarms of Pearls mingled frenetically around the head.

Many hundreds were across this clearance in 2011; 86 along the top, with another 80 on the diagonal and well in excess of 100 in the tangle of ditches and pine saplings at the bottom south-west corner. Away from the easy walking on the rides, traversing the emerging plantation is best left to those nimble of foot, even if the spirit is willing! In 2012, the clearance remained the high spot, and the only area boasting a daily count in excess of 50 (29th May); contrast this with an aggregate index for Pignal of just 31. But as the clearance wanes, the ditches, banks and ride edges remain an integral habitat patch and crucial to the Pearls success as a holding area for dispersal to future habitat patches.

Park Inclosure, Perrywood Hazeley across Denny Lodge Inclosure to Woodfidley, are all areas where the Pearl have experienced fluctuating numbers over the years of monitoring. Though none as acute as the fall from over 300 to fewer than 50, as was witnessed in 2011 and 2012. In the forty years that John Gulliver knew Woodfidley, John says that he could always rely on Pearl being present. The fact that the Pearl have been observed in various locations thereabouts, probably adds credence to Woodfidley being the donor colony at the east end of this large, fenced Inclosure, just as the then relative infant Etherise colony can hold that claim at the western end. One year my searches at Woodfidley failed, although John and Mark Swann were both successful. Which goes to illustrate that even experienced recorders visiting a site they know intimately, can fail to observe Pearl although they are present. With New Copse just across the rail-line, and good numbers observed on numerous occasions on the line drifts, it seems highly likely that a number of Pearl just hopped over the fence, though this is by no means the definitive answer on which one can speculate as to the origin of the hundreds observed in the spectacular spring of 2011.

Park Inclosure has consistently held between twenty and forty Pearl -until 2012- and has been helped by various habitat initiatives, though a nearby clearfell proved disappointing. Until late May 2012, Pearl had not attained double figure status in this delightful oasis, before struggling to a high of 16 on 29th May.

Almost twenty years ago, a clearfell area was raked and then scarified. A four foot deep ditch channel replaced the old meandering ditch. This new deep ditch cut in to the base-rich Headon Beds and the generous spoil presented sumptuous tumbling mounds and banks to the sides of the ditch. A new side ditch was also dug in much the same manner. Most of the area was planted with Corsican pine in 1997.

An observant visitor to this developing area in the early years of this millennium would have seen mounds and banks of tumbling spoil with violets growing profusely amongst bracken and giant stands of spurge some four to five foot tall, and all this surrounded by a developing crop of conifer. But why should anyone come here? It seems probable that the colony of Pearl in this isolated location numbered as many as 100 as the millennium bounded in, but who was aware of the existence in those productive formative years? Nobody, it seems!

The tall, multi-umbel inflorescence of the Spurge (*Euphorbia*) represented the main nectaring source for the Pearl in the glory years of this isolated and fascinating colony. The cruel winter of 2009/10 killed off 92% of the spurge. The base-rich fertility on the tumbling mounds became slowly depleted and with the increasingly dominant bracken, benefiting from the space left by the

demise of the spurge, violets were less abundant. Three deer runs cross the area, which helped with breaking the bracken stands, while the bare soil created by the deer slots present opportunities for violets.

A narrow corridor existed over some 200 yards where Pearl larvae could develop in good habitat and reasonable numbers. Down its centre, a drainage ditch dissected discrete mounds of tumbling soil, while twenty feet to each side young pine, inevitably, grew steadily to create an increasing shade on their relentless ascent to 25 foot monster saplings by 2011.

In some of my annual reports, glowing references were made, and in 2007 so endeared to this area was I that I wrote affectionately ".this blessed ditch of happy memories.." and of the "valued research and study" afforded me here.

In the most viable recesses of this corridor, mounds of two to four foot across may support 3, 4 or even 5, 4th or 5th instar larvae, and nibbled violets were conspicuous on the most favoured mounds. Post early emergence also proved intriguing. Males would patrol up and down the sides of the dog-legged ditch, using the dog-leg as the demarcation to turn about. As long as females were emerging, males would remain loyal to their behavioural habit and to this blessed ditch. Three days without emergence, and a dispersal spasm would appear, and instead of males being confined to a mere 300 yards, suddenly Pearl could be found as much as a mile away. Though if emergence were to re-commence, maybe on a sunny morning after a day or two of indifferent weather, the males would be back patrolling the ditch side.

However, although the behavioural habit of adult Pearls was fascinating and monitoring essential, it was the study and research of the post-hibernation 4th and 5th instar stages that was so necessary and totally absorbing. It would be correct to say that as many hours in pursuit of Pearl larvae were spent here as at any other location. Elsewhere would involve diligent searching, frequently protracted and often fruitless. Here on this discrete and blessed ditch of happy memories, larvae were easier to find and, furthermore, the location was so isolated that there was no danger of being disturbed. With these attributes, a research and study area came in to being.

Research and Study

Any research and scientific conclusions drawn from studies in the New Forest need to recognise and consider the acidic soils, sometimes of an impermeable nature, the vegetation and (speed of) dynamism to successional growth, the habitats of the landscape terrain, along with various other factors.

The New Forest contrasts sharply with the south-facing, clay with flint overlying the porous chalk, providing well-drained base-rich (fertile) conditions, which persist in Grovely Wood, and the Jurassic limestone of the Cirencester Wood.

I consider it appropriate to make reference to the Magnus Opus of Pearl research written by Matthew Oates in March 2003, Butterfly Conservation Report SO3-12, and would recommend this work to provide a wider understanding than the scope allowed in this article. Comparisons and correlation of our research seem entirely appropriate, repetition unnecessary, though conclusions are left open for later discussion.

The dynamic nature and vegetation of Matthew's study area and those at Grovely are vastly different than can be experienced in the New Forest. My report on Grovely Wood, in 2010, detailed the soil types, PH and base-rich fertility - which very much gives a Whoosh factor! - while highlighting the description of the vegetation cover and the imperative for annual habitat management to provide for continuity.

Having read my Report, I joined Wildlife Ranger Colin Elford for "A day in the Wood", on 6th August 2010. We looked at habitat patch along the old Roman Road and down Middle Hills, noting the remarkable dynamics and rapid successional growth. Colin was concerned by reference in my Report to Brachypodium sylvatium and its invasive and suppressive nature; was its spread and cover that bad? A range of other topics were discussed including stretching the budget, availability of contractors, task days and objectives, achievements and goals.
A typical New Forest Pearl habitat will very much be viable three years after colonization. Leave Grovely without habitat patch creation for three years, and Pearl will have gone simply because there would be no continuity of suitable habitat for the vital larval development. A day in Grovely with Gordon Mackie, on 16th May 2012, left me with no doubt as to this outcome. The breeding areas from just two years previously were almost unrecognisable, if I had not known precisely where they were. Pearl could use them, but most certainly not for larval development.
By virtue of his on-going habitat management objectives, Colin had created new scallops and breeding habitat patches, and is to be thanked and warmly congratulated on what he has achieved.
The acidic soils which dominate the New Forest are at there best when they are of a clayey type influenced by the Headon Beds, or fertility from other sources, maybe streamside/ditch catchments. Acidic sandy soils are generally less favourable, though banks, ride sides and tumbling terrains can provide adequate violet with basking litter, either bracken or leaf litter maybe with infant bramble or the like. A considerable gradation occurs on Ramnor Hill, from clayey soil at the bottom to an acidic medium containing stones at the top.

The vegetation cover of the New Forest bears no relation to the other two named areas, indeed the steep south/west facing slopes of the Bodmin Moor colonies, such as my favourite at Fellover Brake, near St. Breward , bear a closer relationship.

In the New Forest, the occurrence of Hair-grass (Deschampsia species) indicate a higher PH towards neutral, and a more favourable base-rich conditions. Some areas adjacent to Pearl colonies in the New Forest can be dominated by Molinia caerulea, the purple-moor grass, maybe interspersed with heather (Erica and Calluna) and bilberry, while other locations are dominated by rank Agrostis species, notably stolonifera. From Molinia, birch and Calluna, a sudden drop in the terrain, maybe adjacent to a stream/ditch, and here is Deschampsia species, violet and bugle and hopefully a suitable basking substrate.

Grass species, such as the frequently dominant Agrostis, or the very occasional Deschampsia, which grows in a clump of wavy grass stems, are not used for basking, even if violets are abundant. One could argue the spent blades of Molinia would provide far better basking opportunities, but lets not go there but leave Molinia to Chequered Skippers around Fort William. Grasses tend to be cold. Dead stems and fronds of bracken and leaf litter, such as oak and bramble, are the required basking substrate. Such a substrate will hold and reflect the suns heat. The larvae also hibernate below several layers of litter, three or four leaves deep, and follow a similar pattern when they retreat after a session of basking and feeding. Such litter needs to be dry, not waterlogged as it was, with too much frequency, in 2012.
In the New Forest, a bracken substrate is the most frequently used basking material, although in places, such as Cooks Corner, leaf litter can form a high percentage.

In the Summer 2012 issue of Butterfly, Martin Warren in his article "Some like it hot" (page 33) touched on the basking techniques of Fritillary butterflies and the temperatures attained. Martin describes larval temperatures of 32 degrees Centigrade. On the other hand, Matthew and I refer to air and ground temperatures, in the shade and on the basking substrate respectively. Immediately, one can sense there is a difference in the methodology, the criteria descriptions explain the vast difference in our respective temperatures, though there is a correlation, or synergy, between each criteria/method. The temperatures Matthew state are basking larvae, one reading taken when the larvae start to bask, and as Matthew says, sometimes in incipient bright conditions. The temperatures I state refer to active, feeding and basking, larvae. There is a correlation in the temperatures stated by Matthew and I to reflect the warming of the day and of the larvae, as the shaded air and basking substrate warm. This warming determines the mode of the larvae as it changes from basking, as a method to "warm up", to an active mode, feeding and basking sessions, before retreating.

Incipient brightness and improving weather were the base levels for Matthew. Such journeys in unpredictable weather and relatively cold conditions, be they inclined to incipient brightness, were beyond my budget at upwards of £15 for the 40 mile round trip. Unless the forecast was promising; I considered such economies were better deployed on the days of improving bright conditions, and always in the certain knowledge that a long, devoted slog lay ahead once the Pearl were on the wing. That said, I fully agree with and embrace the figures Matthew states. They are consistent with those I experienced under similar conditions.

Improving conditions from incipient brightness provide excellent opportunities to observe larvae, as they and the day warm. Larvae will bask for lengthy periods to attain a sufficient temperature in order to become active. If the weather holds good, larvae will feed, bask and eventually retreat. This is not an exact science, but an example of an improving day. The weather being fickle, some days fail to kick on, others splutter along and may restart, and on some days, the larvae can feed and retreat for the day by mid-morning. There have been mornings of ambient warmth when the larvae have chosen to feed without actually coming to the sunlit surface; favouring dappled conditions in preference to potentially frizzling conditions!

The likelihood of either of the last two examples occurring in 2012 does seem unlikely, except for late March and 16th April. The atrocious weather of April and early May 2012, resulted in catastrophic larval mortality, which will be discussed later.

Like Matthew, I deploy thermometers in the shade and on the basking material (substrate) at ground level. Here, though, my calculations are based on air and ground temperatures taken when 4th and 5th instar larvae have warmed up and have actually commenced to feed and bask. Invariably, I take a number of readings each research day.

The need to bask is essential. Larvae are not able to bask where the substrate is damp or wet, even if conditions have improved beyond incipient brightness the wet substrate is a deterrent. To be able to move around and feed, larvae need to have warmed-up, and early mornings which glow with ambient warmth are few and far between. Larvae bask to raise their temperature, and the figures Matthew states reflect that requirement. Matthew presents tables in his article, which are not reproduced here, except to say they are 3 to 6 degrees lower than those I observed for active larvae, but there is a correlation as the temperatures rise to enable larvae to be active. (MO shade 11 -14C tailoring off to 18; basking substrate 15-18 tailoring to 24 C). They differ from my own figures, and vastly differ from the actual larvae temperatures quoted in Martin's article. The figures I state are taken on a day with broken cloud and sunny periods, when the air temperature in the shade would be in the range 12 to 18 degrees Centigrade C, but typically 14 to 17 C.

Prolonged temperatures above 17 C would rapidly raise the basking substrate temperature if exposed to the full sun. Typically, my ground substrate (basking) temperatures for active, feeding and basking, larvae fall in the range low to mid twenties, ideally around 23 to 24 C, though even 20 C and lower were sufficient to enable some activity. The lower the temperature, would tend to extend the length of basking time between bouts of feeding.

Larvae feed and then bask for 3 ½ minutes or longer. Basking is an essential aid to digestion. If larvae are unable to bask, they do not feed and are unable to digest their food effectively. They eat the fresh leaves of violets, buds and flowers. Flower stalks, and the centre rib of eaten violet leaves, are giveaways.

Larva feeding on Dog Violet flowers, New Copse Inclosure (Paul Brock)

Temperatures of 26 degrees C and towards 27C, under broken conditions, could be tolerated. To the most part, larvae tend to shy away from frying and would move away. Larvae do not tolerate 28C or continuous lower temperatures, and would move away or retreat completely, depending on their feeding disposition. These temperatures refer to the temperature of the ground basking substrate subjected to the warmth of the sun, whether broken or dappled sunlight, and this criteria needs to be emphasised.

Dappled sunlight, often from a nearby tree or even a few twigs or vegetation, can frequently play an important role. This element is particularly crucial later in the spring and summer, when dappled sunlight can protect violets from desiccation.

One hears authorities on the subject state 5th instar larvae feeding for 3 minutes and basking for a similar time, though nearer 3 ½ minutes. These times do reflect my own observations, though it needs to be understood that such times prevail under good conditions. Feeding and especially basking times vary considerably when conditions drop towards the low scale of temperatures of the basking substrate, and this is expediential to the temperature, or fall in temperature, towards 17 or 18 C . Other factors may also prevail, such as the larvae moving to fresh violets. The amount of time that larvae feed, and bask, also differ with the development stage of the larvae. The less developed the larvae, the less time it feeds. This is a generalisation, and really refers to feeding bouts. A feeding session could be as little as 90 seconds for a one centimetre larvae, which wouldn't make much impression on a violet plant; a bit of a leaf or a flower bud, which are very tasty and crammed with protein. By contrast, the final instar, several times larger and measuring almost one inch (24mm), can make quite an impression on a violet plant.
My observations have been gathered strictly from research of larvae in the field in the New Forest. I cannot make comparisons with larvae bred in cages, and conditions may differ from say the south-west facing valley slopes above the river Camel at Fellover Brake or Bunnys Hill above the Cardinham Woods, both in Cornwall.

As can be seen, ground temperatures on the basking substrate determine the warmth of the larvae and hence ability to be active. Where the basking substrate drops below 19 degrees C, the larvae will need to bask for longer periods between feeding bouts and such basking could extend to beyond twenty minutes. Frequently, as in 2012, low temperatures or poor conditions, can cause the larvae to revert to basking mode and this may lead to abort and retreat.

The comparison of the three sets of temperatures reflects the considerable difference which exists between a larvae having emerged under improving conditions to bask and that of the larvae in active mode having attained optimum temperature. From these dissimilar temperatures, the explanation of larval demise becomes very evident, and it is easy to understand the catastrophic larval mortality which overtook the 2012 sett; arising as a consequence of the frightful weather which persisted for weeks on end, once the weather broke-down on 3rd April 2012.

A post-hibernation larvae has no chance to bask when the inclement weather does not relent and the basking substrate remains unremittingly wet. By the 2nd April, most larvae in the New Forest had developed well through their 4th instar stage, indeed, a good number were happily into their 5th and final instar stage. Tuesday 3rd April started bright but showers and then rain moved in during the afternoon. The unsettled weather dominated thereafter, with the heavens open on Monday 9th. The last dry, sunny day in April was Monday 16th, when a still healthy number of larvae were active and observed. Overnight rain on Tuesday 24th caused considerable flooding to Pearl larval habitat into Wednesday 25th , when I experienced the horrendous spectacle of witnessing an entire breeding colony being swept away to the Lymington reed beds. The channel of the Etherise was unable to cope with the amount of flood water and overspilled. The relentless torrent then slammed into the gravel track, spreading upstream the flood water swept across the larval habitat. With the breeding area submerged, the water swirled viciously around picking-up anything in its path. A truly horrible sight, as tears soaked my shirt, I realised this was the Nadir of all my Pearl experiences.

Normal larva

Rarer form, occurs in c.10% of larvae

Survivers – larvae (both images, Paul Brock)

The month of May started where April left-off, though Wednesday 2nd relented sufficiently to allow an hour or two of bright weather, in which time Keeper Cook and wife, Sue, joined me for a gander in New Copse (It was Jonathan's day off!). The previous day, 1st May, Pearl had emerged in Grovely Wood, where bright weather had shone on the righteous with more alacrity than east of Brockenhurst. The Bank-Holiday week-end 3rd to 7th May at least remained consistent; depressingly murky and damp!

Emergence, like the weather, was spasmodic until 25th May, when five consecutive warm, sunny days encouraged upwards of 50% emergence for the season. Emergence continued on and off until about 20th June, probably accounting for a further 5 -10% of the total emergence, with ovipositing on 25th June. The latest I can recall!

Though the highest count was 151, on 29th May, such was the spread of the emergence that one could extrapolate the true total figure was nearer 250; 151 represented 60%, compared to the highest count in the spectacular emergence of 2011 representing 75%.

Excluding the 14 hours of bright and sunny conditions on 16th April and 2nd May, in the woodlands east of Brockenhurst there were less than 10 hours of bright conditions over the 37 days between 4th April and 10th May. The first twenty or so Pearl to emerge, must have been close to pupation before the weather broke down in early April.

Egg-laying provided an endless source of fascination. The female having allowed her eggs to ripen for a day or two, during which time she would keep a low profile and tended to nectar early in the day, would frequently adopt a procedure of reasonable care when she started egg-laying. Eggs would carefully be laid singularly on or near violets, litter and twigs, and often on the underside of dead bracken stems close to violets. This procedure, or ritual, would frequently show a variation after the initial 20 to 35 eggs had been laid, slowly becoming a random scatter which would occasionally degenerate in to a care-free process where the eggs were jettisoned akin to cluster bombing. The female would invariably delay egg-laying beyond a day or two when it was raining, preferring a dry day especially with sun.

Eggs were occasionally deposited on peculiar material, including such plants as wood sage, and searches in the area of egg-laying would usually reveal an absence of violets.
One may see a blue haze of scattered violets and instantly think of larvae feeding. This concept is wrong, as nice as the image may appear. The term plentiful or abundant violets in association with larvae feeding in the New Forest, relates to an abundance of about 5% of the ground area, and where favourable towards 10% violets. The crucial element is in the context of the material and bare ground present. Indeed, bare ground or dominance of grass cover, or in one area where violets are very plentiful but sadly growing with ivy and grass, are not suitable and best avoided. Larvae would not be able to develop under such conditions; they need a basking structure! Typically in the New Forest, the structure would consist of 5%> violets, the basking substrate would be in the range of 30% to as high as 75% where bracken dominates, with other vegetation, such as grass and vascular plants, and all between small patches of bare ground. Thus we have small discrete pockets in which larvae can develop. Where there are a number of these habitat patches, we have a discrete colony and a healthy number of these colonies constitute the metapopulation in the core area of the New Forest.

As explained earlier, there is a considerable difference between the New Forest and that of the calcareous Grovely Wood and the Cirencester Woods, both in the vegetation and dynamics. The

New Forest has a proliferation of bracken, sometimes in quite dense stands, while Deschampsia and Brachypodium sylvaticum are relatively sparse and replaced by Molinia, which can be prevalent in places, and Agrostis species, which is frequently a problem. The small pockets, or a series of habitat patches utilized by Pearl larvae, to the most part have far more bracken present - bracken will in places form the entire structure of the basking substrate. A good example of this is the research area, surrounded by conifer. Though, of course, violets will be present, as will bare ground along with the occasional vascular plant and the odd bit of grass. The presence of grazing animals, such as deer but more pertinently rogue livestock, tends to create a higher percentage of grass, and therein lies the balancing act; a dilemma which influences the equilibrium of the vegetation cover and suitable habitat for the larvae.

Before the start of a Conservation sub-committee meeting, Dave Green and I enjoyed an animated conversation on the relative speed and distance of travel of Pearl larvae. Where violets are plentiful alongside the basking substrate, even 5th instar larvae may not need to move many inches. A foot or so where there are suitable pockets and multi-aspect humps, but in the New Forest this is unusual. Dave and I agreed on the speed to cover up to a yard, and this ranged between 8 to 15 seconds per foot, not bad for a critter just under an inch in length! A similar speed is achieved when the final instar goes for walkies to pupate. Though why they then decide to wander across the danger of a gravel track or grass ride, does strike me as a tad strange, especially as it always seems to be obliquely diagonal. Of the 3 Pearl larvae Paul Brock has observed in recent years, two were crossing the identical track to pupate. Larvae do seem intent to make their final journey their longest, and by some distance.

I could not leave this article without further reference to Dave Green. The Hampshire branch will notice and appreciate the immense contribution he made to this branch and to the cause of Lepidoptera, after he has left us in the months ahead. By which time he has hopefully settled himself cosily in the isolation of deepest Wales. One of my biggest regrets was that Dave was never branch Chairman. We will miss you, Dave. Thanks for being there and for everything you did. All the very best, Dave.

Violets may not always be plentiful or in the right position to facilitate basking; presence of basking substrate with supply of violets, or where grass dominates. How many times do larvae wander off , either some distance or in the wrong direction? Just one of many reasons why over 90% of larvae in the wild never make it through to grace our woodlands and valley slopes.
In Matthew's report of 2003, he discusses the effect of deer and the deer population. Possibly against my better judgement and the brick-bats I am likely to receive from the Foresters, I can but fully concur with Matthew. Deer are culled, by the Forest Keeper, in the New Forest, and the equilibrium seems about right in order to keep most people happy. Without the presence of deer, with their deer runs and bracken brashing, the habitat condition would gradually change. Certain conditions in and around bracken stands would no longer persist. The conservationist (butterfly) may argue 10% more deer would help, though they do eat the food plants of larvae and adult. The Forester may contend that 40% fewer would help his silviculture.

In the New Forest, a far greater menace is created by the livestock that infest the fenced enclosures. The dainty deer, with dainty feet and small bulk causes far less damage to the ground vegetation than ever the ponies and cattle. Having recorded Pearl along the broad main track in New Copse last May, on my return walk to the motor, the enormous bulk of four gert brown and white critters confronted me, with a leg at each corner and massive horns adorning their crowns, they spied me conspiratorially with the most convincing evil-intent. These critters are the vacuum cleaners of the woodlands and forest as they hoover-up all and everything. Earlier, I had encountered half-a-dozen ponies along a ride. The bulky girth of livestock, be they pony or cattle,

is also very considerable, especially when at rest; sorry Mrs Larvae!

Grass tends to tiller from the base, ask any groundsman or farmer. Mow or graze grass and the sward develops, which leads to a lawn. From experience, livestock in the Pearl enclosures are encountered most days. There method of grazing has a considerable impact on the vegetation, and in this respect livestock are a menace and positive hindrance to the Pearl-bordered Fritillary and Lepidoptera of the fenced woodlands. The Forest Keepers have what seems a fortnightly regime of driving them out. The miscreants find their way to a well used gate and wait for an obliging soul to leave the gate open. I am told that not all people shut the gates properly! Ten minutes of watching any livestock, but especially cattle, would convince even the unconvinced.

Bright improving mornings in early April are precious to those in pursuit of observing larvae of the Pearl-bordered Fritillary, and on this heartening morning of perfection I made my way stealthily along the patchwork of the study area. Having observed nibbling and a larvae or two, I reached a sizable mound next to a prosperous side ditch. At first sight, the violets around the mound showed signs of nibbling. After closer inspection of the mound, it soon became apparent that the considerable nibbling was sufficiently heavy to indicate this extent of damage was down to two or more ravenous larvae and probably 5th instar. Interesting!

Having settled myself prone on the generous mound, such was my concentration of the subject that I soon became totally absorbed in my observations of not one but two magnificent final instar larvae feeding and basking in frantic bursts. I must have laid there on this pleasant enough mound next to the brooding ditch for some forty minutes, totally oblivious to everything around and about me. Stella, the closest larvae to me, took it upon herself to retreat below the comfortable layers of bracken, and this action caused me to collect my senses; I wondered where my right foot had gone during the delightful distractions of the last half-hour. I need not have worried, yes, relief, there was my right lower limb, but immersed in the cold, murky ditch. Carefully retrieving the dangling limb, my boot, socks and trousers were soaked to well above the ankle. And think on. This is what we do in the cause of research! At first, I was not conscious of the distressing cold in the right extremity but quickly glad the motor was within a ten minute walk. Thanks to the Keepers, I have a Permit for Motoring in Inclosures. I felt I both needed and earned it if only for that encounter. How fortunate not to have a two mile walk.

The sun bounded out of the vibrant spring sky to greet the conspicuous green vehicle of a Forest Keeper, causing quite a stir among my terminally suspicious neighbours. The sparkling morning in April 2011 announced the arrival of Keeper Jonathan Cook who had come to collect me for a day with the Pearl colonies. Well, at least I was aware of the location of all the discrete colonies within the metapopulation. With Robert Colin-Stokes moved to the Forest of Dean and John Gulliver retired, gone with his treasured MBE for services to Nature Conservation in the New Forest, there existed a shortage of knowledge as to where such and such a colony were located. Lead Butterfly Keeper, Jonathan Cook, and Keepers Alan Stride and Patrick Cook, were all aware there was X in Y, they needed to know where X was on the ground.

At the time, I had a nasty leg injury and had problems hobbling, yet alone walking. Which is why the Keepers needed to be fully armed with the correct information in order to effectively monitor Pearl on their beat. Jonathan knew where his own colonies were, which we visited after the grand tour north of the rail-line. So we duly trundled around Parkhill with its satellites and over to Perrywood Hazeley and Woodfidley. Approaching the research area, I instructed Jonathan along unsung rides. Having arrived as close as we could get, I pointed the way, and off they went. A steep bank presented a problem for me, so I watched intently with a keen ear and presently sensed my colleagues were somewhat perplexed by what confronted them. With a little help, and much

merriment, and crawling on my hands and knees, I struggled up the bank and tottered a few yards to join the flummoxed keepers. My own beat Keeper, Patrick, asked me what was going on. Reconciling the strange evidence of what was around us to a thriving breeding area for Pearl was a challenge met face on. We had a constructive discourse interspersed with Jonathan's customary banter and incisive observations as proposals to remove some of the shade causing pine were discussed.

Later, in August, we had three days looking at and appropriately marking the winter tasks which included forty pine trees adjacent to the ditch. The pine trees were subsequently felled; some of the trees showed early signs of the disease, red band needle blight. After clearance, an immense layer of brash remained and by late March it fell to me to spend some 40 hours raking and removing the detritus. So I can testify to the sun-trap created, which must have been a salvation to the developing larvae.

Over a decade has flown-by since I embraced a commitment to pursue all things P-bF in the main core area of the New Forest.

Underside (Paul Brock)

At the start of 2013, I have the opportunity to look back to those early days. I clearly remember how self-assured I was of the knowledge I could bring to the table. What Knowledge? With the hindsight of an accumulated wealth of knowledge and experience garnered in recent years, the question What Knowledge? appears entirely apposite. I knew nothing of real worth, and frankly admit this having spent the last decade being obsequiously anti-social by reason of a solitary pursuit in the isolation of a forest. Yes, I could identify P-bF, as I could other butterflies of the south country, and I knew when they were on the wing and habitat types, chalk downland, woodlands, heath, but recognise now that I had but a rudimentary grasp of profound detail. Back in those formative days, communication with the Keepers followed a protocol of tentative conversations with the aim of a mutual exchange fuelled by the records I could supply. Today, the relationship with the Forest Keepers is one of a harmonious rapport based on mutual respect and trust.

A tentative look forward to 2013 and beyond. Butterflies are resilient creatures. The weather has thrown everything at us, and we can but hope for a resurgence in fortunes. The recovery in Pearl numbers is an uphill struggle from a low figure, so it's steady at that and given better weather than experienced in 2012, the numbers can slowly build. In 2012, England experienced its wettest year on record, yet at the end of March we were in drought conditions. Dry, cold conditions, and a covering of snow isn't at all bad, are far more advantageous than the inclement wet but reasonably mild weather of this mid-winter. So optimism really is dampened!

Having visited breeding Pearl locations in recent days, I am not imbued with confidence from what I witnessed. Several locations were severely waterlogged, and everything horribly soaked and rank. It is inconceivable that larvae at a location near Lyndhurst will survive. Though ovipositing in a more favourable habitat patch at this site could well persist to perpetuate the species at this satellite, but that might be blind optimism rather than the face of reality.
The experiences garnered from the majority of the locations within the metapopulation have provided inspiration, magical moments and furnished that essential open-air classroom element. My fondness for New Copse, with its various matrix of habitat patches, continuity and transition, the delightful wide broad rides and not least the spectacular highlight of 2004, are priceless and precious experiences. They have formed an integral part in the total experience, but it is the whole of the many intricate and discrete parts which have formed this classroom. The working classroom would not be complete without the research area, which though it has lost its vigour and much of its character, the true character, the countless golden moments and sense of purpose will remain etched in memory, not lingering but vivid and rich, just as it enriched my life, education and understanding of this iconic butterfly. This "blessed ditch of happy memories" has provided more than a source of knowledge, it has enabled a communication and profound experience with nature so elemental to have dominated my life, at least for a few tiring weeks each year, in this great University of magical and golden memories, of Days with the Pearl in the New Forest.

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In recent years, countless experiences and observations have broadened my knowledge and understanding of this delicate and iconic creature, yet my enthusiasm to be in the field with the

Pearl remains undiminished. In the increasingly passive years ahead of me, I will draw on these golden memories content that my enchantment for the Pearl-bordered Fritillary will stay with me throughout those years. Thank you for the days, those endless Golden Pearl Days, those sacred days you gave me.

Not all survive! Pearl-bordered Fritillary attacked by Southern Wood Ants at New Copse Inclosure (John Ruppersbery)